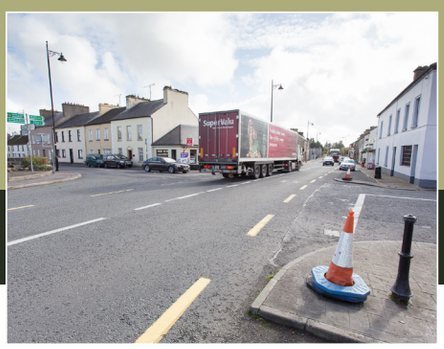
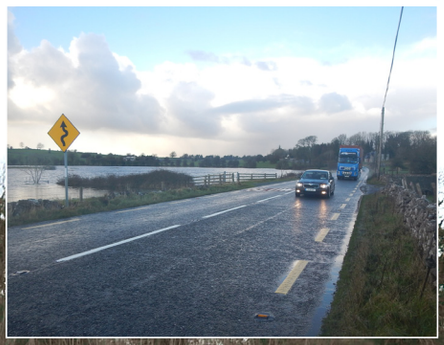
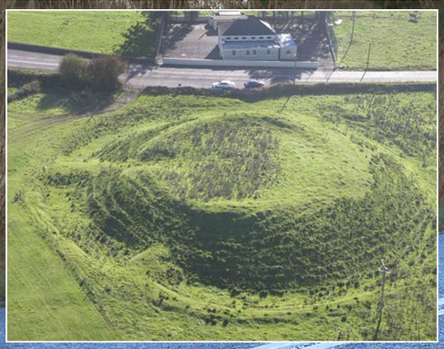
N5 Ballaghaderreen to Scramoge Road Project
Natura Impact Statement

DECEMBER 2017







An Roinn Iompair Túrasóireachta agus Spóirt
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N5 Ballaghaderreen to Scramoge Road Project

Natura Impact Statement

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1. INTRODUCTION

1.1 General Introduction

McCarthy Keville O'Sullivan Ltd. has been appointed to prepare an Appropriate Assessment (AA Screening Report and subsequent Natura Impact Statement) to provide the information necessary to allow the competent authority to conduct an Article 6(3) Appropriate Assessment of the proposed development in accordance with Article 6(3) of the EU Habitats Directive (Directive 92/43/EEC) the Planning and Development Act 2000 (as amended); and the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477/2011)..

This is a national road project which is not directly connected with or necessary for the management of any European Site.

Screening for Appropriate Assessment is required under Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (the Habitats Directive). Where it cannot be objectively concluded that a project or plan, either alone or in combination with other projects or plans, is not likely to have significant effects on a European Site then same shall be subject to an appropriate assessment of its implications for the site in view of the site's conservation objectives. The project has been subject to the screening process and the Appropriate Assessment Screening Report is provided as Appendix 1.

This statement is based on a desk study and field surveys and utilizes data collected during 2014, 2015 and 2016. It specifically assesses the potential for the proposed road development to impact on European sites.

This report is a Natura Impact Statement (NIS), and has been prepared in accordance with the European Commission guidance document *Assessment of Plans and Projects Significantly affecting Natura 2000 Sites: Methodological Guidance on the provisions of Article 6(3) and 6(4) of the Habitats Directive 92/43/EEC* (EC, 2001) and the Department of the Environment's Guidance on the Appropriate Assessment of Plans and Projects in Ireland (December 2009, amended February 2010).

In addition to the guidelines referenced above, the following relevant guidance was considered in preparation of this report:

(1) DoEHLG (2010) Appropriate Assessment of Plans and Projects in Ireland Guidance for Planning Authorities. Department of the Environment, Heritage and Local Government,

(2) European Communities (2000) Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC, Office for Official Publications of the European Communities, Luxembourg. European Commission,

(3) 92/43/EEC, Office for Official Publications of the European Communities, Luxembourg. European Commission,

(4) EC (2007) Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC – Clarification of the concepts of: alternative solutions, imperative reasons of overriding public interest, compensatory measures, overall coherence, opinion of the commission. European Commission,

(5) EC (2013) Interpretation Manual of European Union Habitats. Version EUR 28. European Commission,

(6) EPA (2002) Guidelines on the information to be contained in Environmental Impact Statements. Environmental Protection Agency,

(7) EPA (2003), Advice Notes on current practice in the preparation of Environmental Impact Statements. Environmental Protection Agency, and

(8) CIEEM (2016) Institute of Ecology and Environmental Management Guidelines for Ecological Impact Assessment.

(9) NRA (2009) Guidelines for Assessment of Ecological Impacts of National Roads Schemes – National Roads Authority, Dublin.

(10) EPA (2015) Guidelines on the information to be contained in Environmental Impact Statements (DRAFT) . Environmental Protection Agency,

(11) EPA (2015), Advice Notes for preparing Environmental Impact Statements (DRAFT). Environmental Protection Agency.

2. DESCRIPTION OF PROJECT

2.1 Site Location

The proposed N5 Ballaghaderreen to Scramoge Road Project extends from the townland of Rathkeery (Grid Ref: E169065 N293002), located west of Frenchpark, to the townland of Scramoge, east of Strokestown (Grid Ref:196117 N279615), where the proposed route will tie into the existing N5. The proposed road development is presented in Figure 1.1.

The Proposed road development is approx. 33.4km long. It commences at the tie-in with the recently completed N5 Ballaghaderreen Bypass before passing to the south of the existing N5. The route passes south of Frenchpark where it crosses the R361 (Williamstown to Boyle) Regional Road. It crosses the N5 at Cashel Townland northwest of Bellanagare. It remains north of Bellanagare and Tulsk, crossing the N61 (Athlone to Boyle) road near Shankill Cross. It continues north of Clooncullaan Lough before crossing the R368 (Elphin to Strokestown) at Lugboy townland where it veers south running parallel to the R368 to bypass Strokestown to the north and east. It rejoins the existing N5 at Scramoge to the east of Strokestown.

2.2 Description of the Proposed Road Development

A description of the type of road that is proposed is provided below.

The proposed road has been designed as a Type 1 Single Carriageway Cross section with a carriageway width of 7.3m (3.65m per direction) and associated, hard shoulders, road verges and drainage ditches. The paved width is generally 12.3m with local widening to accommodate specific road features such as junctions, etc. The total width of the road including verges and associated features will be approximately 29 – 30m as a minimum where it is at grade with the local topography. However, over much of the route, the local topography is such that significant cut and fill will inevitably be required. This will extend the width of the road footprint considerably in some sections.

The principal elements of or associated with the proposed road development include the following:

- Approximately 33.4km of National Primary Road to Type 1 Single Carriageway standard;
- Approximately 15.4km of realignment of existing roads;
- Five roundabouts;
    - Frenchpark Roundabout (R361 south of Frenchpark);
    - N61 Roundabout (between Tulsk and Elphin);
    - Shankill Roundabout (N61/R369);
    - Strokestown Roundabout (LP-1405);
    - Kildalloge Roundabout (R368/LP-1405);
    - 26 at grade mainline 'T' junctions, of which 5 are staggered and 6 are ghost island;
- 3 road under bridges and 1 overbridge;
- 4 River bridges and 14 culverts;
- Approximately 190m of retaining walls at a number of locations;
- Provision of 8 accommodation underpasses, access roads and accesses;

- Associated earthworks including excavation of peat & unacceptable material, excavation of rock and disposal & recovery of unacceptable material;
- Temporary site compounds;
- Drainage works;
- Landscaping works;
- Utilities and Services Diversion Works including the diversion of high voltage electricity lines at 3 locations and the provision of associated support towers/ poles.
- Safety Barrier, Fencing, public lighting and Accommodation Works;
- Environmental measures and all other Ancillary Works.

Much of the proposed road development is located in a Karst limestone area and as such there are relatively few watercourses with only five major watercourses identified along with a number of other minor watercourses and land drainage ditches that were small in size and highly modified from any natural origin. Any proposed road will cross these watercourses and the potential for impacts when crossing or working in close proximity has been taken into account in this Natura Impact Statement (NIS).

There are also a number of lakes, wetland areas and karst features within the zone of influence of the proposed road development and whilst the proposed road development will avoid or result in minimal impacts on these areas, the potential for resultant impacts has been considered. The potential for hydrological linkage with lakes and turloughs via karstic features has also been considered.

Drainage measures associated with a road of this type are likely to include both open and closed drains, infiltration ditches, swales, attenuation ponds and soakaways.

2.2.1 Baseline Ecology Environment

The complete description of the baseline environment including details of the desk study and detailed ecological survey methodologies and results are provided in Appendix 2 Ecology Chapter of EIAR.

The ecology of the Zone of Impact (ZoI) was first assessed in a desk study of ecological information that was pertinent to the route corridor. This was followed by a multi-disciplinary ecological walkover survey of the study area which incorporated habitat mapping and evaluation. The walkover surveys were undertaken on the 14th & 28th July 2014 and 31st October 2014. The walkover surveys were undertaken by Pat Roberts B.Sc. (Env.) MCIEEM and John Hynes B.Sc. (Env.) GradCIEEM with assistance from Laoise Kelly B.Sc. (Env.). All three surveyors have relevant academic qualifications and significant experience in undertaking habitat and ecological assessments to this level.

Habitats were identified in accordance with the Heritage Council's *'Guide to Habitats in Ireland'* (Fossitt, 2000). Habitat mapping was undertaken with regard to guidance set out in '*Best Practice* Guidance *for Habitat Survey and Mapping*' (Smith *et al*., 2011). Plant nomenclature for vascular plants follows '*New Flora of the British Isles*' (Stace, 2010), while mosses and liverworts nomenclature follows '*Mosses and Liverworts of Britain and Ireland - a field guide'* (British Bryological Society, 2010).

The walkover survey was designed to detect the presence, or likely presence, of a range of protected species. Habitats considered to be of ecological significance and

having the potential to correspond to those listed in Annex I of the EU Habitats Directive 92/43/EEC were identified as such during the walkover survey. The multi-disciplinary walkover survey comprehensively covered the entire length of the proposed road study corridor. Following desk studies and multidisciplinary walkover surveys, Zones of Impact (ZOI) for individual ecological receptors were assigned.

The "likely zone of impact" of a plan or project is the geographic extent over which significant ecological effects are likely to occur. In the case of **plans**, this zone can extend to a distance of 15km in all directions from the boundary of plan area. In the case of **projects**, however, the guidance recognises that the likely zone of impact must be established on a case-by-case basis, with reference to the following key variables:

- *The nature, size and location of the project;*
- *The sensitivities of the ecological receptors; and,*
- *The potential for cumulative effects.*

For example, in the case of a project that could affect a watercourse, it may be necessary to include the entire upstream and/or downstream catchment in order to capture all Natura 2000 sites with water-dependent Qualifying Interests. Taking into account the key variables outlined above, the likely zone of impact for the Project was defined following the rationale outlined below:

- Following the precautionary principle, European Sites within a 15km radius of the proposed road development were included within the ZOI and were considered in the AA Screening Assessment;
- European Sites outside a 15km radius with identifiable downstream connectivity via surface water were included within the ZOI (with the exception of sites that, following specialist hydrological advice, were separated by distance and buffered by lakes and other features to the extent that there was no potential for significant impacts to arise).
- The potential for the proposed road development to impact on European Sites outside a 15km radius but with no hydrological connectivity was also considered. No such potential was identified and no such sites were included within the ZOI.

Where necessary, surveys were undertaken outside the study corridor to adequately assess the potential impacts on individual receptors based on their individual identified ZOIs. The area surveyed to comprehensively assess the impacts on any receptor is hereafter referred to as the 'study area' and is based on the individual requirement for assessment of each ecological receptor based on the identified ZOI. In some cases, the ZOI for a particular receptor expanded or contracted during the course of the assessment, based on the findings of the surveys undertaken.

3. SUMMARY OF APPROPRIATE ASSESSMENT SCREENING

The Appropriate Assessment Screening Report completed in relation to the proposed road development is provided as Appendix 1.

3.1 Background to European Sites

3.1.1 European Sites

The EU Habitats Directive (92/43/EEC) provides the EU legislative framework of protecting rare and endangered species of flora and fauna, and habitats. This legislation requires the establishment and conservation of a network of sites of particular conservation value that are to be termed 'European Sites'.

Under the Habitats and Birds Directives as transposed into Irish Law, there are three principal types of European site, the Site of Community Importance (SCI), the Special Area of Conservation (SAC) and the Special Protection Area (SPA)[1]. The candidate forms of each of these are also included and are afforded the same legislative protection. These sites form part of "Natura 2000" a network of protected areas throughout the European Union. Natural Heritage Areas (NHAs) are heritage sites that were designated for the protection of flora, fauna, habitats and geological sites under the Wildlife (Amendment) Act 2000. These sites do not form part of the Natura 2000 network and the AA process, or screening for same, does not apply to NHAs.

Habitats Directive/Special Areas of Conservation

The EU Habitats Directive (92/43/EEC) provides the EU legislative framework of protecting rare and endangered species of flora and fauna, and habitats. Annex I of the Directive lists habitat types whose conservation requires the designation of Special Areas of Conservation (SAC). Priority habitats, such as Turloughs, which are in danger of disappearing within the EU territory, are also listed in Annex I. Annex II of the Directive lists animal and plant species (e.g. Marsh Fritillary, Atlantic salmon, and Killarney Fern) whose conservation also requires the designation of SAC. Annex IV lists animal and plant species in need of strict protection such as Lesser Horseshoe Bat and Otter, and Annex V lists animal and plant species whose taking in the wild and exploitation may be subject to management measures. In Ireland, species listed under Annex V include Irish Hare, Common Frog and Pine Marten.

Species can be listed in more than one Annex, as is the case with Otter and Lesser Horseshoe Bat which are listed on both Annex II and Annex IV.

Birds Directive/Special Protection Areas

Council Directive 79/409/EEC of 2 April 1979 on the conservation of wild birds (Birds Directive) has been substantially amended several times and was codified in 2009. It is now cited as Directive 2009/147/EC. The Directive requires Member States to take measures to maintain populations of all bird species naturally occurring in the wild state in the EU (Article 2). Such measures may include the maintenance and/or re-establishment of habitats in order to sustain these bird populations (Article 3).

A subset of bird species has been identified in the Directive and is listed in Annex I as requiring special conservation measures in relation to their habitats. These species have been listed on account of inter alia: their risk of extinction; vulnerability to specific changes in their habitat; and/or due to their relatively small population size or restricted distribution. Special Protection Areas (SPAs) are to be identified and

[1] See Section 177R of the Planning and Development Act, 2000. Note that SCIs represent the early stages of potential designation of areas as SACs.

classified for these Annex I listed species and for regularly occurring migratory species, paying particular attention to the protection of wetlands (Article 4).

3.2 European Sites in the Zone of Impact of the Proposed Road Development

Using the GIS software, MapInfo (Version 10.0), European sites within the zone of impact[2] of the project were identified. The following rationale was used to identify the Zone of impact. Initially, sites within a 15km radius of the proposed road development were identified (as per the DoEHLG Guidance (2010)). In addition, using the precautionary principle, European Sites located outside the 15km buffer zone were also taken into account and assessed where potential pathways for impact were identified and particularly where hydrological connectivity could be established. In this case, no potential for impacts on coastal or estuarine waters was identified.

All European sites located greater than 15km from the Proposed road development, with no identifiable connectivity (e.g. Lough Arrow SPA (004050) or located in a separate hydrological catchment i.e. Ballysadare (Water Framework Directive Catchment Mapping (WWW.watermaps.wfdireland.ie)) were deemed to be outside the Zone of impact of the proposed road development as no pathways for significant effects were identified.

In addition, European sites with hydrological connectivity, located downstream in the Shannon Catchment (i.e. River Shannon Callows SAC, Lough Derg North East Shore SAC, Lower River Shannon SAC, Middle Shannon Callows SPA, Lough Derg SPA) are considered to be sufficiently remote from the proposed development as not to be impacted either by construction activities or operation of the proposed road development (See Appendix A). The worst case scenario would be a major pollution incident towards the eastern end of the proposed development which would have to travel a distance in excess of 70km discharging through Kilglass Lough, Lough Boderg, Lough Bofin, Lough Forbes and Lough Ree before reaching any European Site. The buffering and dilution effect of these loughs will ensure imperceptible impact on European sites with identifiable hydrological connectivity but located outside the 15km buffer zone

Figures 3.1 shows the location of the proposed road development in relation to all European sites within the Zone of Impact as identified according to the criteria described above. These sites are all located downstream of the proposed road development.

Table 3.1 of the Appropriate Assessment Screening (Appendix 1), lists all European Sites that were considered to be within the Zone of Impact. The site synopses and conservation objectives of these sites, as per the NPWS website (www.npws.ie), were considered at the time of preparation of this report (13/06/2016). Details of these sites, including their distance from the proposed road development, are provided in Table 3.1 of Appendix 1.

3.3 Conclusions of Appropriate Assessment Screening Report

The following extract from the Appropriate Assessment Screening Report outlines the conclusions reached in the Screening Assessment.

[2] Zone of likely impact is a term used in DoEHLG (2010). Appropriate Assessment of Plans and Projects in Ireland. Guidance for Planning Authorities. Revision, February, 2010. Department of the Environment, Heritage and Local Government. Zone of Influence is used in NRA documentation and Guidelines

"In view of best scientific knowledge and on the basis of objective information, it is concluded that the proposed road development, whether individually or in combination with other plans or projects, beyond reasonable scientific doubt will not have significant effects on the following European Sites referred to in List 1:

List 1 European Sites

- *Callow Bog SAC (000595)*
- *Ballykenny-Fisherstown Bog SPA (004101)*
- *Brown Bog SAC (002346)*
- *Cloonchambers Bog SAC (000600)*
- *Clooneen Bog SAC (002348)*
- *Corbo Bog SAC (002349)*
- *Corrowbehy/Caher Bog SAC (000597)*
- *Derrinea Bog SAC (000604)*
- *Drumalough Bog SAC (002338)*
- *Flughany Bog SAC (000497)*
- *Lough Ree SAC (000440)*
- *Lough Ree SPA (004064)*
- *Moygollan Turlough SAC (000612)*
- *River Moy SAC (002298)*
- *Tullaghanrock Bog SAC (002354)*

It cannot be excluded beyond reasonable scientific doubt, in view of best scientific knowledge and on the basis of objective information that the proposed road development, individually or in combination with other plans and projects, would have a significant effect on the following European Sites referred to in List 2.

List 2 European Sites

- *Annaghmore Lough (Roscommon) SAC (001626)*
- *Bellanagare Bog SAC (000592)*
- *Bellanagare Bog SPA (004105) (004105)*
- *Cloonshanville Bog SAC (000614)*
- *Lough Forbes Complex SAC (001818)*
- *Lough Gara SPA (004048)*

As a result an appropriate assessment of the proposed road development is required and a Natura Impact Statement should be prepared in respect of the proposed development."

4. NATURA IMPACT ASSESSMENT

In light of the above this Natura Impact Statement (NIS) considers any adverse impacts that the proposed road development might have on the integrity of the following European Sites:

- Annaghmore Lough (Roscommon) SAC (001626)
- Bellanagare Bog SAC (000592)
- Bellanagare Bog SPA (004105)
- Cloonshanville Bog SAC (000614)
- Lough Forbes Complex SAC (001818)
- Lough Gara SPA (004048)

The site synopses for the screened-in designated sites are provided in Appendix 3. The conservation objectives documents can be sourced at www.npws.ie .

This Natura Impact Statement (NIS) comprises the scientific examination of proposed road development and the relevant European Sites, to identify and characterise any possible implications of the proposed development, individually or in combination with other plans or projects in view of the conservation objectives of the sites, and any further information including, but not limited to, any plans, maps or drawings, scientific information or data required to enable the carrying out of an Appropriate Assessment.

The methodology for the assessment of impacts is derived from the *Article 6(3) and (4) Guidance Document*. When describing changes/activities and impacts on ecosystem structure and function, the types of impacts that are commonly presented include;

- direct and indirect effects,
- short- and long-term effects,
- construction, operational and decommissioning effects, and
- isolated, interactive and cumulative effects.

Impacts that could potentially occur through the implementation of the project can be categorised under a number of impact categories as outlined in the EC *Article 6(3) and (4) Guidance Document* as follows:

- Loss/Reduction of habitat area,
- Disturbance to key species,
- Habitat or species fragmentation,
- Reduction in species density, and
- Changes in key indicators of conservation value such as decrease in water quality and quantity.

As per the EC, *Article 6(3) and (4) Guidance Document*, the meaning of integrity is defined as follows;

> *'The integrity of a 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' (MN2000, paragraph 4.6(3))'.*

Based on the objective information gathered and the predictions made about the changes that are likely to result from the construction and operation stages of the project, the Integrity of Site Checklist, as per Box 10 of the EC *Article 6(3) and (4) Guidance Document*, has been completed for each of the screened-in European sites.

The **precautionary principle** is detailed in Article 191 of the Treaty on the Functioning of the European Union (EU). It aims at ensuring a higher level of environmental protection through preventative decision-taking in the case of risk and underpins the Habitats Directive (DoEHLG 2010). The precautionary principle is the underlying concept of sustainable development which implies that prudent action be taken to protect the environment even in the absence of scientific certainty (DoEHLG 2010).

4.1 Annaghmore Lough (Roscommon) SAC (001626)

4.1.1 Identification of Pathways for Impacts

The screening assessment has identified potential pathways for the proposed road development to impact the Annaghmore Lough (Roscommon) SAC. Potential impacts on the QI may arise in the form of emissions to surface and ground waters and potential hydrological changes resulting from road construction and operation.

The generic conservation objective of this designated site is:

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

Table 4.1 identifies the QIs for which potential impact pathways for significant effects as a result of the proposed road development were identified.

Table 4.1 Assessment of Pathways for Impact on the Individual Qualifying Interests

Qualifying Interest	Assessment of Pathway for Effects
Alkaline fens [7230]	Potential impacts on the QI may arise in the form of emissions to surface and ground waters and potential hydrological changes resulting from road construction and operation. The potential for adverse effects on this habitat is considered further in this document.
Vetigo geyeri (Geyer's Whorl Snail) [1013]	Potential impacts on the supporting habitat of the QI may arise in the form of emissions to surface and ground waters and potential hydrological changes resulting from road construction and operation. The potential for adverse effects on this species is considered further in this document.

The identified impact pathway relates to the potential connectivity existing between the proposed road development and Cregga Turlough which is located approximately 650m to the east of Annaghmore Lough (Roscommon) SAC. Cregga Turlough and Annaghmore Lough SAC are likely to be hydrogeologically linked (see Appendix 4 Hydrogeology and Hydrology chapters of EIAR).

In addition, there is connectivity between Cregga Turlough and Annaghmore Lough via a pipe under the R368 and a drain leading to the Lough. Therefore a potential pathway for surface water connectivity between the proposed road and the SAC exists.

Alkaline Fens [7230]

Information on this habitat was obtained from NPWS (2013) *The Status of EU Protected Habitats and Species in Ireland* Habitat Assessments Volume 2. Version 1.1 Unpublished Report, National Parks & Wildlife Services. Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland. Hereafter referred to as the NPWS (2013).

The habitat account in that document reads as follows:

> *Alkaline fens are typically base-rich basin or flush fen systems with extensive areas of species-rich small sedge communities of the alliance Caricion davallianae. These fen systems are often a complex mosaic of habitats, with tall sedge beds, reedbeds, wet grasslands, springs and open-water often co-occurring at a given fen site. Alkaline fen habitat can occur beyond peat-forming fen systems, such as in dune slacks and wet grasslands. Based on a phytosociological description of small-sedge vegetation in Ireland, the associations Campylio-Caricetum dioicae, Schoenetum nigicantis and Juncetum subnodulosi correspond with 7230 Alkaline fens. The most extensive areas of alkaline fens in Ireland are thought to occur in lowland basins associated with limestone groundwater bodies with a karstic or poorly productive flow regime. Alkaline fens within flushes in upland and lowland regions, along the fringes of calcareous lakes and within turloughs, dune slacks and machair are thought to be more limited in extent but more widespread.*

The range of this habitat in Ireland has been assessed as favourable and the habitat area assessed as inadequate as per NPWS (2013).

The structures and function of the habitat is assessed as Bad (Trend: Unknown). The future prospects for the habitat are assessed as Bad (Trend: Improving).

On the basis of the above, the overall assessment of conservation status is Bad (Trend: Unknown). This represents an ongoing decline since 2007.

The pressures and threats (National level) relating to this habitat, as identified in NPWS (2013) are listed below:

Pressures:

- Water abstractions from groundwater (high importance)
- Reclamation of land from sea, estuary or marsh (high importance)
- Diffuse groundwater pollution due to agricultural and forestry activities (high importance)
- Abandonment of pastoral systems, lack of grazing (high importance)
- Water abstractions from surface waters (medium importance)
- Infilling of ditches, dykes, ponds, pools, marshes or pits (medium importance)
- Invasive non-native species (medium importance)
- Diffuse pollution to surface waters due to agricultural and forestry Activities (medium importance)
- Peat extraction (medium importance)
- Artificial planting on open ground (non-native trees) (medium importance)
- Agricultural intensification (medium importance)
- Restructuring agricultural land holding (low importance)

- Roads, motorways (low importance)
- Disposal of household / recreational facility waste (low importance)

Threats:

- Water abstractions from groundwater (high importance)
- Reclamation of land from sea, estuary or marsh (high importance)
- Diffuse groundwater pollution due to agricultural and forestry activities (high importance)
- Abandonment of pastoral systems, lack of grazing (high importance)
- Changes in abiotic conditions (medium importance)
- Water abstractions from surface waters (medium importance)
- Infilling of ditches, dykes, ponds, pools, marshes or pits (medium importance)
- Invasive non-native species (medium importance)
- Diffuse pollution to surface waters due to agricultural and forestry activities (medium Importance)
- Peat extraction (medium importance)
- Artificial planting on open ground (non-native trees) (medium importance)
- Agricultural intensification (medium importance)
- Restructuring agricultural land holding (low importance)
- Roads, motorways (low importance)
- Disposal of household / recreational facility waste (low importance)
- Disposal of inert materials (low importance)

No direct impacts on this habitat have been identified as the proposed road development is located entirely outside the European Site.

Potential pathways for indirect impacts on Alkaline Fens (7230) were identified at the screening stage in the form of emissions to surface and ground waters and hydrological changes resulting from road construction and drainage. These impacts are correlated with the national pressures and threats of *low importance*: Roads, motorways and Restructuring agricultural land holding. It is taken that the assignation of Low importance is consistent with there being few road projects that impact on Alkaline Fens and therefore at a national level these type of developments do not constitute a significant threat. In addition, the construction and operation of the road has potential to affect groundwater and may result in abstraction within the Annaghmore Lough catchment. This correlates to a national pressure and threat of *High importance.*

Whilst no detailed Conservation Objectives are available for Annaghmore Lough (Roscommon) SAC, targets and attributes for the conservation of this habitat are available in detailed Conservation Objectives Documents for other SACs. In relation to the current assessment, attributes and related targets for this habitat were taken from Galway Bay Complex SAC (000268) and are listed in Table 4.2 below. These targets and attributes are representative of factors considered in the conservation of Alkaline Fen habitat.

Table 4.2 Assessment of Attributes and Targets Associated with the Conservation of Alkaline Fen Habitat [7230]

Attribute	Target	Assessment
Habitat area	Area stable or increasing, Subject to natural processes	There will be no land take within 0.9km of the SAC and therefore there is no potential for direct loss of habitat as a result of the proposed road. Potential for indirect impacts on the fen in the form of alteration of the groundwater regime and water pollution during construction and operation were identified in the Screening assessment. These potential impacts have been fully assessed and where necessary, measures put in place to avoid them. The scientific assessments undertaken and measures that are in place to avoid any impacts are fully described in Section 10.4.13.1, 10.5.4.1 & 10.5.4.4 of Appendix 4 & Section 7.3 of Appendix 5 to this NIS. These Sections of the Appendices describe the potential for impacts on Cregga Turlough and the measures that are in place to avoid such impacts. This is the only pathway for impact on Annaghmore Lough and its associated fen. A summary of the main pollution control measures is provided in Section 4.7.
Habitat Distribution	No Decline, Subject to natural processes	There will be no decline in habitat area associated with the proposed road development for the same reasons as described above.
Hydrological regime	Appropriate natural hydrological regime necessary to support the natural structure and functioning of the habitat	Specific hydrological assessment has been undertaken where the road passes through the catchment of Annamore Lough and measures are in place to ensure that the hydrological regime of the wider area is not significantly affected. Furthermore, the design of the road and associated drainage has been developed to avoid any effect at all on Annaghmore Lough. The assessment of the hydrological impact of the road along with the specific design measures that are in place to avoid any effects on the hydrological regime of Annaghmore Lough are provided in Section 10.4.13.1, 10.5.4.1 & 10.5.4.4 of Appendix 4 & Section 7.3 of Appendix 5 to this NIS. These Sections of the Appendices describe the potential for impacts on Cregga Turlough and the measures that are in place to avoid such impacts. This is the only pathway for impact on Annaghmore Lough and its associated fen.
Peat Formation	Active peat formation, where appropriate	There will be no effect on peat formation as a result of the proposed road for the same reasons as described above. No direct or indirect impacts on the fens associated with Annaghmore Lough are predicted.
Water Quality: Nutrients	Appropriate water quality to support the natural structure and functioning of the habitat	Specific scientific assessment on the effects of the proposed road on water quality within the Annaghmore Lough catchment was undertaken and is described in the relevant Sections of Appendix 4 as referenced above. A series of measures have been prescribed following industry best practice and are in place to prevent any effect on water quality in the form of pollutants or nutrients during construction or operation.

Attribute	Target	Assessment
Vegetation Composition: typical species	Maintain vegetation cover of typical species including brown mosses and vascular plants	There will be no effect on vegetation composition as a result of the proposed road for the same reasons as described above. No direct or indirect impacts on the fens associated with Annaghmore Lough are predicted.
Vegetation Composition: Trees and Shrubs	Cover of scattered native trees not more than 10%	There will be no effect on vegetation composition as a result of the proposed road for the same reasons as described above. No direct or indirect impacts on the fens associated with Annaghmore Lough are predicted.
Physical structure: Percentage disturbed bare ground	Cover of disturbed bare ground not more than 10%. Where tufa is present, disturbed bare ground not more than 1%	There will be no effect on the physical structure of the habitat as a result of the proposed road for the same reasons as described above. No direct or indirect impacts on the fens associated with Annaghmore Lough are predicted.
Physical structure: Percentage drainage	Area showing signs of drainage as a result of drainage ditches or heavy trampling less than 10%	There will be no effect on the physical structure of the habitat as a result of the proposed road for the same reasons as described above. No direct or indirect impacts on the fens associated with Annaghmore Lough are predicted

The pathways that would allow any impacts on the alkaline fen habitat associated with Annaghmore Lough SAC to occur were considered in the design of the proposed road development and detailed scientific assessments of any potential impacts were undertaken. These include measures that ensure that imacts on Cregga Turlough are minimised and that there are no changes to the status and functioning of this feature. This is the only pathway for impact on Annaghmore Lough SAC and and its associated Alkaline Fen habitat (See Sections 10.4.13.1, 10.5.4.1 & 10.5.4.4 of Appendix 4 and Section 7.3 of Appendix 5). A range of measures that follow industry best practice, as outlined in Section 4.7 and in the Construction Erosion and Sediment Control Plan (Appendix 5), are in place to avoid pollution during both construction and operation.

Post implementation of avoidance and control measures there will not be any adverse effects on this qualifying interest of Annagnmore Lough SAC. The design of the proposed road development has been developed with an overall objective of minimising the impact on ecologically sensitive sites. Direct and indirect impacts on Alkaline Fen have been avoided (or are imperceptible) through the design and associated control measures.

Geyer's Whorl Snail (*Vertigo geyeri*) [1013]

Information on this species was obtained from the NPWS (2013). The species account in that document (*The Status of EU Protected Habitats and Species in Ireland.* Species Assessments, Volume 3. Version 1.0.) reads as follows:

> *Vertigo geyeri is one of 8 species of whorl snail (genus Vertigo) living in Ireland. The whorl snails are amongst the smallest of the country's land molluscs with a size ranging from 1.7 to 2.7mm in height and 1 to 1.5mm in width. Illustrations, descriptions and photographs can be found in Kerney & Cameron (1979), Pokryszko (1990) and on the Conchological Society web site (Buckle, 2012).All whorl snails favour damp or wet habitats, where they live mostly in moss, leaves and decaying vegetation. They feed on bacterial films and decaying vegetation.*

Vertigo geyeri is consistent in where it lives, within the saturated and decaying roots of small sedges (particularly Carex viridula ssp. brachyrrhyncha), associated fen mosses (particularly Drepanocladus revolvens and Campyllium stellatum). It is stringent in its requirement of saturated water conditions in calcareous, ground water fed flushes. This microhabitat is generally found in mosaics of suitable patches that are often limited in size to a few metres square within wider fen macro-habitats, which in Ireland can themselves fall within wider site habitats as diverse as raised bog laggs, transition mires, lake shores, hill or mountain slopes, and wetlands associated with coastal dunes and machair (Moorkens & Killeen 2011). It requires an openness of habitat that prevents succession by shade loving plants and more competitive shade loving snails. There is a general requirement for stable conditions and Vertigo geyeri is particularly sensitive to changes in hydrology. Within its macro-habitat, V.geyeri needs constancy of hydrological conditions, but with enough variation to provide refugia for the meteorological extremes that the habitat must endure. This species is hermaphrodite but may often be self-fertilising with some cross fertilisation (Pokryszko, 1987). One to ten uncalcified, separated eggs are produced which have a 2 week development period (Falkner et al. 2001). The main reproductive period may vary considerably from site to site and depending upon meteorological conditions. At some sites the main period appears to be March/April and the species reaches sexual maturity in less than a year, with maximum numbers of adults observed in the autumn (September/October) (Cameron et al. 2003). However, at a site in Anglesey Sharland (2000) found that there was an extended and variable breeding season with no clear annual cycle. Individuals may live for somewhat more than a year, but less than two years. Population densities seem frequently to be low, but up to 200 individuals/m² have been recorded (Killeen 2003). Dispersal mechanisms are uncertain, but hypotheses include transport by charadriiform birds and/or grazing animals (including wild ungulates), dependent upon circumstance (Cameron et al. 2003). The ability of the species to self-fertilise makes it possible for a single coloniser to establish a new population. Vertigo geyeri is considered to be under threat in Ireland. It was assessed as Vulnerable on the Irish Red List (Byrne et al. 2009), However in Europe the assessment in the latest Red List was Least Concern (Cuttelod et al. 2011).

The range and population for this species in Ireland has been assessed as Inadequate (Trend: declining) as per NPWS (2013).

The habitat for the species has been assessed as Inadequate (Trend: stable) and future prospects for the species have been assessed as Inadequate (Trend: declining).

On the basis of the above, the overall assessment of conservation status is Inadequate (Trend: declining). This represents an ongoing decline since 2007.

The pressures and threats (National level) relating to this species, as identified in the NPWS 2013, are listed below:

Pressures:

- Abandonment of pastoral systems, lack of grazing (high importance).
- Intensive grazing (medium importance).
- Water abstractions from groundwater (medium importance).
- Surface water abstractions for public water supply (low importance).

Threats:

- Abandonment of pastoral systems, lack of grazing (high importance).
- Intensive grazing (medium importance).
- Water abstractions from groundwater (medium importance).
- Surface water abstractions for public water supply (low importance).
- Roads, motorways (low importance)

No direct impacts on this species have been identified as the proposed road development is located entirely outside the European Site.

Potential pathways for indirect impacts on Geyer's Whorl Snail (*Vertigo geyeri)* [1013] were identified at the screening stage in the form of emissions to surface and ground waters and hydrological changes resulting from road construction and drainage. These impacts are correlated with the national pressure and threat of *low importance*: Roads, motorways. In addition, the construction and operation of the road has potential to affect groundwater and may result in abstraction within the Annaghmore Lough catchment. This correlates to a national pressure and threat of *medium importance.*

Whilst no detailed Conservation Objectives are available for Annaghmore Lough (Roscommon) SAC, targets and attributes for the conservation of this species are available in the detailed Conservation Objectives Document for Ballyness Bay SAC (001090). These targets and attributes are representative of factors considered in the conservation of Geyer's Whorl Snail but are specific Ballyness Bay SAC. The only transferrable Attribute and Target is assessed in Table 4.3 below.

Table 4.3 Assessment of Attributes and Targets Associated with the Conservation of *Vertigo geyeri* [1013]

Attribute	Target	Assessment
Distribution: occupied sites	No decline	There will be no land take within 0.9km of the SAC and therefore there is no potential for direct loss of habitat for the species as a result of the proposed road. Potential for indirect impacts on the distribution of the species in the form of alteration of the groundwater regime and water pollution during construction and operation were identified in the Screening assessment. These potential impacts have been fully assessed and where necessary, measures put in place to avoid them. The scientific assessments undertaken and measures that are in place to avoid any impacts are fully described in Sections 10.4.13.1, 10.5.4.1 & 10.5.4.4 of Appendix 4 & Section 7.3 of Appendix 5 to this NIS. A summary of the main pollution control measures is provided in Section 4.7.

The pathways that would allow any effects on Geyer's Whorl Snail or its habitat within Annaghmore Lough SAC to occur were considered in the design of the proposed road development and detailed scientific assessments of any potential impacts were undertaken (See Sections 10.4.13.1, 10.5.4.1 & 10.5.4.4 of Appendix 4 & Section 7.3 of Appendix 5). A range of measures that follow industry best practice, as outlined in Section 4.7 and in the Construction Erosion and Sediment Control Plan (Appendix 5), are in place to avoid pollution during both construction and operation.

Post implementation of avoidance and control measures the residual impact on *Vertigo geyeri* will be imperceptible. The design of the proposed road development has been developed with an overall objective of minimising the impact on ecologically sensitive sites. Direct and indirect impacts on *Vertigo geyeri* and supporting habitat have been avoided (or are negligible) through the design and associated control measures.

All aspects of the proposed road development which can, by themselves or in combination with other plans or projects, affect the site's conservation objectives have been identified in the light of the best scientific knowledge in the field. The implications for the European Site of the proposed road development, taking account of cumulative effects which result from the combination with other plans and projects, in view of the site's conservation objectives have been assessed.

In light of the Annaghmore Lough (Roscommon) SAC's conservation objectives, the proposed development will not adversely affect the integrity of the site concerned and no reasonable scientific doubt remains as to the absence of such effects.

4.2 Bellanagare Bog SAC (000592)

4.2.1 Identification of Pathways for Impacts

The screening assessment has identified potential pathways for the proposed road development to impact the Bellanagare Bog SAC. Potential impacts on the QIs may arise in the form of potential hydrological changes (drainage) resulting from the construction of the proposed road development (see Appendix 4 Hydrogeology and Hydrology).

The QIs and the associated detailed conservation objectives of the site are outlined in Table 4.4 below.

Table 4.4 Detailed Conservation Objectives

Qualifying Interest	Detailed Conservation Objective
Active Raised Bog [7110]	To restore the favourable conservation condition of Active raised bogs in Bellanagare Bog SAC, which is defined by the attributes and targets listed in table 4.7 below
Degraded raised bogs still capable of natural regeneration [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 Bellanagare Bog SAC.
Depressions on peat substrates of the Rhynchosporion [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 Bellanagare Bog SAC.

Table 4.5 identifies the QIs for which potential impact pathways for significant effects as a result of the proposed road development were identified.

Table 4.5 Assessment of Pathways for Impact on the Individual Qualifying Interests of Bellanagare Bog SAC

Qualifying Interest	Assessment of Pathway for Effects
Active raised bogs [7110]	Potential impacts on the QIs may arise in the form of hydrological changes resulting from road construction and operation. The potential for proposed road development to result in adverse effects on these habitats is considered further in this document.
Degraded raised bogs still capable of natural regeneration [7120]	
Depressions on peat substrates of the Rhynchosporion [7150]	

Active Raised Bogs* [7110]

Information on this habitat was obtained from the NPWS (2013). The species account in that document (*The Status of EU Protected Habitats and Species in Ireland. Habitats* Assessments Volume 2. Version 1.1.) reads as follows:

> *Raised bogs are accumulations of deep acid peat (3-12m) that originated in shallow lake basins or topographic depressions. They have a typical elevated surface or dome, which develops as raised bogs grow upwards from the surface (Fossit, 2000). The bog dome is primarily rainwater fed (ombrotrophic mire) and isolated from the local groundwater table. This gives rise to acidic conditions deficient in plant nutrients and in turn supports a distinctive suite of vegetation types, which although low in overall diversity, support specialised plant assemblages dominated by a range of mosses of the genus Sphagnum. The mire expanse may support a patterned micro-topography of pools, hummocks and lawns that provide a range of water regimes supporting different species assemblages. Intact raised bogs are characterised by the presence of ericoid and Cyperaceae species and an abundance of Sphagnum species. However, although Degraded Raised Bog may contain a similar species selection to Active Raised Bog, the relative abundance of individual species is different, with a lower cover of Sphagnum spp. Irish raised bogs are classified as Oceanic raised bog mire (sensu Moore & Bellamy, 1974). This mire type has a very restricted distribution on the Atlantic fringe of the north-west of Europe. The vegetation of a typical raised bog that is still hydrologically intact is assigned to the Oxycocco-Sphagnetea and to the Erico-Sphagnetum magellanici phytosociological association (White and Doyle, 1982). Raised bogs are more abundant in the lowlands of central and mid-west Ireland and are confined to areas with an annual rainfall below 1,250 mm (Hammond, 1984). They occur principally in land below 130m. Irish raised bogs are classified into two sub-types: Western (Intermediate) raised bogs or True Midland raised bogs (Schouten, 1984), with the boundary between the two being taken as the 1,000mm isohyet. Degraded Raised Bog is characterised by the complete absence, or at best the presence of only a patchy thin cover of an acrotelm layer. The acrotelm is the living, actively growing upper layer of a raised bog. The presence of the acrotelm is vital to the maintenance and development of an active raised bog as this is the peat forming layer and its presence strongly influences the rate of water runoff from the bog. Degraded Raised Bog, which the EU definition restricts to uncut high bog, in Ireland is considered to encompass sub-marginal, marginal and face bank ecotopes (Kelly (1993) and Kelly and Schouten (2002)) as well as inactive flushes and dry woodland on bog. Depressions on peat substrates of the Rhynchosporion (7150) are also found within Degraded Raised Bog habitat (7120). The official EU definition of the habitat (still capable of regeneration), indicates that the habitat can be restored to Active Raised Bog habitat (7110). If areas currently considered as degraded habitat cannot actually be restored then they do not qualify as habitat 7120. On the other hand degraded habitat is not*

considered to include areas of secondary degraded raised bog such as highly drained high bog devoid of vegetation and cutover bog. Although such areas do not correspond with the strict definition of Degraded Raised Bog within the Habitats Directive Interpretation Manual, the re-establishment of vegetation with peat forming capability in these areas may be possible. In some cases it may be even more feasible to restore some of these areas to active bog than some areas of what would be considered typical Degraded Raised Bog.

The range of this habitat in Ireland has been assessed as Bad (Qualifier: stable) and the habitat area assessed as Bad (Qualifier: declining) as per NPWS 2013.

The structures and function of the habitat is assessed as Bad (Qualifier: stable). The future prospects for the habitat are assessed as Bad (Qualifier: declining)

On the basis of the above, the overall assessment of conservation status is Bad (Qualifier: declining). This represents an ongoing decline since 2007.

The pressures and threats (National level) relating to this habitat, as identified in the NPWS (2013), are listed below:

Pressures:

- Water abstractions from groundwater (high importance)
- Peat extraction (high importance)
- Artificial planting on open ground (non-native tree) (medium importance)
- Fire and fire suppression (medium importance)
- Mining and quarrying (medium importance)
- Invasive non-native species (low importance)
- Problematic native species (low importance)
- Grazing (low importance)
- Motorised vehicles (low importance)

Threats:

- Water abstractions from groundwater (high importance)
- Peat extraction (high importance)
- Artificial planting on open ground (non-native trees) (medium importance)
- Fire and fire suppression (medium importance)
- Mining and quarrying (medium importance)
- Invasive non-native species (low importance)
- Problematic native species (low importance)
- Grazing (low importance)
- Motorised vehicles (low importance)

The assessment of the proposed road development has identified that the construction and operation of the road has potential to affect groundwater and may result in abstraction in the vicinity of Bellanagare Bog. This correlates to a national pressure and threat of *High importance.*

The targets and attributes for this habitat as per the specific conservation objectives for Bellanagare Bog SAC have been reviewed and considered in relation to the current development and are described in Table 4.6 below.

Table 4.6 Assessment of Attributes and Targets Associated with Site Specific Conservation Objectives for Active Raised Bogs [7110]

Attribute	Target	Assessment
Habitat area	Restore area of active raised bog to 139.1ha, subject to natural processes	There will be no land take within 0.2km of the SAC and therefore there is no potential for direct loss of habitat as a result of the proposed road. Potential for indirect impacts on the bog in the form of alteration of the groundwater regime and water pollution during construction and operation were identified in the Screening assessment. These potential impacts have been fully assessed and where necessary, measures put in place to avoid them. The scientific assessments undertaken and measures that are in place to avoid any impacts are fully described in Section 10,5.4.4 of Appendix 4 & Appendix 5 to this NIS. A summary of the main pollution and hydrological control measures is provided in Section 4.7. The proposed road project will in no way prevent the restoration of the area of active raised bog within the SAC.
Habitat distribution	Restore the distribution and variability of active raised bog across the SAC.	The proposed road development in no way prevents the restoration of the distribution and viability of active raised bog across the SAC for the same reasons as described above.
High Bog Area	No decline in extent of high bog necessary to support the development and maintenance of active raised bog.	The proposed road development will not result in any decline in the extent of high bog for the same reasons as described above.
Hydrological regime: water levels	Restore appropriate water levels throughout the site	The effects of the proposed road project on the hydrological regime within the catchment of Ballynagare bog SAC have been the subject of detailed scientific assessment. These assessments are provided in detail in Sections 10.4.13.1 and 10.5.4.4 of Appendix 4 to this document. Detailed and effective measures have been prescribed to ensure that the proposed road does not result in any hydrological impacts on the SAC either in terms of flow patterns or water levels. Details of the site specific measures that are in place to ensure that the proposed road does not result in effects on the hydrological functioning of Bellanagare Bog SAC are provided in Section 4.7.
Hydrological regime: flow patterns	Restore, where possible, appropriate high bog topography, flow directions and slopes	
Transitional areas between high bog and adjacent mineral soils (including cutover areas)	Restore adequate transitional areas to support/protect active raised bog and the services it provides	For the reasons set out above, 'there will be no impacts on transitional areas within the SAC boundary.

Attribute	Target	Assessment
Vegetation quality: central ecotope, active flush, soaks, bog woodland	Restore 69.6ha of central ecotope/active flush/soaks/bog woodland as appropriate	For the reasons set out above, 'there will be no impact on vegetation quality
Vegetation quality: microtopographical features	Restore adequate cover of high quality microtopographical features	For the reasons set out above, 'there will be no impact on vegetation quality
Vegetation quality: bog moss (Sphagnum) species	Restore adequate cover of bog moss (Sphagnum) species to ensure peat-forming capacity	For the reasons set out above, 'there will be no impact on vegetation quality
Typical Active Raised Bog (ARB)species: flora	Restore, where appropriate, typical active raised bog flora	For the reasons set out above, 'there will be no impact on ARB flora
Typical ARB species: fauna	Restore, where appropriate, typical active raised bog fauna	The proposed road development will be located over 200m from the SAC at its closest point and will be separated from it by existing forestry plantations, agricultural lands and turbary cutover. There will be no impact on ARB fauna
Elements of local distinctiveness	Maintain features of local distinctiveness, subject to natural processes	For the reasons set out above, 'there will be no impact on elements of local distinctiveness
Negative physical indicators	Negative physical features absent or insignificant	For the reasons set out above, there will be no increase on negative physical indicators.
Vegetation composition: native negative indicator species	Native negative indicator species at insignificant level	For the reasons set out above, there will be no impact on vegetation composition
Vegetation composition: non-native invasive species	Non-native invasive species at insignificant levels and not more than 1% cover	For the reasons set out above, there will be no impact on vegetation composition
Air quality: nitrogen deposition	Air quality surrounding bog close to natural reference conditions. The total N deposition should not exceed 5kg N/ha/yr	There will be no impact in relation to nitrogen deposition. The Bellanagare Bog SAC is located outside the 200m assessment zone TII/NRA. While a further assessment is not required for this development, in terms of air quality, one has been carried out due to the proximity to the SAC to the assessment zone. The assessment found that there would be no adverse impacts with regard to air quality.
Water quality	Water quality on the high bog and in transitional areas close to natural reference conditions	For the reasons set out above, there will be no impact of water quality associated with the peatland habitat.

No direct impacts on this habitat have been identified as the proposed road development is located entirely outside the European Site.

The pathways that would allow impacts on Active Raised Bog during construction and operation of the proposed road development to occur were fully assessed and considered in the design of the proposed road development. Specific design measures were put in place following a scientific assessment of the potential effects of the proposed development. These detailed and site specific measures are fully described in Sections 10.4.13.1 and 10.5.4.4 of Appendix 4 and also Section 4.7 below. Measures to ensure that the proposed road development does not result in effects on ground and surface waters are described in the Construction Erosion and Sediment Control Plan (Appendix 5.).

Post implementation of avoidance and control measures the residual impact on Active Raised Bog will be imperceptible. The design of the proposed road development has been developed with an overall objective of minimising the impact on ecologically sensitive sites. Direct and indirect impacts on Active Raised Bog, within Bellanagare Bog SAC, have been avoided through the design and associated control measures.

Degraded Raised Bogs Still Capable of Regeneration [7120]

Information on this habitat was obtained from the NPWS (2013). The species account in that document (*The Status of EU Protected Habitats and Species in Ireland. Habitats* Assessments Volume 2. Version 1.1.) reads as follows:

> *Raised bogs are accumulations of deep acid peat (3-12m) that originated in shallow lake basins or topographic depressions. They have a typical elevated surface or dome, which develops as raised bogs grow upwards from the surface (Fossit, 2000). The bog dome is primarily rainwater fed (ombrotrophic mire) and isolated from the local groundwater table. This gives rise to acidic conditions deficient in plant nutrients and in turn supports a distinctive suite of vegetation types, which although low in overall diversity, support specialised plant assemblages dominated by a range of mosses of the genus Sphagnum. The mire expanse may support a patterned micro-topography of pools, hummocks and lawns that provide a range of water regimes supporting different species assemblages. Intact raised bogs are characterised by the presence of ericoid and Cyperaceae species and an abundance of Sphagnum species. However, although Degraded Raised Bog may contain a similar species selection to Active Raised Bog, the relative abundance of individual species is different, with a lower cover of Sphagnum spp. Irish raised bogs are classified as Oceanic raised bog mire (sensu Moore & Bellamy, 1974). This mire type has a very restricted distribution on the Atlantic fringe of the north-west of Europe. The vegetation of a typical raised bog that is still hydrologically intact is assigned to the Oxycocco-Sphagnetea and to the Erico-Sphagnetum magellanici phytosociological association (White and Doyle, 1982). Raised bogs are more abundant in the lowlands of central and mid-west Ireland and are confined to areas with an annual rainfall below 1,250 mm (Hammond, 1984). They occur principally in land below 130m. Irish raised bogs are classified into two sub-types: Western (Intermediate) raised bogs or True Midland raised bogs (Schouten, 1984), with the boundary between the two being taken as the 1,000mm isohyet. Degraded Raised Bog is characterised by the complete absence, or at best the presence of only a patchy thin cover of an acrotelm layer. The acrotelm is the living, actively growing upper layer of a raised bog. The presence of the acrotelm is vital to the maintenance and development of an active raised bog as this is the peat forming layer and its presence strongly influences the rate of water runoff from the bog. Degraded Raised Bog, which the EU definition restricts to uncut high bog, in Ireland is considered to encompass sub-marginal, marginal and face bank ecotopes (Kelly (1993) and Kelly and Schouten (2002)) as well as inactive*

flushes and dry woodland on bog. Depressions on peat substrates of the Rhynchosporion (7150) are also found within Degraded Raised Bog habitat (7120). The official EU definition of the habitat (still capable of regeneration), indicates that the habitat can be restored to Active Raised Bog habitat (7110). If areas currently considered as degraded habitat cannot actually be restored then they do not qualify as habitat 7120. On the other hand degraded habitat is not considered to include areas of secondary degraded raised bog such as highly drained high bog devoid of vegetation and cutover bog. Although such areas do not correspond with the strict definition of Degraded Raised Bog within the Habitats Directive Interpretation Manual, the re-establishment of vegetation with peat forming capability in these areas may be possible. In some cases it may be even more feasible to restore some of these areas to active bog than some areas of what would be considered typical Degraded Raised Bog.

The range of this habitat in Ireland has been assessed as favourable and the habitat area assessed as Bad (Qualifier: declining) as per NPWS 2013.

The structures and function of the habitat is assessed as Bad (Qualifier: declining). The future prospects for the habitat are assessed as Bad (Qualifier: declining).

On the basis of the above, the overall assessment of conservation status is Bad (Qualifier: declining). This represents an ongoing decline since 2007.

The pressures and threats (National level) relating to this habitat, as identified in NPWS (2013), are listed below:

Pressures:

- Water abstractions from groundwater (high importance)
- Peat extraction (high importance)
- Artificial planting on open ground (non-native trees) (medium importance)
- Fire and fire suppression (medium importance)
- Mining and quarrying (medium importance)
- Invasive non-native species (low importance)
- Problematic native species (low importance)
- Grazing (low importance)
- Motorised vehicles (low importance)

Threats:

- Water abstractions from groundwater (high importance)
- Peat extraction (high importance)
- Artificial planting on open ground (non-native trees) (medium importance)
- Fire and fire suppression (medium importance)
- Mining and quarrying (medium importance)
- Invasive non-native species (low importance)
- Problematic native species (low importance)
- Grazing (low importance)
- Motorised vehicles (low importance)

The targets and attributes for this habitat as per the site specific conservation objectives are as above in relation to Active Raised bogs.

The assessment of the proposed road development has ruled out potential pathways for impacts on this habitat in relation to the above listed pressures and threats.

No direct impacts on this habitat have been identified as the proposed road development is located entirely outside the European Site.

The pathways that would allow indirect impacts on Degraded Raised Bog during construction and operation of the proposed road development to occur were fully assessed and considered in the design of the proposed road development. Specific design measures were put in place following a scientific assessment of the potential effects of the proposed development. These detailed and site specific measures are fully described in Sections 10.4.13.1 and 10.5.4.4 of Appendix 4 and also Section 4.7 below. Measures to ensure that the proposed road development does not result in effects on ground and surface waters are described in the Construction Erosion and Sediment Control Plan (Appendix 5).

Post implementation of avoidance, protection and control measures the residual impact on Degraded Raised Bog will be imperceptible. The design of the proposed road development has been developed with an overall objective of minimising the impact on ecologically sensitive sites. Direct and indirect impacts on Degraded Raised Bogs still capable of regeneration [7120], within Bellanagare Bog SAC, have been avoided through the design and associated control measures.

Depressions of Peat Substrates of the Rynchosporion [7150]

Information on this habitat was obtained from the NPWS (2013). The species account in that document (*The Status of EU Protected Habitats and Species in Ireland. Habitats* Assessments Volume 2. Version 1.1.) reads as follows:

> *Habitat 7150 in an Irish blanket bog context has been defined by Perrin et al. (2013a). This habitat consists of open vegetation on peat which is characterised by the abundance of Rhynchospora alba or Rhynchospor fusca. It can occur in both active and degraded blanket bogs and raised bogs on wet peat substrates on the margins of pools and hollows and also as a pioneer community in areas of disturbed peat such as peat-cuttings. It is typically a lowland community. Other typical species include Sphagnum spp., Drosera spp., Menyanthes trifoliata and Eriophorum angustifolium. The habitat is reported in Stallegger (2008) as occurring in the fluctuation zone of oligotrophic pools with sandy, slightly peaty substrates but it has not been recorded in this context in Ireland to date. It is also reported in Stallegger (2008) as occurring on wet heath but this has been recorded exceedingly rarely during the NSUH.*

The range of this habitat in Ireland has been assessed as favourable and the habitat area assessed as Inadequate (Qualifier: declining) as per NPWS 2013.

The structures and function of the habitat is assessed as Inadequate (Qualifier: declining). The future prospects for the habitat are assessed as Inadequate (Qualifier: declining).

On the basis of the above, the overall assessment of conservation status is Inadequate (Qualifier: declining). This represents an ongoing decline since 2007.

The pressures and threats (National level) relating to this habitat, as identified in NPWS (2013), are listed below:

Pressures:

- Non intensive sheep grazing (medium importance)
- Artificial planting on open ground (non-native trees) (high importance)
- Hand cutting of peat (medium importance)
- Mechanical removal of peat (high importance)
- Air pollution, air-borne pollutants (low importance)
- Invasive non-native species (low importance)
- Burning down (medium importance)
- Water abstractions from groundwater (high importance)
- Infilling of ditches, dykes, ponds, pools, marshes or pits (medium importance)
- Erosion (low importance)

Threats:

- Non intensive sheep grazing (medium importance)
- Artificial planting on open ground (non-native trees) (high importance)
- Hand cutting of peat (medium importance)
- Mechanical removal of peat (high importance)
- Air pollution, air-borne pollutants (low importance)
- Invasive non-native species (low importance)
- Burning down (medium importance)
- Water abstractions from groundwater (high importance)
- Infilling of ditches, dykes, ponds, pools, marshes or pits (medium importance)
- Erosion (low importance)
- Changes in abiotic conditions (low importance)
- Changes in biotic conditions (low importance)

The detailed Conservation Objectives that are available for Bellanagare Bog SAC (as per NPWS information 2015) are described below.

> *'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 Bellanagare Bog SAC.'*

The targets and attributes for this habitat, as per the specific conservation objectives, are as above in relation to Active Raised bogs.

The assessment of the proposed road development has not identified potential pathways for impacts on this habitat in relation to the above listed pressures and threats.

No direct impacts on this habitat have been identified as the proposed road development is located entirely outside the European Site.

The pathways that would allow impacts on Depressions of the Rynchosporion during construction and operation of the proposed road development to occur were fully assessed and considered in the design of the proposed road development. Specific design measures were put in place following a scientific assessment of the potential effects of the proposed development. These detailed and site specific measures are fully described in Sections 10.4.13.1 & 10.5.4.4 of Appendix 4 and also Section 4.7 below. Measures to ensure that the proposed road development does not result in effects on ground and surface waters are described in the Construction Erosion and Sediment Control Plan (Appendix 5).

Post implementation of avoidance and control measures the residual impact on Depressions of the Rynchosporion would be negligible. The design of the proposed road development has been developed with an overall objective of minimising the impact on ecologically sensitive sites. Direct and indirect impacts on Depressions of peat substrates of the Rynchosporion [7150], within Bellanagare Bog SAC, have been avoided through the design and associated control measures.

All aspects of the proposed road development which can, by themselves or in combination with other plans or projects, affect the site's conservation objectives have been identified in the light of the best scientific knowledge in the field. The implications for the European Site of the proposed road development, taking account of cumulative effects which result from the combination with other plans and projects, in view of the site's conservation objectives have been assessed.

In light of the Bellanagare Bog SAC's conservation objectives, the proposed development will not adversely affect the integrity of the site concerned and no reasonable scientific doubt remains as to the absence of such effects.

4.3 Cloonshanville Bog SAC (000614)

4.3.1 Identification of Pathways for Impacts

The screening assessment has identified potential pathways for the proposed road development to impact the Cloonshanville Bog SAC. Potential impacts on the QIs may arise in the form of emissions to surface and ground waters and potential hydrological changes resulting from road construction and operation.

The QIs and the detailed conservation objectives of the site are outlined in Table 4.7 below:

Table 4.7 Detailed Conservation Objectives

Qualifying Interest	Detailed Conservation Objective
Active Raised Bog [7110]	To restore the favourable conservation condition of Active raised bogs in Cloonshanville Bog SAC, which is defined by the attributes and targets listed in Table 4.9 below
Degraded raised bogs still capable of natural regeneration [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 Cloonshanville Bog SAC.
Depressions on peat substrates of the Rhynchosporion [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 Cloonshanville Bog SAC.

Qualifying Interest	Detailed Conservation Objective
Bog Woodland [91D0)	To maintain the favourable conservation condition of Bog woodland in Cloonshanville Bog SAC, which is defined by the list of attributes and targets outlined in the conservation objectives document.

Table 4.8 identifies the QIs for which potential impact pathways for significant effects as a result of the proposed road development were identified.

Table 4.8 Assessment of Pathways for Impact on the Individual QIs

Qualifying Interest	Assessment of Pathway for Effects
Active raised bogs [7110]	Potential pathways for indirect impacts on the Qualifying Interests were identified in the form of emissions to surface and ground waters and hydrological changes resulting from road construction and operation. The potential for adverse effects on these habitats is considered further in this document.
Degraded raised bogs still capable of natural regeneration [7120]	
Depressions on peat substrates of the Rhynchosporion [7150]	
Bog woodland [91D0]	

There is hydrological connectivity with the proposed road development via the Carricknabraher and Owennaforeesha Rivers, both of which are tributaries of the Breedoge River which passes along the eastern boundary of the SAC (see Appendix 4 Hydrogeology and Hydrology). The SAC may also be linked via groundwater given that "*A large flush area occurs in the centre of the bog dome*" (NPWS Site Synopsis).

Potential pathways for impact include the potential for changes to the hydrological regime within the area resulting from the construction of the road and continuing throughout its operation and the potential for negative impacts on surface water quality in the Owenfoorreesha and Carricknabraher Rivers.

Active Raised Bogs* [7110]

Information on this habitat was obtained from NPWS (2013). The habitat account including threats, pressures and 2013 conservation status assessment details are as identified in Section 4.2.1.

The assessment of the proposed road development has not identified potential pathways for impacts on this habitat in relation to the habitat specific pressures and threats as previously outlined above in Section 4.2.1.

The targets and attributes for this habitat as per the specific conservation objectives for Cloonshanville Bog SAC have been reviewed and considered in relation to the current development and are described in Table 4.9 below.

Table 4.9 Assessment of Attributes and Targets Associated with Site Specific Conservation Objectives for Active Raised Bogs [7110]

Attribute	Target	Assessment
Habitat area	Restore area of active raised bog to 44.0ha, subject to natural processes	There will be no land take within 1.7km of the SAC and therefore there is no potential for direct loss of habitat as a result of the proposed road. Potential for indirect impacts on the bog in the form of alteration of the groundwater regime and water pollution during construction and operation were identified in the Screening assessment. These potential impacts have been fully assessed and where necessary, measures put in place to avoid them. The scientific assessments undertaken and measures that are in place to avoid any impacts are fully described in Sections 10.4.13.1, 10.5.4.1 & 10.5.4.4 of Appendix 4 & Appendix 5 to this NIS. A summary of the main pollution and hydrological control measures is provided in Section 4.7. The proposed road project will in no way prevent the restoration of the area of active raised bog within the SAC.
Habitat distribution	Restore the distribution and variability of active raised bog across the SAC.	The proposed road development in no way prevents the restoration of the distribution and viability of active raised bog across the SAC for the same reasons as described above.
High Bog Area	No decline in extent of high bog necessary to support the development and maintenance of active raised bog.	The proposed road development will not result in any decline in the extent of high bog for the same reasons as described above
Hydrological regime: water levels	Restore appropriate water levels throughout the site	The effects of the proposed road project on the hydrological regime within the catchment of the SAC have been the subject of detailed scientific assessment. These assessments are provided in detail in Sections 10.4.13.1, 10.5.4.1 & 10.5.4.4 of Appendix 4 & Appendix 5 to this document. Detailed and effective measures have been prescribed to ensure that the proposed road does not result in any hydrological impacts on the SAC either in terms of flow patterns or water levels. Details of the site specific measures that are in place to ensure that the proposed road does not result in effects on the hydrological functioning of Bellanagare Bog SAC are provided in Section 4.7.
Hydrological regime: flow patterns	Restore, where possible, appropriate high bog topography, flow directions and slopes	
Transitional areas between high bog and adjacent mineral soils (including cutover areas)	Restore adequate transitional areas to support/protect active raised bog and the services it provides	For the reasons set out above, 'there will be no impacts on transitional areas within the SAC boundary.

Attribute	Target	Assessment
Vegetation quality: central ecotope, active flush, soaks, bog woodland	Restore 22.0ha of central ecotope/active flush / soaks / bog woodland as appropriate	For the reasons set out above, 'there will be no impact on vegetation quality
Vegetation quality: microtopographical features	Restore adequate cover of high quality microtopographical features	For the reasons set out above, 'there will be no impact on vegetation quality
Vegetation quality: bog moss (Sphagnum) species	Restore adequate cover of bog moss (Sphagnum) species to ensure peat-forming capacity	For the reasons set out above, 'there will be no impact on vegetation quality
Typical Active Raised Bog (ARB)species: flora	Restore, where appropriate, typical active raised bog flora	For the reasons set out above, 'there will be no impact on ARB flora
Typical ARB species: fauna	Restore, where appropriate, typical active raised bog fauna	The proposed road development will be located over 1.7km from the SAC at its closest point and will be separated from it by existing forestry plantations, agricultural lands roads. There will be no impact on ARB fauna
Elements of local distinctiveness	Maintain features of local distinctiveness, subject to natural processes	For the reasons set out above, 'there will be no impact on elements of local distinctiveness
Negative physical indicators	Negative physical features absent or insignificant	For the reasons set out above, 'there will be no increase on negative physical indicators.
Vegetation composition: native negative indicator species	Native negative indicator species at insignificant level	For the reasons set out above, 'there will be no impact on vegetation composition
Vegetation composition: non-native invasive species	Non-native invasive species at insignificant levels and not more than 1% cover	For the reasons set out above, 'there will be no impact on vegetation composition
Air quality: nitrogen deposition	Air quality surrounding bog close to natural reference conditions. The total N deposition should not exceed 5kg N/ha/yr	There will be no impact in relation to nitrogen deposition. The Cloonshanville Bog SAC is located outside the 200m assessment zone TII/NRA.
Water quality	Water quality on the high bog and in transitional areas close to natural reference conditions	For the reasons set out above, 'there will be no impact of water quality associated with the peatland habitat.

No direct impacts on this habitat have been identified as the proposed road development is located entirely outside the European Site.

The pathways that would allow impacts on Active Raised Bog during construction and operation of the proposed road development to occur were fully assessed and considered in the design of the proposed road development. Specific design measures were put in place following a scientific assessment of the potential effects of the proposed development. These detailed and site specific measures are fully described in Sections 10.4.13.1, 10.5.4.1 & 10.5.4.4 of Appendix 4 & Appendix 5 and also Section 4.7 below. Measures to ensure that the proposed road development

does not result in effects on ground and surface waters are described in the Construction Erosion and Sediment Control Plan (Appendix 5).

Post implementation of avoidance and control measures the residual impact on Active Raised Bog would be imperceptible. The design of the proposed road development has been developed with an overall objective of minimising the impact on ecologically sensitive sites. Direct and indirect impacts on Active Raised Bog, within Cloonshanville Bog SAC, have been avoided through the design and associated control measures.

Degraded Raised Bogs Still Capable of Regeneration [7120]

Information on this habitat was obtained from NPWS (2013). The habitat account including threats, pressures and 2013 conservation status assessment details are as identified in Section 4.2.1.

The assessment of the proposed road development has not identified potential pathways for impacts on this habitat in relation to the habitat specific pressures and threats as previously outlined above in Section 4.2.1.

The targets and attributes for this habitat are as above in relation to Active Raised bogs at Cloonshanville.

No direct impacts on this habitat have been identified as the proposed road development is located entirely outside the European Site.

The pathways that would allow impacts on Degraded Raised Bog during construction and operation of the proposed road development to occur were fully assessed and considered in the design of the proposed road development. Specific design measures were put in place following a scientific assessment of the potential effects of the proposed development. These detailed and site specific measures are fully described in Sections 10.4.13.1, 10.5.4.1 & 10.5.4.4 of Appendix 4 & Appendix 5 and also Section 4.7 below. Measures to ensure that the proposed road development does not result in effects on ground and surface waters are described in the Construction Erosion and Sediment Control Plan (Appendix 5).

Depressions of peat substrates of the Rynchosporion [7150]

Information on this habitat was obtained from NPWS (2013). The habitat account including threats, pressures and 2013 conservation status assessment details are as identified in Section 4.2.1.

The assessment of the proposed road development has not identified potential pathways for impacts on this habitat in relation to the habitat specific pressures and threats as previously outlined above in Section 4.2.1.

The targets and attributes for this habitat are as above in relation to Active Raised bogs at Cloonshanville.

No direct impacts on this habitat have been identified as the proposed road development is located entirely outside the European Site.

The pathways that would allow impacts on Cloonshanville Bog SAC during construction and operation of the proposed road development to occur were fully assessed and considered in the design of the proposed road development. Specific design measures were put in place following a scientific assessment of the potential

effects of the proposed development. These detailed and site specific measures are fully described in Sections 10.4.13.1, 10.5.4.1 & 10.5.4.4 of Appendix 4 & Appendix 5and also Section 4.7 below. Measures to ensure that the proposed road development does not result in effects on ground and surface waters are described in the Construction Erosion and Sediment Control Plan (Appendix 5).

Bog Woodland* [91D0]

Information on this habitat was obtained from the NPWS (2013). The species account in that document (*The Status of EU Protected Habitats and Species in Ireland. Habitats* Assessments Volume 2. Version 1.1.) reads as follows:

> *Bog woodland is a widespread but localised habitat type in Ireland. It occurs in 3 distinct habitats. 1) On raised bogs, where it is associated with weakly flushed sites on the high bog. 2) On cutaway bog, where it occurs in association with weak ground-water influence. 3) Within sessile oak woodlands in association with nutrient-poor flushes. Geographically, bog woodland is found mostly in the midlands, within the drumlin belt of the north midlands and in upland valleys. Bog woodlands are dominated by birch (Betula pubescens) with small amounts of willow (mostly Salix aurita or S. atrocinerea). Locally, there may be small amounts of Scots pine, especially on raised bogs. Generally, the field layer is poorly developed but the dwarf shrub layer may be well developed, especially on raised bogs, and the moss layer is well developed, often luxuriant and dominated by Sphagnum species*

The range of this habitat in Ireland has been assessed as Favourable and the habitat area assessed as Favourable as per (2013).

The structures and function of the habitat is assessed as Favourable. The future prospects for the habitat is assessed as Favourable

On the basis of the above, the overall assessment of conservation status is Favourable. The improved status change since 2007 is due to a change in habitat status interpretation.

The pressures and threats (National level) relating to this habitat, as identified in NPWS (2013) are listed below:

Pressures:

- Peat extraction (medium importance)
- Human induced changes in hydraulic conditions (medium importance)
- Invasive non-native species (low importance)
- Burning down (low importance)
- Intensive grazing (low importance)
- Grazing in forests/woodland (low importance)
- Problematic native species (low importance)
- Disposal of household/recreational facility waste (low importance)

Threats:

- Peat extraction (medium importance)
- Human induced changes in hydraulic conditions (medium importance)
- Invasive non-native species (low importance)

- Burning down (low importance)
- Intensive grazing (low importance)
- Grazing in forests/woodland (low importance)
- Problematic native species (low importance)
- Roads, motorways (low importance)
- Disposal of household/recreational facility waste (low importance)

The assessment of the proposed alignment has identified potential pathways for impacts on this habitat in relation to the above listed *low importance* threat: Roads, motorways and *medium importance* pressure and threat: Human induced changes in hydraulic conditions.

The targets and attributes for this habitat as per the specific conservation objectives for Cloonshanville Bog SAC have been reviewed and considered in relation to the current development and are described in Table 4.10 below.

Table 4.10 Assessment of Attributes and Targets Associated with Site Specific Conservation Objectives for Bog Woodland [91D0]

Attribute	Target	Assessment
Habitat area	Area stable or increasing, subject to natural processes.	There will be no land take within 1.7km of the SAC and therefore there is no potential for direct loss of habitat as a result of the proposed road. Potential for indirect impacts on the bog woodland in the form of alteration of the groundwater regime and water pollution during construction and operation were identified in the Screening assessment. These potential impacts have been fully assessed and where necessary, measures put in place to avoid them. The scientific assessments undertaken and measures that are in place to avoid any impacts are fully described in Sections 10.4.13.1, 10.5.4.1 & 10.5.4.4 of Appendix 4 & Appendix 5 to this NIS. A summary of the main pollution and hydrological control measures is provided in Section 4.7. The proposed road project will in no way effect the area of bog woodland habitat within Cloonshanville Bog SAC.
Habitat distribution	No decline, subject to natural processes	For the reasons stated above, there will be no decline in habitat distribution associated with the proposed road development
Vegetation composition: positive indicator species	Birch (Betula pubescens), bog moss (Sphagnum species) and at least five other species present	There will be no impact on vegetation composition
Vegetation composition: negative indicator species	Both native and non-native invasive species absent or under control. Total cover should be less than 10%	

Attribute	Target	Assessment
Woodland structure: cover and height of birch	A minimum 30% cover of birch (Betula pubescens) with a median canopy height of 4m	For the reasons stated above, there will be no impact on woodland structure
Woodland structure: dwarf shrub cover	Dwarf shrub cover not more than 50%	
Woodland structure: ling cover	Ling (Calluna vulgaris) cover not more than 40%	
Woodland structure: bryophyte cover	Bryophyte cover at least 50%, with bog moss (Sphagnum spp.) cover at least 25%	
Woodland structure: tree size classes	Each size class present	
Woodland structure: senescent and dead wood	Senescent or dead wood present	

No direct impacts on this habitat have been identified as the proposed road development is located entirely outside the European Site.

The pathways that would allow impacts on Bog Woodland during construction and operation of the proposed road development to occur were fully assessed and considered in the design of the proposed road development. Specific design measures were put in place following a scientific assessment of the potential effects of the proposed development. These detailed and site specific measures are fully described in Sections 10.4.13.1, 10.5.4.1 & 10.5.4.4 of Appendix 4 & Appendix 5 and also Section 4.7 below. Measures to ensure that the proposed road development does not result in effects on ground and surface waters are described in the Construction Erosion and Sediment Control Plan (Appendix 5).

All aspects of the proposed road development which can, by themselves or in combination with other plans or projects, affect the site's conservation objectives have been identified in the light of the best scientific knowledge in the field. The implications for the European Site of the proposed road development, taking account of cumulative effects which result from the combination with other plans and projects, in view of the site's conservation objectives have been assessed.

In light of the Cloonshanville Bog SAC's conservation objectives, the proposed development will not adversely affect the integrity of the site concerned and no reasonable scientific doubt remains as to the absence of such effects.

4.4 Lough Forbes Complex SAC (001818)

4.4.1 Identification of Pathways for Impacts

The screening assessment has identified potential pathways for the proposed road development to impact the Lough Forbes Complex SAC located approx. 30km to the north east. Potential impacts on some of the QIs may arise in the form of emissions to surface and ground waters, and potential hydrological changes resulting from road construction and operation.

The QIs and the associated detailed conservation objectives of the site are outlined in Table 4.11 below.

Table 4.11 Detailed Conservation Objectives

Qualifying Interest	Detailed Conservation Objective
Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation [3150]	To restore the favourable conservation condition of Natural eutrophic lakes with Magnopotamion or Hydrocharition-type vegetation in Lough Forbes Complex SAC
Active Raised Bog [7110]	To restore the favourable conservation condition of Active raised bogs in Lough Forbes Complex SAC
Degraded raised bogs still capable of natural regeneration [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 Forbes Complex SAC
Depressions on peat substrates of the Rhynchosporion [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 Lough Forbes Complex SAC
Alluvial forests with Alnus glutinosa and Fraxinus excelsir (Alno-pladion, Alnion incanae, Salicion albae) [91E0]	To restore the favourable conservation condition of Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) in Lough Forbes Complex SAC

The AA Screening document that is provided as Appendix 1 to this NIS, assesses the potential routes by which individual European Sites have the potential to be affected by the proposed road development. This document finds that the only pathway for effect is via emissions to surface and groundwater. Detailed scientific assessment of the potential effects these sites was completed during the design of the proposed road and pathways (or lack of) for effect on individual QIs were identified. Table 4.12 identifies the QIs for which potential impact pathways for adverse effects as a result of the proposed road development were identified.

Table 4.12 Determination of Presence of Pathways for Impact on the Individual QIs

Qualifying Interest	Assessment of Pathway for Effects
Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation [3150]	Potential impacts on the Qualifying Interest may arise in the form of hydrological changes resulting from an uncontrolled large spillage to the east of the proposed road development. The detailed assessment that led to this conclusion is provided in Sections 10.4.13.1, 10.5.4.1 & 10.5.4.4 of Appendix 4 & Appendix 5 this NIS. The potential for adverse effects on these habitats is considered further in this document.
Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) [91E0]	
Active raised bogs [7110]	These habitats within the SAC are not hydrologically linked to the proposed road development as the water regime governing this bog complex will not be affected by emissions or drainage effects from the road construction and operation. There is no potential for adverse effects on these habitats. The detailed assessment that led to this conclusion is provided in Sections 10.4.13.1, 10.5.4.1 & 10.5.4.4 of Appendix 4 & Appendix 5 to this NIS. They are not considered further in this document.
Degraded raised bogs still capable of natural regeneration [7120]	
Depressions on peat substrates of the Rhynchosporion [7150]	

There is hydrological connectivity with the proposed road development via watercourses traversed by the proposed road development, but the watercourse with the closest hydrological connectivity is the Scramoge River (>30km hydrologically) (see Appendix 4 Hydrogeology and Hydrology).

Alluvial Woodland [91E0]

Information on this habitat was obtained from the NPWS (2013). The species account in that document (*The Status of EU Protected Habitats and Species in Ireland. Habitats* Assessments Volume 2. Version 1.1.) reads as follows:

> *91E0 is a priority Annex I habitat. A number of variants of this woodland habitat exist, of which riparian forests of Fraxinus excelsior and Alnus glutinosa (Alno-Padion) of temperate and Boreal Europe lowland and hill watercourses are the most common type to be found in Ireland. The interpretation manual of EU habitats 2007 states that all types occur on heavy soils which are periodically inundated by the annual rise of river levels, but which are otherwise well drained and aerated during low water. The herbaceous layer includes many large species such as Filipendula ulmaria, Angelica sylvestris and Carex acutiformis, vernal species such as Ranunculus ficaria and Anemone nemorosa, and other indicative species such as Carex remota, Lycopus europaeus, Urtica dioica and Geum rivale are also listed.*
>
> *In addition there are gallery forests of tall willows (Salicion albae) alongside river channels and occasionally on river islands, where the tree roots are almost continuously submerged. They are dominated by Salix alba, S. viminalis and S.triandra, sometimes with S. cinerea but alder is relatively rare. There is a luxuriant herb layer of Phalaris arundinacea, Urtica dioica, Filipendula ulmaria, etc.*

The range of this habitat in Ireland has been assessed as favourable and the habitat area assessed as Bad (Qualifier: stable) as per NPWS (2013).

The structures and function of the habitat is assessed as Bad (Qualifier: Improving). The future prospects for the habitat are assessed as Bad (Qualifier: Improving).

On the basis of the above, the overall assessment of conservation status Bad (Qualifier: Improving. This represents a genuine improvement in conservation status since 2007.

The pressures and threats (National level) relating to this habitat, as identified in NPWS (2013), are listed below:

Pressures:

- Invasive non-native species (high importance)
- Problematic native species (medium importance)
- Garbage and solid waste (low importance)
- Grazing in forests/ woodland (low importance)

Threats:

- Invasive non-native species (high importance)
- Problematic native species (medium importance)
- Garbage and solid waste (low importance)

- Grazing in forests/ woodland (high importance)

The assessment of the proposed road development has not identified potential pathways for impacts on this habitat in relation to the above listed pressures and threats.

The targets and attributes for this habitat as per the specific conservation objectives for Lough Forbes Complex SAC have been reviewed and considered in relation to the current development and are described in Table 4.13 below.

Table 4.13 Targets and Attributes Associated with Site Specific Conservation Objectives for Alluvial Woodland [91E0]

Attribute	Target	Assessment
Habitat area	Area stable or increasing, subject to natural processes	There will be no land take within 30km of the SAC and therefore there is no potential for direct loss of habitat as a result of the proposed road. Potential for indirect impacts on the alluvial woodland in the form of alteration of the groundwater regime and water pollution during construction and operation were identified in the Screening assessment. These potential impacts have been fully assessed and where necessary, measures put in place to avoid them. The scientific assessments undertaken and measures that are in place to avoid any impacts are fully described in Sections 10.4.13.1, 10.5.4.1 & 10.5.4.4 of Appendix 4 & Appendix 5 to this NIS. A summary of the main pollution control measures is provided in Section 4.7. The proposed road project will in no way effect the area of alluvial woodland habitat within Lough Forbes SAC.
Habitat distribution	No decline	For the reasons stated above, there will be no decline in habitat distribution associated with the proposed road development
Woodland size	Area stable or increasing. Where topographically possible, "large" woods at least 25ha in size and "small" woods at least 3ha in size	For the reasons stated above, there will be no impact on woodland size
Woodland Structure: Cover and height	Diverse structure with a relatively closed canopy containing mature trees; sub canopy layer with semi mature trees and shrubs and well developed herb layer	For the reasons stated above, there will be no impact on woodland structure
Woodland Structure: community diversity and extent	Maintain diversity and extent of community types	

Attribute	Target	Assessment
Woodland Structure: natural regeneration	Seedlings, saplings and pole age-classes occur in adequate proportions to ensure survival of woodland canopy	
Hydrological regime: flooding depth/height of water table	Appropriate hydrological regime necessary for maintenance of alluvial vegetation	Detailed assessment of the potential for the proposed development to result in effects on the hydrological regime outside the footprint of the road was undertaken along the entire length of the proposed road development. Following on from these assessments, a range of design measures has been prescribed following industry best practice to minimise emissions to surface and ground water and to avoid any adverse effects on any downstream receptors and therefore on this habitat. These are described throughout Appendix 5 and summarized in Section 4.7 of this NIS.
Woodland Structure: dead wood	At least 30m^3/ha of fallen timber greater than 10cm diameter; 30 snags/ha (standing dead wood); both categories should include stems greater than 40cm diameter (greater than 20cm diameter in the case of alder)	For the reasons stated above, there will be no impact on woodland structure
Woodland Structure: veteran trees	No decline	
Vegetation structure: Indicators of local distinctiveness	No decline	For the reasons stated above, there will be no impact on vegetation structure
Vegetation composition: native tree cover	No decline. Native tree cover not less than 95%	For the reasons stated above, there will be no impact on vegetation structure
Vegetative composition: Typical species	A variety of typical native species present, depending on woodland type, including alder (*Alnus glutinosa*), willows (*Salix* spp) and, locally, oak (*Quercus robur*) and ash (*Fraxinus excelsior*)	For the reasons stated above, there will be no impact on vegetation composition
Vegetative Composition: negative indicator species	Negative indicator species, particularly non-native invasive species, absent or under control.	

No direct impacts on this habitat have been identified as the proposed road development is located entirely outside the European Site.

The pathways that would allow impacts on Alluvial Woodland during construction and operation of the proposed road development to occur were fully assessed and considered in the design of the proposed road development. Specific design measures were put in place following a scientific assessment of the potential effects of the proposed development. These detailed and site specific measures are fully described in Section 10.5 of Appendix 4 and also in Section 4.7 below. Measures to ensure that the proposed road development does not result in effects on ground and surface waters are described in the Construction Erosion and Sediment Control Plan (Appendix 5).

Post implementation of avoidance and control measures the residual impact on Alluvial Woodland would be imperceptible. The design of the proposed road development has been developed with an overall objective of minimising the impact on ecologically sensitive sites. Direct and indirect impacts on Alluvial woodland [91E0], within Lough Forbes Complex SAC, have been avoided through the design and associated control measures.

Natural eutrophic lakes with Magnopotamion or Hydrocharition – type vegetation [3150]

Information on this habitat was obtained from the NPWS (2013). The species account in that document (*The Status of EU Protected Habitats and Species in Ireland. Habitats* Assessments Volume 2. Version 1.1.) reads as follows:

> *Habitat 3150, Natural eutrophic lakes with Magnopotamion or Hydrocharition — type vegetation occurs in lowland, base-rich lakes in the midlands and north east of Ireland. Here it is characterised by high abundance and diversity of pondweeds (Potamogeton spp.), such as Potamogeton lucens, P. praelongus, P. perfoliatus, P. obtusifolius, P. berchtoldii and P. pectinatus. Other rooted, predominantly-submerged higher plants frequently co-occur, including, Myriophyllum spicatum, Hippuris vulgaris, Callitriche spp., Sagittaria sagittifolia and Ceratophyllum demersum, while free-floating species such Lemna trisulca are also common. The habitat is generally associated with large lakes, such as those of the Shannon system, and with small, but naturally productive lakes, such as those found in parts of the drumlin-belt of Cavan, Monaghan and Leitrim or the lowlands south east of the Burren. The name of this habitat ("eutrophic") has caused some confusion and discomfiture with freshwater ecologists specialising in water quality. Ireland does not have significant phosphorus-rich deposits; hence there are few, if any, lakes that can be characterised as naturally "eutrophic" in line with the standard OECD approach of using total phosphorus and chlorophyll a concentrations, and water transparency (OECD, 1982). It is possible that naturally eutrophic conditions do exist in some coastal freshwater lakes (these could perhaps be considered the 'freshwater extreme' of the coastal lagoon habitat); however such sites require further investigation. While further study of the habitat is required, it seems certain that the pondweed-rich variant found in Ireland requires mesotrophic waters, as defined by the OECD methods. 3150 lakes typically have well-developed reed swamp, fen and/or marsh communities around much of their shoreline. Wet woodland would have surrounded much of their shoreline in the past and has survived or re-colonised patches of many 3150 lake shores. Lakes with habitat 3150 are associated with catchments dominated by mineral soils and, hence, some of the most intensive agricultural lands in Ireland. Consequently, the habitat has been under significant pressure from eutrophication since the 1970s or before.*

The range and area of this habitat in Ireland has been assessed as Favourable as per NPWS (2013).

The structures and function and future prospects of the habitat are assessed as Inadequate (Qualifier: stable).

On the basis of the above, the overall assessment of conservation status Inadequate (Qualifier: stable). This apparent improvement since 2007 does not reflect a genuine change given that the status in 2007 was incorrectly assessed as Bad when in actual fact it should have been assessed as Inadequate.

The pressures and threats (National level) relating to this habitat, as identified in NPWS (2013), are listed below:

Pressures

- Diffuse pollution to surface waters due to agricultural and forestry activities (high importance)
- Pollution to surface waters by industrial plants (high importance)
- Other point source pollution to surface waters (medium importance)
- Diffuse pollution to surface waters due to household sewage and waste waters (medium importance)
- Diffuse pollution to surface waters due to other sources not listed (medium importance)
- Diffuse pollution to surface waters via storm overflows or urban run-off (low importance)
- Surface water abstractions for public water supply (low importance)
- Other major surface water abstractions (low importance)
- Surface water abstractions for agriculture (low importance)
- Mechanical removal of peat (low importance)
- Invasive non-native species (low importance)

Threats

- Diffuse pollution to surface waters due to agricultural and forestry activities (high importance)
- Pollution to surface waters by industrial plants (medium importance)
- Other point source pollution to surface waters (medium importance)
- Diffuse pollution to surface waters due to household sewage and waste waters (medium importance)
- Diffuse pollution to surface waters due to other sources not listed (medium importance)
- Diffuse pollution to surface waters via storm overflows or urban run-off (low importance)
- Surface water abstractions for public water supply (low importance)
- Other major surface water abstractions (low importance)
- Surface water abstractions for agriculture (low importance)
- Changes in abiotic conditions (low importance)
- Mechanical removal of peat (low importance)
- Invasive non-native species (low importance)

The targets and attributes for this habitat as per the specific conservation objectives for Lough Forbes Complex SAC have been reviewed and considered in relation to the current development and are described in Table 4.14 below.

Table 4.14 Targets and Attributes Associated with Site Specific Conservation Objectives for Natural Eutrophic Lakes with Magnopotamion or Hydrocharition – Type Vegetation [3150]

Attribute	Target	Assessment
Habitat area	Area stable or increasing, subject to natural processes	There will be no land take within 30km of the SAC and therefore there is no potential for direct loss of habitat as a result of the proposed road. Potential for indirect impacts on the eutrophic lake in the form of alteration of the ground or surface water regime or water pollution during construction and operation were identified in the Screening assessment. These potential impacts have been fully assessed and where necessary, measures put in place to avoid them. The scientific assessments undertaken and measures that are in place to avoid any impacts are fully described in Section 10.5 of Appendix 4 & in Appendix 5 to this NIS. A summary of the main pollution control measures is provided in Section 4.7. The proposed road project will in no way effect the area of natural eutrophic lake habitat within Lough Forbes SAC.
Habitat distribution	No decline, subject to natural processes	For the reasons described above, there will be no decline in habitat distribution associated with the proposed road development
Typical species	Typical species present, in good condition, and demonstrating typical abundances and distribution	For the reasons described above, there will be no effect on the typical species present within the habitat associated with the proposed road development
Vegetation composition: characteristic zonation	All characteristic zones should be present, correctly distributed and in good condition	For the reasons described above, there will be no impact on vegetation composition associated with the proposed road development
Vegetation distribution: maximum depth	Restore maximum depth of vegetation, subject to natural processes	For the reasons described above, there will be no impact on vegetation distribution associated with the proposed road development
Hydrological regime: water level fluctuations	Maintain appropriate natural hydrological regime necessary to support the habitat	Detailed assessment of the potential for the proposed development to result in effects on the hydrological regime outside the footprint of the road was undertaken along the entire length of the proposed road development. Following on from these assessments, a range of design measures has been prescribed following industry best practice to minimise emissions to surface and ground water and to avoid any adverse effects on any downstream ecological receptors and therefore on this habitat These are described in Section 10.4 of Appendix 4
Lake substratum quality	Maintain appropriate substratum type, extent and chemistry to support the vegetation	
Water quality: transparency	Maintain/restore appropriate Secchi transparency. There should be no decline in Secchi depth/transparency	

Attribute	Target	Assessment
Water quality: nutrients	Restore the concentration of nutrients in the water column to sufficiently low levels to support the habitat and its typical species	and in Appendix 5. They are also summarized in Section 4.7 of this NIS. There is no potential for the proposed road development to result in adverse effects on any of the lake substratum or water quality parameters.
Water quality: phytoplankton biomass	Maintain appropriate water quality to support the habitat, including good chlorophyll a status	
Water quality: phytoplankton composition	Maintain appropriate water quality to support the habitat, including good phytoplankton composition status	
Water quality: attached algal biomas	Maintain trace/ absent attached algal biomass (<5% cover) and good phytobenthos status	
Water quality: macrophyte status	Restore good macrophyte status	
Acidification status	Maintain appropriate water and sediment pH, alkalinity and cation concentrations to support the habitat, subject to natural processes	
Water colour	Restore appropriate water colour to support the habitat	
Dissolved organic carbon (DOC)	Maintain appropriate organic carbon levels to support the habitat.	
Turbidity	Maintain appropriate turbidity to support the habitat	
Fringing habitat: area	Maintain the area and condition of fringing habitats necessary to support the natural structure and functioning of the lake habitat	For the reasons listed above, there will be no impact on Fringing habitat area as a result of the proposed road

No direct impacts on this habitat have been identified as the proposed road development is located entirely outside the European Site.

Potential indirect impacts on the QI may arise in the form of emissions to surface and ground waters and potential hydrological changes resulting from road construction and operation. The assessment of the proposed road development identified potential pathways for impacts on this habitat in relation to the above listed *Medium importance* pressures and threats Diffuse and point source pollution to surface waters due to other sources not listed.

The pathways that would allow impacts on Natural Eutrophic Lakes during construction and operation of the proposed road development to occur were fully

assessed and considered in the design of the proposed road development. Specific design measures were put in place following a scientific assessment of the potential effects of the proposed development. These detailed and site specific measures are fully described in Section 10.5 of Appendix 4 and throughout Appendix 5. They are also summarised in Section 4.7 below. Measures to ensure that the proposed road development does not result in effects on ground and surface waters are described in the Construction Erosion and Sediment Control Plan (Appendix 5).

Post implementation of avoidance and pollution control measures the residual impact on Lough Forbes Complex SAC would be imperceptible. The design of the proposed road development has been developed with an overall objective of minimising the impact on ecologically sensitive sites. Direct and indirect impacts on Natural Eutrophic Lakes [3150], within Lough Forbes Complex SAC, have been avoided through the design and associated pollution control measures.

All aspects of the proposed road development which can, by themselves or in combination with other plans or projects, affect the site's conservation objectives have been identified in the light of the best scientific knowledge in the field. The implications for the European Site of the proposed road development, taking account of cumulative effects which result from the combination with other plans and projects, in view of the site's conservation objectives have been assessed.

In light of the Lough Forbes Complex SAC's conservation objectives, the proposed development will not adversely affect the integrity of the site concerned and no reasonable scientific doubt remains as to the absence of such effects.

4.5 Bellanagare Bog SPA (004105)

4.5.1 Identification of Pathways for Impacts

The potential pathways for the proposed road development to impact the Bellanagare Bog SPA have been identified and are described in Table 4.15 below. Potential impacts on the SCI may arise in the form of disturbance, loss of supporting habitat outside the European site and population fragmentation.

The generic conservation objective of this designated site is:

> *To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA*

The Specific Conservation Interest (SCI) of the SPA and the identified potential pathways for which significant effects as a result of the proposed road development exist are outlined in Table 4.15 below.

Table 4.15 Assessment of Pathways for Impact on the Individual SCI

SCI	Assessment of Pathway for Effects
Greenland White-fronted Goose (*Anser albifrons flavirostris*) [A395]	Potential impacts resulting from disturbance, loss of supporting habitat outside the European site, and potential population fragmentation. The potential for adverse effects on this species is considered further in this document.

Greenland White-fronted Goose (*Anser albifrons flavirostris*) [A395] (Wintering)

Wintering populations of this species are traditionally known to winter on peatland habitats, though now are more commonly recorded on wet grasslands and intensively managed agricultural fields where they feed on plant material including

roots, shoots, tubers and leaves. The species is listed on Annex I of the Birds Directive and is on the Birds of Conservation Concern in Ireland (BoCCI) Amber List as the majority of the winter population is located at less than 10 sites with the majority occurring at the Wexford Slobs. Bellanagare bog SPA is not one of these 10 overwintering sites.

Whilst no site specific Conservation Objectives are available for Bellanagare Bog SPA, targets and attributes for the conservation of this species are available in detailed Conservation Objectives Documents for other SPAs. In relation to the current assessment, attributes and related targets for this species were taken from Lough Swilly SPA (004075) and are listed in Table 4.16 below. These targets and attributes are representative of factors considered in the conservation of Greenland White-fronted Goose in other areas.

Table 4.16 Assessment of Attributes and Targets Associated with the Conservation of Greenland White-fronted Goose [A395]

Attribute	Target	Assessment
Population trend	Long term population trend stable or increasing	The ecological surveys associated with the proposed road development are included as Appendix 2. As part of these surveys, a habitat survey was undertaken and the route corridor was assessed for its suitability as habitat for wintering birds including Greenland Whitefronted Goose. In addition, three hour vantage point watches in the vicinity of the road and Bellanagare Bog SPA were undertaken twice per month throughout the winter of 2015/2016 The proposed road development is located approximately 500m away from this SPA at its closest point. It is buffered from the SPA by forestry plantations and the habitats within and adjacent to the proposed road development do not provide favourable highly managed and fertile wet grasslands that are likely to be utilised by the species. The road development is close to grade at this location and does not represent a barrier to commuting birds. No Greenland White Fronted Goose were recorded during any of the surveys undertaken and the comprehensive desk study that was undertaken revealed that the species is thought to have abandoned the SPA. Given the distance of the proposed road from the SPA, the presence of forestry between the proposed road and the SPA and the lack of suitable habitat for the species within the route corridor within the area and following scientific assessment, the following conclusions are made: • The proposed road development is unlikely to result in any effect on the long term population trend or numbers and distribution of birds on the site. • The proposed road will not prevent or discourage the species from returning to the SPA
Distribution	No significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	

The pathways that would allow impacts on Greenland White Fronted Goose during construction and operation of the proposed road development to occur were fully assessed and considered in the design of the proposed road development. Specific design measures were put in place following a scientific assessment of the potential effects of the proposed development. These detailed and site specific measures are fully described in Sections 7.3, 7.5 & 7.6 of Appendix 2 and also Section 4.7 below. Measures to ensure that the proposed road development does not result in effects on

ground and surface waters are described in the Construction Erosion and Sediment Control Plan (Appendix 5).

All aspects of the proposed road development which can, by themselves or in combination with other plans or projects, affect the site's conservation objectives have been identified in the light of the best scientific knowledge in the field (Appendix 2 of this document). The implications for the European Site of the proposed road development, taking account of cumulative effects which result from the combination with other plans and projects, in view of the site's conservation objectives have been assessed.

In light of the Bellanagare Bog SPA's conservation objectives, the proposed development will not adversely affect the integrity of the site concerned and no reasonable scientific doubt remains as to the absence of such effects.

These conclusions are made based on the following findings of the scientific assessment undertaken:

- The proposed road development is buffered from the SPA by a distance of 500m and existing conifer plantations.
- The route corridor in this area does not provide suitable intensive wet grassland habitat (supporting habitat) for the species and is highly unlikely to be utilised by the species as a foraging or roosting area outside the SPA.
- The road development is close to grade at this location and does not represent a barrier to commuting birds (fragmentation).

4.6 Lough Gara SPA (004048)

4.6.1 Identification of Pathways for Impacts

The screening assessment has identified potential pathways for the proposed road development to impact the Lough Gara SPA which is located approx. 2.4km to the north west. Potential impacts on the SCIs may arise in the form of deterioration of habitats as a result of water pollution, disturbance outside the European Site, loss of supporting habitat outside the European site and population fragmentation outside the European Site.

The generic conservation objective of this designated site is:

> *To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA*

Table 4.17 lists the SCIs of Lough Gara SPA and identifies the SCIs for which potential impact pathways for significant effects as a result of the proposed road development were identified in the Appropriate Assessment Screening Report.

Table 4.17 Assessment of Pathways for Impact on the Individual SCIs

SCI	Assessment of Pathway for Effects
Whooper Swan (*Cygnus cygnus*) [A038]	There is hydrological connectivity between the proposed road development and the SPA and the potential for hydrological change/pollution of the SPA must be considered on a precautionary basis. In addition, there is the potential for habitat loss, disturbance and fragmentation outside the SPA but potentially impacting on SCI populations associated with the SPA. The potential for adverse effects on SCI species is considered further in this document.
Greenland White-fronted Goose (*Anser albifrons flavirostris*) [A395]	

Whooper Swan (*Cygnus cygnus*) [A038] (Wintering)

This species breeds in Iceland and comes to Ireland during the winter. Whooper Swans feed mostly on lowland and open farmland around inland wetlands. The species is listed on Annex I of the Birds Directive and is on the Birds of Conservation Concern in Ireland (BoCCI) Amber-listed in Ireland due to Ireland hosting more than 20% of the wintering population (Colhoun & Cummins 2013).

Whilst no detailed Conservation Objectives are available for Lough Gara SPA, targets and attributes for the conservation of this species are available in detailed Conservation Objectives Documents for other SPAs. In relation to the current assessment, attributes and related targets for this species were taken from Lough Swilly SPA (004075) and are listed in Table 4.18 below. These targets and attributes are representative of factors considered in the conservation of Whooper Swan in other areas.

Table 4.18 Assessment of Attributes and Targets Associated with the Conservation of Whooper Swan [A038]

Attribute	Target	Assessment
Population trend	Long term population trend stable or increasing	The ecological surveys associated with the proposed road design are included in Sections 7.5 & 7.6 of Appendix 2. As part of these surveys, a habitat survey was undertaken and the route corridor was assessed for its suitability as habitat for wintering birds including Whooper Swan. During this survey, no intensively managed wet grasslands that would provide suitable habitat for the species were recorded within the core foraging range of less than 5km (as defined by Scottish Natural Heritage 2013) from the SPA were identified. It is considered unlikely that the proposed road will impact on the present or future use of the European Site by the SCI populations in respect of habitat loss, fragmentation or disturbance either outside or within the SPA. Potential for indirect impacts on the SPA in the form of alteration of the ground or surface water regime or water pollution during construction and operation were identified in the Screening assessment. These potential impacts have been fully assessed and where necessary, measures put in place to avoid them. The scientific assessments undertaken and measures that are in place to avoid any impacts are fully described in Sections 7.5 & 7.6 of Appendix 2, Sections 10.4.13.1 & 10.5.4.1 of Appendix 4 & Appendix 5 to this NIS. A summary of the main pollution control measures is provided in Section 4.7. In light of the above, there is no potential for the proposed development to result in adverse effects on Whooper Swan associated with Lough Gara SPA.
Distribution	No significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	

The pathways that would allow impacts on Whooper Swan during construction and operation of the proposed road development to occur were fully assessed and considered in the design of the proposed road development. Specific design measures were put in place following a scientific assessment of the potential effects of the proposed development. These detailed and site specific measures are fully described in Sections 7.5 & 7.6 of Appendix 2, Sections10.4.13.1 & 10.5.4.1 of Appendix 4 & Appendix 5. They are also summarised in Section 4.7 below. Measures to ensure that the proposed road development does not result in effects on ground and surface waters are described in the Construction Erosion and Sediment Control Plan (Appendix 5).

Greenland White-fronted Goose (*Anser albifrons flavirostris*) [A395] (Wintering)

Wintering populations of this species are traditionally known to winter on peatland habitats, though now are more commonly recorded on wet grasslands and intensively managed agricultural fields where they feed on plant material including roots, shoots, tubers and leaves. The species is listed on Annex I of the Birds Directive and is on the Birds of Conservation Concern in Ireland (BoCCI) Amber List as the majority of the winter population is located at less than 10 sites with the majority occurring at the Wexford Slobs. Lough Gara SPA is not one of these 10 overwintering sites.

Whilst no detailed Conservation Objectives are available for Lough Gara SPA, targets and attributes for the conservation of this species are available in detailed Conservation Objectives Documents for other SPAs. In relation to the current assessment, attributes and related targets for this species were taken from Lough Swilly SPA (004075) and are listed in Table 4.19 below. These targets and attributes are representative of factors considered in the conservation of Greenland White-fronted Goose in other areas.

Table 4.19 Assessment of Attributes and Targets Associated with the Conservation of Greenland White-fronted Goose [A395]

Attribute	Target	Assessment
Population trend	Long term population trend stable or increasing	The ecological surveys associated with the proposed road design are included in Sections 7.5 & 7.6 of Appendix 2. As part of these surveys, a habitat survey was undertaken and the route corridor was assessed for its suitability as habitat for wintering birds including Greenland White Fronted Goose. During this survey, no intensively managed wet grasslands or peatlands that would provide suitable habitat for the species was recorded within the core foraging range of 5 – 8km (as defined by Scottish Natural Heritage 2013) from the SPA were identified. It is considered unlikely that the proposed road will impact on the present or future use of the European Site by the SCI populations in respect of habitat loss, fragmentation or disturbance either outside or within the SPA. Potential for indirect impacts on the SPA in the form of alteration of the ground or surface water regime or water pollution during construction and operation were identified in the Screening assessment. These potential impacts have been fully assessed and where necessary, measures put in place to avoid them. The scientific assessments undertaken and measures that are in place to avoid any impacts are fully described in Appendices 4 & 5 to this NIS. A summary of the main pollution control measures is provided in Section 4.7. In light of the above, there is no potential for the proposed development to result in adverse effects on Greenland White Fronted Goose associated with Lough Gara SPA.
Distribution	No significant decrease in the numbers or range of areas used by waterbird species, other than that occurring from natural patterns of variation	

The pathways that would allow impacts on Greenland White Fronted Goose during construction and operation of the proposed road development to occur were fully assessed and considered in the design of the proposed road development. Specific design measures were put in place following a scientific assessment of the potential effects of the proposed development. These detailed and site specific measures are fully described in Sections 7.5 & 7.6 of Appendix 2, Sections 10.4.13.1 & 10.5.4.1 of

Appendix 4 & Appendix 5. They are also summarised in Section 4.7 below. Measures to ensure that the proposed road development does not result in effects on ground and surface waters are described in the Construction Erosion and Sediment Control Plan (Appendix 5).

All aspects of the proposed road development which can, by themselves or in combination with other plans or projects, affect the site's conservation objectives have been identified in the light of the best scientific knowledge in the field. The implications for the European Site of the proposed road development, taking account of cumulative effects which result from the combination with other plans and projects, in view of the site's conservation objectives have been assessed.

In light of the Lough Gara's conservation objectives, the proposed development will not adversely affect the integrity of the site concerned and no reasonable scientific doubt remains as to the absence of such effects.

4.7 Control Measures That Are in Place to Block Identified Pathways

The proposed road development has been constraint led from the initial phases of route selection. Throughout an iterative design process, potential impacts on European Sites have been identified and a suite of prescribed avoidance and protection measures has been incorporated into the project proposal to avoid any potential harmful or negative impacts associated with the proposed road.

The potential pathways for impacts on the various QI/SCI of the European Sites as identified in Sections 4.1 - 4.6 above are listed below and the measures employed in the proposed road development to prevent any such impacts are also discussed.

These measures are designed so that it is ensured that the proposed road development does not prevent or obstruct any of the QI/SCI from reaching favourable conservation status as per Article 1 of the EU Habitats Directive as defined below:

> *'conservation status of a species means the sum of the influences acting on the species concerned that may affect the long-term distribution and abundance of its populations within the territory referred to in Article 2;*
>
> *The conservation status will be taken as 'favourable' when*:
> *—population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and*
> *—the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and*
> *—there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis;*

Similarly, the best practice and design measures will ensure that the proposed road development does not prevent the QI/SCI of the European Sites from either achieving or maintaining Favourable Conservation Condition.

4.7.1 Potential for Direct Impacts on the European Sites

Avoidance by Design

The proposed road development avoids European designated sites and has been constraint led from the initial phases of route selection, throughout an iterative design process and into the final proposed road development. A series of workshops were held to identify inter-relationships and potential cumulative impacts between the

various members of the project team. The proposed road development has been designed to avoid any direct impacts on European sites that are designated for nature conservation. The proposed road development avoids all designated European sites and consequently there are no direct impacts.

Through careful planning and design, direct impacts on European sites and associated QIs/SCIs have been avoided at the route selection stage.

4.7.2 Potential for Indirect Impacts on the European Sites

Emissions to surface and groundwater and potential hydrological changes (such as; rainfall runoff diverted from existing overland flow paths, changes in low or peak flows within watercourses potentially altering discharge to larger waterbodies within the catchment, alterations to established stream and river hydrographs, diversion of waterbodies away from existing channel paths, groundwater lowering at cut sections affecting wetland areas and changes to groundwater recharge patterns due to interception disrupting lower groundwater levels in wetlands) were identified as potential indirect impacts on the Qualifying Interests/Special Conservation Interests of the following European sites.

- Annaghmore Lough (Roscommon) SAC (001626)
- Bellanagare Bog SAC (000592)
- Bellanagare Bog SPA (004105) (004105)
- Cloonshanville Bog SAC (000614)
- Lough Forbes Complex SAC (001818)
- Lough Gara SPA (004048)

General Control Measures

The proposed road has been developed having regard to all relevant TII guidelines, for the planning and construction of National Road Schemes, and National and European legislation. These guidelines for the construction of national roads include within the design for the general protection of the environment. The following is an overview of general design measures that will be employed throughout the entire length of the proposed road development to minimise and avoid negative impacts on the ecological receptors including European Sites.

- The land acquisition boundary associated with the proposed road will be fenced off at the outset of the construction phase of the project and will avoid the potential for un-necessary loss of habitat outside of the construction footprint.
- The Landscape Master Plan associated with the proposed road involves the planting of native hedgerow and woodland to replace the losses associated with the land take. The locations of the planting have been designed to minimise the impacts resulting from loss of such habitat throughout the proposed road development.
- The watercourse crossings have been designed to minimise the potential for both short and long term negative ecological impacts on all watercourses including drainage ditches. The design of the proposed road development minimises loss of habitat through appropriate design, ensures that the crossing points do not result in a barrier effect and that significant changes to the nature of the channel is avoided.
- A Construction Erosion & Sediment Control Plan (CESCP) has been prepared in respect of the construction phase of the project and is provided as Appendix 5 to this document. The potential for run off of pollutants during the

construction phase of the development will be fully managed with impacts on significant receptors avoided. The proposed road drainage has been designed to avoid the potential for ongoing pollution of the wider environment during the lifetime of the road.

Specific Pollution Control Measures

Watercourses

Specific control measures are in place to minimise adverse impacts on the watercourses that are located within and adjacent to the proposed road development. These watercourses, including the Carricknabraher, Owenaforeesha, Owenur, Strokestown and Scramoge Rivers provide surface water linkage to downstream European Sites as discussed above The control measures below are provided to ensure that the proposed road does not impact significantly on the water quality within any watercourse at, upstream or downstream of the crossing point It will also ensure that there is no adverse effect on the integrity of any European Site resulting from water pollution associated with the proposed road development.

All works in proximity to watercourses shall follow the specific protection and pollution control measures described in the Construction Erosion and Sediment Control Plan and the best practice guidance outlined in the following documents have been incorporated into the project design:

- NRA 'Guidelines for the crossing of Watercourses During Construction of National Road Schemes (2008);
- Shannon Regional Fisheries Board (SRFB) Protection and Conservation of Fisheries Habitat with Particular reference to Road Construction (2009);
- Inland Fisheries Ireland requirements publication" Guidelines on protection of fisheries during construction works in and adjacent to waters" (2016)

All instream works in watercourses identified as being of fisheries value shall be undertaken in accordance with the IFI Guidelines 2016 which state: "*To minimise adverse impacts on the fisheries resource works in rivers, streams, watercourses, lakes, reservoirs and ponds should normally (except in exceptional circumstances with the agreement of IFI) be carried out during the period July-September."*

The potential for run off of pollutants during the construction phase of the development will be fully managed with potential impacts on European Sites avoided. These measures are fully described the Construction Erosion and Sediment Control Plan that accompanies this NIS (Appendix 5).

The proposed road drainage has been designed in accordance with the relevant standards to avoid the potential for ongoing pollution of the wider environment, through discharge of un-treated surface water during the operation of the road. The main operational protection measures are provided in Section 9.5.3 of the EIAR and in Sections 10.5.3 & 10.5.4 of Appendix 4.

Pollution Prevention Measures

This proposed road development has the potential to cause pollution of the surrounding environment in the absence of design and control measures. Pollution could take a number of forms and occur during a number of the operations involved in the construction process and in operation. It is noted that the proposed road development will convey a significant amount of traffic diverted off the old N5 and, given the pollution prevention measures incorporated into the project design will result in a far greater level of ecological protection in relation to pollution from such

traffic. Listed below are the activities during which pollution may arise and the type of pollution that may occur along with prescribed control measures.

Earthworks

Construction of the proposed road development will involve excavation of soil. This creates the potential for sediment and/or nutrient run-off, especially if soil is stored in an un-vegetated state for a period of time. Suspended solids could potentially enter downstream natural habitats, via existing drainage features. It is considered unlikely that this would happen to a significant degree.

A Construction Erosion and Sediment Control Plan (Appendix 5) has been prepared for the development and the measures outlined in the document shall be strictly adhered to during the construction. The principle avoidance and control measures in relation to earthworks are outlined in Section 5 of the Erosion and Sediment Control Plan (Appendix 5).

Hydrocarbon Usage

The use of hydrocarbons during the construction process leads to the potential for pollution to enter the wider environment, including drainage ditches and watercourses. Leaks in poorly maintained plant and machinery could lead to hydrocarbon dispersal over works areas. Leaks in fuel storage tanks and spillages during refuelling operations could lead to larger releases of hydrocarbons into the environment.

The use of machinery carries the potential for accidental hydrocarbon contamination of works areas, by fuel spillages or oil leaks for example. The works will be carried out in accordance with the following measures to avoid such impacts:

- It is likely that all machinery will be refuelled from mobile tankers on the local / assess / haul / site roads. No refuelling is to take place within 50m of any watercourse.
- Mobile storage such as fuel bowsers will be bunded to 110% capacity to prevent spills. Tanks for bowsers and generators shall be double skinned.
- When not in use, all valves and fuel trigger guns from fuel storage containers will be locked.
- All plant refuelling will take place using mobile fuel bowsers. Only dedicated trained & competent personnel will carry out refuelling operations. Plant refuelling will take place as far as practicable from watercourses and not within 50m in any case. A spill kit and drip tray shall be on site at all times and available for all refuelling operations. Equipment shall not be left unattended during refuelling. All pipework from containers to pump nozzles will have anti siphon valves fitted.
- Strict procedures for plant inspection, maintenance and repairs shall be detailed in the contractor's method statements and machinery shall be checked for leaks before arrival on site.
- All site plant will be inspected at the beginning of each day prior to use. Defective plant shall not be used until the defect is satisfactorily fixed.
- All major repair and maintenance operations will take place off site.
- Care will be taken at all times to avoid contamination of the environment with contaminants other than hydrocarbons, such as uncured concrete or other chemicals.

Hydrological Change

Direct impacts on hydrologically sensitive habitats and species listed among the Qualifying Interests of the European Sites have been avoided. The potential exists for indirect impacts on the hydrology of the European sites and therefore indirect effects on their qualifying interests and Special Conservation Interests as described in the Sections above. Potential indirect impacts may result from a number of sources as described in Appendix 4, including:

- Road drainage outfalls, culverts, interceptor drains, diversions and truncations which would affect the wider water flow regime thus causing a change in the water balance of a downstream European Site.
- Interception of drainage paths by the permeable road formation resulting in diversion of waters and in a dewatering effects on adjacent wetlands areas which form part of or may be upstream of a European Site

The proposed development has been designed, such that the impacts on existing hydrological conditions will be ominimised as a result of the development. In this regard all existing watercourses and local drainage channels will be maintained to ensure increased drainage of adjacent lands does not occur. Where the road passes adjacent to wetland (peat) areas, longitudinal barriers will be incorporated within the road formation which will prevent the migration of water into road formations and thus prevent dewatering. Check dams will also be incorporated on toe drains to maintain wet conditions and limit dewatering effects on adjacent lands. The proposed mitigation measures (described in detail in Section 10.5.4.1 & 10.5.4.4 of Appendix 4) will ensure that the proposed development results in only localised changes in surface water flow. Each of the hydrologically sensitive European Designated Sites (SAC/SPA) listed above are located outside the area where localised effects will occur and therefore will not be affected. This is demonstrated in the detailed scientific assessment that is included as Appendix 4.

4.7.3 Specific Control Measures relating to the individual European Sites

Specific control measures are in place to ensure that the proposed road development does not result in adverse effects on the integrity of any European Site. Detailed scientific assessment of this potential was carried out during the design process. The results of these studies are presented in Appendices 2 & 4 of this NIS and synopsised below.

Annaghmore Lough (Roscommon) SAC (001626)

A potential hydrological pathway exists between the proposed development and Annaghmore Lough via Cregga Turlough. During flood conditions, Cregga Turlough overflows via a surface drain to Annaghmore Lough and therefore contamination of Cregga Turlough, which is adjacent to the proposed development, could cause downstream impacts at Annaghmore Lough in flood conditions.

No discharge of road pavement runoff waters to the Cregga Turlough will occur. This will avoid any potential pollution of the Turlough and its groundwater system and therefore protect Annaghmore Lough downstream. In the vicinity of Cregga Turlough, the road pavement waters will be collected in a sealed drainage system, passing through a treatment pond before being discharged to the Ovaun Stream. A detailed mitigation plan has been devised to avoid temporary pollution of Cregga Turlough during the construction phase and these measures are summarised in the CESCP given in detail in Section 7.3 of Appendix 5. These measures include the collection and treatment of all spoiled construction waters prior to discharge with a phased plan for advancing the deep rock cutting always providing a gradient for

outfall of the runoff waters. These measures will protect Annaghmore Lough downstream during the construction phase of the proposed development.

Bellanagare Bog SAC (000592) & Bellanagare Bog SPA (004105) (004105)

The proposed development passes through a section of cutover and degraded bog close to Frenchpark which passes within 200m of Bellanagare Bog SAC & SPA. At this location the road construction will require the excavation of unacceptable peat and alluvial material beneath the road alignment at up to 4m excavation depth which could give rise to drainage impacts on the adjacent cutover bog and on the raised bog habitat to the south (a portion of which forms part of the Bellanagare Bog SAC/SPA). Potential impacts would include the interception of drainage paths by the permeable road formation resulting in diversion of water with dewatering of adjacent soils/wetlands areas and an increase of drainage through the provision of toe and land drains. Water pollution impacts are considered unlikely as the European site is located upstream of the proposed road development. Best practice as described above and in Appendix 5 will be carried out as a matter of course.

In order to mitigate the impacts of the cutting through the peat material an impermeable longitudinal barrier will be provided running inside the road formation. This will impede water from being drained into the permeable road formation and draining the adjacent soils. All transverse flow paths/ditches will be maintained through culverting/piping and this will ensure the water balance of the wetland area is maintained. Similarly the use of shallow toe drains with check dams at the base of embankments will impede drainage of the area and maintain wet conditions. In addition, the measures outlined in the CSECP will ensure no adverse impacts on water quality occur during the construction phase of the proposed development.

Cloonshanville Bog SAC (000614)

Cloonshanville bog is located a significant distance from the proposed development (>1.5km) and there is therefore no potential for direct impacts associated with the proposed works such as dewatering or drainage. The European Site is located downstream of the Carricknabraher and Owennaforeesha Rivers, both of which are tributaries of the Breedoge River which passes along the eastern boundary of the SAC. The proposed development will discharge road drainage to both the Carricknabraher and Owennaforeesha Rivers and therefore impacts on water quality in these waterbodies could potentially impact on this SAC. A treatment pond is located upstream of each of the proposed outfalls to these rivers which will significantly minimise the potential for impacts on water quality prior to discharge. An assessment of the watercourses and their capacity to receive such discharge was carried out which indicated that there would not be a deterioration in the classification status of the receiving rivers. In addition pollution control facilities in the form a penstock will be included at each pond which can contain any spillages of contaminating substances should a spillage incident occur. The measures outlined in the CSECP will ensure no adverse impacts on water quality occur during the construction phase of the proposed development. There will therefore be no perceptible impact on Cloonshanville Bog SAC from a surface water perspective. All road drainage at this location will be collected and discharged to surface water bodies as described above with no groundwater discharges proposed. There will therefore be no perceptible changes in groundwater quality in the vicinity of Cloonshanville Bog SAC.

Lough Forbes Complex SAC (001818)

There will be no change in water quality at the Lough Forbes complex due to routine road drainage, particularly as any discharge will be subject to the measures

described in the preceding paragraph. Based on precautionary principle, this European Site has been considered to lie within the Zone of Impact of the proposed development in respect of a potential surface water spillage due to connectivity via the Scramoge River. The proposed developed is located c.10.5km west of the Lough Forbes Complex SAC at its closest point. In the event of a worst case scenario (i.e. in the event of a serious surface water contamination spillage) the proposed road development could have an impact as far downstream as this SAC site. A spillage risk assessment has identified this as a very low probability and the inclusion of penstocks in the attenuation pond design will reduce the potential impacts to imperceptible.

The measures outlined in the CSECP (Appendix 5) will ensure no adverse impacts on water quality occur during the construction phase of the proposed development.

Lough Gara SPA (004048)

Proposed road drainage outfalls discharge to an unnamed stream, the Carricknabraher River, the Owennaforeesha River and the Mantua Stream all of which join the Breedoge River before outfalling into Lough Gara SPA. Lough Gara SPA is located c.2.6km from the proposed development at its closest point, however most of the proposed outfalls are located much further upstream. Each of the road drainage outfalls includes attenuation pond treatment facilities as described in the preceding paragraphs and therefore there impacts onwater quality at Lough Gara from routine road drainage will be imperceptible. The main risk to Lough Gara would occur during in the event of a serious surface water contamination event. A spillage risk assessment has identified this as a very low probability and the inclusion of penstocks in the attenuation pond design will reduce the potential impacts to imperceptible.

The measures outlined in the CSECP will ensure no adverse impacts on water quality occur during the construction phase of the proposed development.

5. CUMULATIVE IMPACTS

5.1 Assessment of Cumulative Impacts

A search in relation to plans and projects that may have the potential to result in cumulative impacts on European sites was carried out. Data sources included the following:

- Roscommon County Council Website (Planning and Roads Sections)
- An Bord Pleanála Website (Planning Searches)
- Web search of Windfarm projects in Co. Roscommon
- Web Search for major infrastructure projects in Co. Roscommon
- Roscommon County Development Plan 2014 – 2020
- Coillte Roscommon Website

An overview of the search results is provided in Table 5.1. Where plans were considered, those objectives that related specifically to the protection of the environment and in particular, European Sites are listed. Other objectives of the plan that could potentially result in cumulative impacts were also considered but none were encouraging destruction, environmental or ecological damage and all would have to take cognisance of the objectives that positively promote protection of the environment. Therefore the presence of the plan results in the potential for a positive cumulative impact. A number of licensed waste facilities were also considered. It was noted that these waste licences were in place for the express purpose of environmental protection and regulation of potentially polluting activities. The proposed road development includes design features and mitigation measures that will prevent any adverse effects on European Sites on its own and therefore there is no potential for cumulative effects when considered in combination with any licensed waste facility. In addition to the plans and projects listed in Table 5.1 a number of small scale developments i.e. dwelling houses/extension were identified from the wider area surrounding the proposed road development.

Table 5.1 Other Plans and Projects

Plans and Projects	Key Policies/Issues/Objectives Directly Related To European Sites In The Zone of Impact	Potential Impact on European Sites
	Land Use and Spatial Plans	
Roscommon County Development Plan 2014-2020	**Policy for Designated Sites** **Policy 7.1** Protect proposed and designated Natural Heritage Areas, Special Protection Areas and Special Areas of Conservation. **Policy 7.2** Protect geological Natural Heritage Areas as they become proposed, designated and notified to Roscommon County Council during the lifetime of this plan. **Policy 7.3** Protect any additional areas that may be proposed or designated during the lifetime of the plan in accordance with Policy above **Policy 7. 4** Promote development in these areas, for recreational and educational purposes, where it would not conflict with the preservation and protection of these sites. **Policy 7.5** It is Council policy to implement the mitigation measures a s set out in Section 11.3 of the Environmental Report accompanying the Development Plan, which are envisaged to prevent, reduce and, as fully as possible, offset any significant adverse impacts on the environment of implementing the County Development Plan. These mitigation measures refer to biodiversity, human health, geology and soils, water quality, flooding, air, climatic factors, transport infrastructure, wastewater treatment, waste management, cultural assets and landscape as referred to in Table 48 of the Environmental report. **Objectives for Designated Sites** **Objective 7.1** Maintain or restore the favourable conservation condition of a designated or proposed designated site under the control of the Planning Authority. **Objective 7.2** Ensure Appropriate Assessment Screening, and, where required, Appropriate Assessment, is carried out for any plan or project which, individually, or in combination with other plans and projects is likely to have a significant direct or indirect impact on any Natura 2000 site or sites; in accordance with best practice guidance as issued by the National Parks & Wildlife Service of the Department of Arts, Heritage & the Gaeltacht and/or the Department of Environment, Community & Local Government. **Objectives for Nature Conservation** **Objective 7. 5** Protect and promote the conservation of biodiversity y outside of designated areas, while allowing for appropriate development, access and re creational activity. **Objective 7.6** Continue to carry out habitat mapping for the county to identify significant local habitats in the county. Mapping of habitats should prioritise: Habitats listed in Annex 2 of the EU Habitats Directive; Species listed in Annex 2 of the EU Habitats Directive; and Species listed in Annex 1 of the Birds Directive.	Potential Positive Impact

Plans and Projects	Key Policies/Issues/Objectives Directly Related To European Sites In The Zone of Impact	Potential Impact on European Sites
	Objective 7.6 Continue to carry out habitat mapping for the county to identify significant local habitats in the county. **Objective 7.7** Co - operate with statutory and other relevant agencies to identify, protect and conserve a representative sample of the county's wildlife habitats of local or regional importance, not otherwise protected by legislation. **Objective 7. 8** Identify, protect and conserve, in co - operation with the relevant statutory authorities and other groups, vulnerable, rare and threatened species or wild flora and fauna and their habitats. These include plant and animal species afforded protection under the Wildlife Acts and the EU Habitats & Birds Directives. **Objective 7.9** Retain where feasible and enhance important landscape features, such as lakes, rivers, wetlands, stonewalls, hedgerows etc, which form wildlife corridors and link habitats, where they provide, stepping stones necessary for wildlife to flourish. **Objective 7.10** Integrate biodiversity considerations into all Roscommon County Council activities **Objective 7.11** Ensure that the conservation and management of biodiversity is a key priority in water resource management. **Objective 7.12** Require that floodlighting proposals for historic structures are accompanied by a Bat Survey, carried out at the appropriate time of year by a suitably qualified person, so as to identify bat species present on the site and to specify pollution control measures required to ensure minimal disturbance to bats, if any, on the site. **Objective 7.13** Seek to minimize light intrusion by having regard to impacts of floodlighting and public lighting in public/open spaces in or close to designated areas. **Objective 7.14** Have regard to the recommendations of any national guidelines, which may come about during the lifetime of this plan, with respect to potential impacts on nature conservation, when considering development applications relating to activities; such as use of jet-ski's and power boats on sites of nature conservation importance. **Objective 7.15** Ensure that any development, which impacts on a townland boundary, roadside hedgerows or hedgerows which form links with other habitats and form wildlife corridors; should first seek to retain, translocate or replace with native species of local provenance, these hedges. The overall goal should be to have no net loss of the hedgerow resource. **Objective 7.16** The retention, re-location, or re-establishment of hedgerows in planning consents shall be an aim of the Planning Authority for those seeking Planning Permission where feasible. **Objective 7.17** Carry out a tree survey of the county to identify trees suitable for Tree Preservation Orders.	

Plans and Projects	Key Policies/Issues/Objectives Directly Related To European Sites In The Zone of Impact	Potential Impact on European Sites
	Objective 7. 18 Commit to using native species where ever possible in its landscaping work and on Roscommon County Council property **Objective 7.19** Assess applications for quarrying activity in proximity to eskers, having regard to the designated status of the esker and conserve them from inappropriate development. **Objective 7.20** Seek hydrological reports for significant developments within and close to peatlands so as to assess impacts on the integrity of peatland ecosystems. **Objective 7.21** Support projects which plan for future re - use of industrial cutaway bogs as sites for habitat creation, amenity use and economic use. **Objective 7.22** Seek hydrological reports for significant developments within and close to turloughs so as to assess impacts on the integrity of the turlough system and associated groundwater levels. **Objective 7.23** Support the work of the National Wetlands Wilderness Park committee. **Objective 7.24** Promote awareness and educational opportunities relating to wetlands in the county **Objective 7.25** Ensure that the County's wetlands are retained for their biodiversity and flood protection values. **Objective 7.26** Ensure that where flood alleviation works take place the natural heritage and landscape character of rivers, streams and watercourses are protected and enhanced to the greatest extent possible. **Objective 7.27** Encourage sensitive development, which does not lea d to a loss of, or cause damage to, the character, the principal components of, or the setting of parks, gardens and demesnes of special historic interest and which are protected. **Objective 7.28** In order to facilitate development, a condition of planning permission may include seed or cutting collection from rare plants surviving in a heritage garden or park, in order to facilitate survival of a rare species. **Objective 7.29** To co - operate with the Department of Arts, Heritage & the Gaeltacht and other interested groups to facilitate the protection, pro motion and enhancement of heritage gardens and parks in the county. **Objectives for Alien Invasive Species** **Objective 7.33** Support initiatives, which reduce the risk s of invasions, help control and manage new and established invasive species, monitor impacts, raise public awareness, improve legislation and address international obligations. **Objective 7.34** Implement conditions as appropriate, as part of a g rant of a planning permission or a waste permit, to prevent spread of invasive species.	

Plans and Projects	Key Policies/Issues/Objectives Directly Related To European Sites In The Zone of Impact	Potential Impact on European Sites
	Objective 7.35 Encourage the use of native species in amenity plan ting and stocking and related community actions to reduce the introduction and spread of non-native species. **Objective 7.36** Investigate the development of a local authority staff code of practice (COP) in relation to invasive species where resources permit.	
	Land Use and Spatial Plans	
Strokestown Local Area Plan 2010-2016	The local area plan was considers as part of the assessment. Policy numbers 77-93 and Objectives 77-89 relate to **Natural Heritage**. Objectives 90-92 relate to **Hedgerows**, Objectives 93-96 relate to **Trees and Woodland** and Objectives 97-99 relate to non-native **Alien species.**	Potential Positive Impact
	Conservation and Management Plans	
Shannon River Basin District Management Plan	The Shannon International RBD Management Plan sets out a number of objectives and measures for all water bodies in the western catchment. The following is applicable in relation to European Sites: **Core Objectives** • prevent deterioration; • restore good status; • reduce chemical pollution; • achieve water related protected areas objectives Chapter 5 of the Plan outlines the programme of measures for the RBD.	Potential Positive Impact
	Fisheries Plans	
Inland Fisheries Ireland (IFI) Corporate Plan 2011-2015	**Goals:** • To improve the protection and conservation of the resource. • To develop and improve wild fish populations. • To increase the number of anglers. • To generate a better return for Ireland from the resource	Potential Positive Impact
	Forestry Plans	
Coillte Mid West BAU 4 Strategic Plans 2016-2020	**Objectives** **1.** Adopt an organization wide system for managing environmental issues. The Director of Stewardship and Public Goods has responsibility for managing the implementation of this policy and our environmental management system (EMS).	Potential Positive Impact

Plans and Projects	Key Policies/Issues/Objectives Directly Related To European Sites In The Zone of Impact		Potential Impact on European Sites
	2. Manage our business in full compliance with all applicable laws, directives and regulations, as well as voluntary external accredited schemes to which we subscribe e.g. the Forest Stewardship Council 2 (FSC) and the Programme for the Endorsement of Forest Certification (PEFC). **3.** Prevent negative environmental impacts through a system of operational controls that include communication, written instructions and appropriate training **4.** Continually improving environmental performance by setting and reviewing objectives & targets related to significant environmental risks and putting into effect programmes to reduce those risks. **5.** Communicate, as appropriate, our Environmental Policy to Coillte staff and stakeholders, contractors and their employees and the communities within which we operate.		
	Waste Licensing & Permitting (Environmental Protection Agency)		
Active Waste Licence Details (Source www.epa.ie (17/07/2016)	**Reg No**.	W0059-03	No potential for significant cumulative impacts given that the activity is subject to a licence that requires compliance with conditions that are specifically designed to protect the environment
	Applicant Name:	Roscommon County Council	
	Facility Name:	Ballaghaderreen Landfill	
	Location of Facility:	Aghalustia Townland, Ballaghaderreen, Co. Roscommon,	
	Type of Facility:	Landfill	
	Main Class of Activity:	3.5	
	Other Classes of Activity (more)	3.1,3.4,3.13,	
	Application Date:	18/06/2009	
	Licence Status:	Licensed	
	Latest licence for this facility:	Reg No. W0059-03	
	Reg No.	W0073-01	
	Applicant Name:	Roscommon County Council	
	Facility Name:	Roscommon Landfill Facility	
	Location of Facility:	Killarney Townland, Roscommon, Roscommon.	
	Type of Facility:	Landfill	
	Main Class of Activity:	3.1	
	Other Classes of Activity (more)	3.4,3.6,3.7,3.11,3.12,3.13,4.2,4.3,4.4,4.13,	
	Application Date:	30/09/1998	
	Licence Status:	Licensed	
	Latest licence for this facility:	Reg No. W0073-01	

Plans and Projects	Key Policies/Issues/Objectives Directly Related To European Sites In The Zone of Impact		Potential Impact on European Sites
	Reg No.	W0163-01	
	Applicant Name:	Bruscar Bhearna Teoranta	
	Facility Name:	Bruscar Bhearna Teoranta (Ballaghaderreen)	
	Location of Facility:	Ballaghaderreen Industrial Estate, Ballaghaderreen, County Roscommon, Roscommon.	
	Type of Facility:	Waste Transfer Station	
	Main Class of Activity:	3.11	
	Other Classes of Activity (more)	3.12,3.13,4.2,4.3,4.4,4.11,4.13,	
	Application Date:	5/09/2001	
	Licence Status:	Licensed	
	Latest licence for this facility:	Reg No. W0163-01	
	Projects Identified within 10km of the Proposed Road Development		
Proposed Projects	The search identified three large-scale developments within 10km of the proposed route road development: • Slieve Bawn Wind Farm (Pl Ref: 10/507 Granted), 20 turbines, located 4km south of the proposed road development • Runnaboll Wind Turbine (Pl Ref: 13/36 Granted) single turbine; located 7km north of the proposed road development.		No potential for significant cumulative impacts, given that the proposed road development will not result in any perceptible effects on any European Site and cannot contribute to any cumulative effect when considered in combination with these permitted projects

Plans and Projects	Key Policies/Issues/Objectives Directly Related To European Sites In The Zone of Impact	Potential Impact on European Sites
Completed projects	The search identified a number of completed developments within 10km of the proposed route alignment: • N5 Ballaghaderreen Bypass Road Project, this scheme comprised 13.6km of standard single carriageway and provided a bypass to the north of Ballaghaderreen town. The project included realignment/bridging of local roads and a major grade separated junction between the N5 and R293 to provide access to the town. An Bord Pleanála approved the scheme in 2008. Works commenced on November 2, 2012, and the road opened on September 2, 2014. • N5 Scramoge to Cloonmore Road Project. This scheme comprised an 8.3km stretch of standard single carriageway between Strokestown and Longford and opened in May 2004. • N5 Longford Bypass, which involved construction of 2.6km of single carriageway and 6 structures. The project was completed in August 2012.	No potential for significant cumulative impacts, given the design measures that are in place on each of these projects (along with those proposed for this road development) to avoid impacts on European Sites. These include standard measures to avoid impacts on downstream watercourses, which are the identified pathway for effects on European Sites

5.2 Conclusion of Cumulative Impact Assessment

It is considered that the scale of the works and the implementation of effective environmental control measures will avoid all impacts on European sites And there is no potential.

6. CONCLUDING STATEMENT

6.1 Characteristics of the Sites and Development

Description of Project

The proposed road development is described in greater detail in Section Two of this report and synopsised below. The Proposed road development is approx. 33.4km long. It commences at the tie-in with the recently completed N5 Ballaghaderreen Bypass and rejoins the existing N5 at Scramoge to the east of Strokestown.

Is the project directly connected with or necessary to the management of the site?

The project is not directly connected with or necessary to the management of any European Site.

Are there any other projects or plans that together with the project being assessed could affect the site?

A search in relation to plans and projects that may have the potential to result in cumulative impacts on European sites was carried out and is presented in Section 5 of this Natura Impact Statement The proposed N5 road development will have no significant individual or cumulative impacts on any European site in any regard.

6.2 Assessment of Significance of Effects

Describe how the project is likely to affect the Natura 2000 sites

The project as planned will not adversely affect the integrity of any European site. During this assessment, a number of pathways for potential impacts on the Qualifying Interests and Special Conservation Interests of European sites with connectivity were identified. This report has provided an assessment of all potential pathways for direct impacts or indirect impacts on European Sites. Any identified potential sources of effect were removed or the pathways for impact robustly blocked to avoid the potential for any significant impacts via any of the pathways identified.

Explain why these effects are not considered significant

- There will be no negative direct impacts or reduction in Annex I habitat area within any European Site.
- There will be no reduction in key habitats supporting populations of Annex I bird species and no reduction in the populations of any Annex I species.
- There will be no reduction in key habitats supporting populations of Annex II species and no reduction in the populations of any Annex II species.
- Any potential pathways for impact have been blocked through good design, best practice and a thorough investigation of the suitability of the lands for development of this type.
- The works themselves will involve little disturbance or disruption to the ecological processes in the area during either construction or operation.

6.3 Data Collected to Carry Out Assessment

In preparation of the report, the following sources were used to gather information:

- Review of NPWS Site Synopses, Conservation Objectives for the European Sites

- Review of 2013 and 2007 EU Habitats Directive (Article 17) Reports.
- Review of online web-mappers: National Parks and Wildlife Service (NPWS), Teagasc, EPA, Water Framework Directive (WFD), Geological Survey of Ireland (GSI), Inland Fisheries Ireland (IFI) & Irish Wetland Bird Survey I-WeBS.
- Review of specially requested records from the NPWS Rare and Protected Species Database for the hectads which overlap with the proposed road development.
- Review of Bird Atlases: (Sharrock, 1976; Lack, 1986; Gibbons et al., 1993; Balmer et al., 2013).
- Review of Birds of Conservation Concern (BoCCI) in Ireland 2014-2019 (Colhoun & Cummins, 2013)
- Review of the Bat Conservation Ireland (BCI) Private Database
- Inland Fisheries Ireland (IFI) Reports
- Review of OS maps and aerial photographs of the site of the proposed road development.
- Review of relevant databases including National Biodiversity Ireland Database and available literature of previous surveys conducted in the area.
- Review of other plans and projects within the area.
- Detailed ecological and hydrological/hydrogeological surveys including general habitat surveys and specialist surveys for protected habitats, flora and fauna (See Appendices 2 & 4 for full details)

6.4 Integrity of the European Sites

As per the EC, *Article 6(3) and (4) Guidance Document*, the meaning of integrity is defined as follows;

> *'The integrity of a 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' (MN2000, paragraph 4.6(3))'.*

Based on the objective information gathered and the predictions made about the changes that are likely to result from the construction and operation stages of the project, the Integrity of Site Checklist, as per Box 10 of the EC *Article 6(3) and (4) Guidance Document*, has been completed for each of the screened-in European sites.

In light of the conclusions of the Appropriate Assessment Screening Report (Section 3.3 above), this Natura Impact Statement has considered the potential impact of the proposed road development on the following European Sites:

- Annaghmore Lough (Roscommon) SAC (001626)
- Bellanagare Bog SAC (000592)
- Bellanagare Bog SPA (004105)
- Cloonshanville Bog SAC (000614)
- Lough Forbes Complex SAC (001818)
- Lough Gara SPA (004048) (004048)

6.4.1 Integrity of Annaghmore Lough (Roscommon) SAC (001626)

Based on the objective information gathered and the predictions made about the changes that are likely to result from the construction and operation stages of the project, the integrity of site checklist, as per Box 10 of EC,2001, is completed, assessing potential adverse impacts and control measures incorporated into the project design, in Table 6.1 below.

Table 6.1 Integrity of Site Checklist and Assessment of Control Measures for Annaghmore Lough (Roscommon) SAC

Does the project have the potential to:	Potential Adverse Effects and Control Measure Assessment	Residual Impact Yes or No
Conservation Objectives		
Cause delays in progress towards achieving the conservation objectives of the site?	Annex I Habitats: There will be no loss and/or disturbance to habitats therefore the proposed development will not cause delays in achieving the conservation objectives of the site. Annex II Species: The potential for loss and/or disturbance of key species will be avoided. The development will not cause delays in achieving the conservation objectives of the site. Best practice incorporated into the project design and required control measures are outlined in Section 4.7of this NIS and in the Construction Erosion and Sediment Control Plan (Appendix 5).	No
Interrupt progress towards achieving the conservation objectives of the site?	Annex I Habitats: The potential for loss and/or disturbance to habitats will be avoided and will not cause delays in achieving the conservation objectives of the site. Annex II Species: The potential for loss and/or disturbance of key species will be avoided and will not cause delays in achieving the conservation objectives of the site. Best practice incorporated into the project design and required control measures are outlined in Section 4.7 and in the Construction Erosion and Sediment Control Plan (Appendix 5).	No
Disrupt those factors that help to maintain the favourable conditions of the site?	Potential impacts affecting groundwater and surface water quality (a key indicator of conservation value) within the localised area of the proposed development will be avoided through implementation of control and protection measures. Best practice incorporated into the project design and required control measures are outlined in Section 4.7 and in the Construction Erosion and Sediment Control Plan (Appendix 5). The risk of introduction and/or dispersion of non-native invasive species will be avoided by following the guidelines provided in the NRA 2010 guidelines. An Invasive species Management Plan will be prepared in relation to the treatment of the identified stand of Knotweed in the townland of Vesnoy. Prior to any works being carried out, a pre-construction Invasive species survey will be undertaken to ensure that additional Invasives have not been introduced to areas within or close to the road footprint.	No

Does the project have the potential to:	Potential Adverse Effects and Control Measure Assessment	Residual Impact Yes or No
Interfere with the balance, distribution and density of key species that are the indicators of the favourable condition of the site?	Potential indirect uncontrolled impacts on the supporting habitat of the QI may arise in the form of emissions to surface and ground waters and potential hydrological changes resulting from road construction and operation. Best practice incorporated into the project design and required control measures are outlined in Section 4.7 and in the Construction Erosion and Sediment Control Plan (Appendix 5).	No
Other Indicators		
Cause changes to the vital defining aspects (e.g. nutrient balance) that determine how the site functions as a habitat or ecosystem?	Potential indirect uncontrolled impacts may occur through pollution of ground water and surface water during the construction and operational phases. However these potential impacts can be effectively controlled and avoided.	No
Change the dynamics of the relationships (between, for example, soil and water or plants and animals) that define the structure and/or function of the site?	Potential indirect uncontrolled impacts may occur through pollution of ground water and surface watercourses during the construction phase. This could impact on protected habitats and species downstream of the proposed development. However these potential impacts can be effectively controlled and avoided. Best practice incorporated into the project design and required control measures are outlined in Section 4.7 and in the Construction Erosion and Sediment Control Plan (Appendix 5).	No
Interfere with predicted or expected natural changes to the site (such as water dynamics or chemical composition)?	Potential indirect uncontrolled impacts may occur through pollution of ground water and surface watercourses during the construction phase. This could impact on protected habitats and species downstream of the proposed development. However these potential impacts can be effectively controlled and avoided. Best practice incorporated into the project design and required control measures are outlined in Section 4.7 and in the Construction Erosion and Sediment Control Plan (Appendix 5).	No
Reduce the area of key habitats?	The proposed road development is located 0.9km from the SAC. There will be no direct impact on key habitats within the SAC. Potential indirect uncontrolled impacts may occur through pollution of ground water and surface watercourses during the construction and operational phase. This could impact on protected habitats and species downstream of the proposed development. However these potential impacts can be effectively controlled and avoided. Best practice incorporated into the project design and required control measures are outlined in Section 4.7 and in the Construction Erosion and Sediment Control Plan (Appendix 5).	No

Does the project have the potential to:	Potential Adverse Effects and Control Measure Assessment	Residual Impact Yes or No
Reduce the population of key species?	There will be no direct impacts on populations of key species. Potential indirect uncontrolled impacts may occur through pollution of ground water and surface watercourses during the construction and operational phase. This could impact on protected habitats and species downstream of the proposed development. However these potential impacts can be effectively controlled and avoided. Best practice incorporated into the project design and required control measures are outlined in Section 4.7 and in the Construction Erosion and Sediment Control Plan (Appendix 5).	No
Change the balance between key species?	Potential indirect uncontrolled impacts may occur through pollution of ground water and surface watercourses during the construction and operational phase. This could impact on protected habitats and species downstream of the proposed development. However these potential impacts can be effectively controlled and avoided. Best practice incorporated into the project design and required control measures are outlined in Section 4.7 and in the Construction Erosion and Sediment Control Plan (Appendix 5).	No
Reduce diversity of the site?	Potential indirect uncontrolled impacts may occur through pollution of ground water and surface watercourses during the construction and operational phase. This could impact on protected habitats and species downstream of the proposed development. However these potential impacts can be effectively controlled and avoided. Best practice incorporated into the project design and required control measures are outlined in Section 4.7 and in the Construction Erosion and Sediment Control Plan (Appendix 5).	No
Result in disturbance that could affect population size or density or the balance between key species?	There is no potential for disturbance related impacts given the nature of the QIs and the distance from the SAC (i.e. 0.9km).	No
Result in fragmentation?	The proposed road development is located 0.9km from the SAC. There is no potential for habitat or species fragmentation.	No
Result in loss or reduction of key features (e.g. tree cover, tidal exposure, annual flooding, etc.)?	No Key features will be lost as a result of construction or operation of the proposed development.	No

Having regard to the above, the proposed road development, individually or in combination with other plans and projects, in light of best scientific knowledge in the field, will not, in view of the sites' conservation objectives, adversely affect the integrity of any Annaghmore Lough SAC, and no reasonable scientific doubt remains as to the absence of such effects.

6.4.2 Integrity of Bellanagare Bog SAC (000592)

Based on the objective information gathered and the predictions made about the changes that are likely to result from the construction and operation stages of the project, the integrity of site checklist, as per Box 10 of EC, 2001, is completed, assessing potential adverse impacts and control measures incorporated into the project design, in Table 6.2 below.

Table 6.2 Integrity of Site Checklist and Control Measure Assessment for Bellanagare Bog SAC

Does the project have the potential to:	Potential Adverse Effects and Control Measure Assessment	Residual Impact Yes or No
Conservation Objectives		
Cause delays in progress towards achieving the conservation objectives of the site?	Annex I Habitats: There will be no loss and/or disturbance to habitats therefore the proposed development will not cause delays in achieving the conservation objectives of the site. Annex II Species: No QI species for this site. Best practice incorporated into the project design and required control measures are outlined in Section 4.7 and in the Construction Erosion and Sediment Control Plan (Appendix 5).	No
Interrupt progress towards achieving the conservation objectives of the site?	Annex I Habitats: The potential for loss and/or disturbance to habitats will be avoided and will not cause delays in achieving the conservation objectives of the site. Annex II Species: No QI species for this site. Best practice incorporated into the project design and required control measures are outlined in Section 4.7 and in the Construction Erosion and Sediment Control Plan (Appendix 5).	No
Disrupt those factors that help to maintain the favourable conditions of the site?	Potential impacts affecting peatland hydrology (a key indicator of conservation value) within the localised area of the proposed development will be avoided. Best practice incorporated into the project design and required control measures are outlined in Section 4.7 and in the Construction Erosion and Sediment Control Plan (Appendix 5). The risk of introduction and/or dispersion of non-native invasive species will be avoided by following the guidelines provided in the NRA 2010 guidelines. An Invasive species Management Plan will be prepared in relation to the treatment of the identified stand of Knotweed in the townland of Vesnoy. Prior to any works being carried out, a pre-construction Invasive species survey will be undertaken to ensure that additional Invasive have not been introduced to areas within or close to the road footprint.	No
Interfere with the balance, distribution and density of key species that are the indicators of the favourable condition of the site?	Annex II Species: No QI species for this site.	No

Does the project have the potential to:	Potential Adverse Effects and Control Measure Assessment	Residual Impact Yes or No
Other Indicators		
Cause changes to the vital defining aspects (e.g. nutrient balance) that determine how the site functions as a habitat or ecosystem?	Potential impacts affecting peatland hydrology (a key indicator of conservation value) within the localised area of the proposed development will be avoided through implementation of control and protection measures. The risk of introduction and/or dispersion of non-native invasive species will be avoided by following the guidelines provided in the NRA 2010 guidelines. Best practice incorporated into the project design and required control measures are outlined in Section 4.7 and in the Construction Erosion and Sediment Control Plan (Appendix 5).	No
Change the dynamics of the relationships (between, for example, soil and water or plants and animals) that define the structure and/or function of the site?	Potential impacts affecting peatland hydrology (a key indicator of conservation value) within the localised area of the proposed development will be avoided through implementation of control and protection measures. The risk of introduction and/or dispersion of non-native invasive species will be avoided by following the guidelines provided in the NRA 2010 guidelines. Best practice incorporated into the project design and required control measures are outlined in Section 4.7 and in the Construction Erosion and Sediment Control Plan (Appendix 5).	No
Interfere with predicted or expected natural changes to the site (such as water dynamics or chemical composition)?	Potential impacts affecting peatland hydrology (a key indicator of conservation value) within the localised area of the proposed development will be avoided through implementation of control and protection measures. The risk of introduction and/or dispersion of non-native invasive species will be avoided by following the guidelines provided in the NRA 2010 guidelines. Best practice incorporated into the project design and required control measures are outlined in Section 4.7 and in the Construction Erosion and Sediment Control Plan (Appendix 5).	No
Reduce the area of key habitats?	The proposed road development is located 0.2km from the SAC. There will be no direct impact on key habitats within the SAC. Potential impacts affecting peatland hydrology (a key indicator of conservation value) within the localised area of the proposed development will be avoided through implementation of control and protection measures. Best practice incorporated into the project design and required control measures are outlined in Section 4.7 and in the Construction Erosion and Sediment Control Plan (Appendix 5).	No
Reduce the population of key species?	The will be no reduction in key floral species associated with the peatland habitats. Best practice incorporated into the project design and required control measures are outlined in Section 4.7 and in the Construction Erosion and Sediment Control Plan (Appendix 5).	No

Does the project have the potential to:	Potential Adverse Effects and Control Measure Assessment	Residual Impact Yes or No
Change the balance between key species?	The will be no change in balance between key floral species associated with the peatland habitats. Best practice incorporated into the project design and required control measures are outlined in Section 4.7 and in the Construction Erosion and Sediment Control Plan (Appendix 5).	No
Reduce diversity of the site?	Three will be ne reduction in diversity of the site. Best practice incorporated into the project design and required control measures are outlined in Section 4.7 and in the Construction Erosion and Sediment Control Plan (Appendix 5).	No
Result in disturbance that could affect population size or density or the balance between key species?	There is no potential for disturbance related impacts given the nature of the QIs and the distance from the SAC (i.e. 0.2km).	No
Result in fragmentation?	The proposed road development is located 0.2km from the SAC. There is no potential for habitat or species fragmentation.	No
Result in loss or reduction of key features (e.g. tree cover, tidal exposure, annual flooding, etc.)?	No Key features will be lost as a result of construction or operation of the proposed development.	No

Having regard to the above, the proposed road development, individually or in combination with other plans and projects, in light of best scientific knowledge in the field, will not, in view of the sites' conservation objectives, adversely affect the integrity of any Bellanagare Bog SAC, and no reasonable scientific doubt remains as to the absence of such effects.

6.4.3 Integrity of Cloonshanville Bog SAC (000614)

Based on the objective information gathered and the predictions made about the changes that are likely to result from the construction and operation stages of the project, the integrity of site checklist, as per Box 10 of EC, 2001, is completed, assessing potential adverse impacts and control measures incorporated into the project design, in Table 6.3 below.

Table 6.3 Integrity of Site Checklist and Assessment for Cloonshanville Bog SAC

Does the project have the potential to:	Potential Adverse Effects and Control Measure Assessment	Residual Impact Yes or No
Conservation Objectives		
Cause delays in progress towards achieving the conservation objectives of the site?	Annex I Habitats: There will be no loss and/or disturbance to habitats therefore the proposed development will not cause delays in achieving the conservation objectives of the site. Annex II Species: No QI species for this site. Best practice incorporated into the project design and required control measures are outlined in Section 4.7 and in the Construction Erosion and Sediment Control Plan (Appendix 5).	No
Interrupt progress towards achieving the conservation objectives of the site?	Annex I Habitats: The potential for loss and/or disturbance to habitats will be avoided and will not cause delays in achieving the conservation objectives of the site. Annex II Species: No QI species for this site. Best practice incorporated into the project design and required control measures are outlined in Section 4.7 and in the Construction Erosion and Sediment Control Plan (Appendix 5).	No
Disrupt those factors that help to maintain the favourable conditions of the site?	Potential impacts affecting peatland hydrology (a key indicator of conservation value) within the localised area of the proposed development will be avoided. Best practice incorporated into the project design and required control measures are outlined in Section 4.7 and in the Construction Erosion and Sediment Control Plan (Appendix 5). The risk of introduction and/or dispersion of non-native invasive species will be avoided by following the guidelines provided in the NRA 2010 guidelines. An Invasive species Management Plan will be prepared in relation to the treatment of the identified stand of Knotweed in the townland of Vesnoy. Prior to any works being carried out, a pre-construction Invasive species survey will be undertaken to ensure that additional Invasive have not been introduced to areas within or close to the road footprint.	No
Interfere with the balance, distribution and density of key species that are the indicators of the favourable condition of the site?	Annex II Species: No QI species for this site.	No

Does the project have the potential to:	Potential Adverse Effects and Control Measure Assessment	Residual Impact Yes or No
Other Indicators		
Cause changes to the vital defining aspects (e.g. nutrient balance) that determine how the site functions as a habitat or ecosystem?	Potential impacts affecting peatland hydrology (a key indicator of conservation value) within the localised area of the proposed development will be avoided through implementation of control and protection measures. The risk of introduction and/or dispersion of non-native invasive species will be avoided by following the guidelines provided in the NRA 2010 guidelines. Best practice incorporated into the project design and required control measures are outlined in Section 4.7 and in the Construction Erosion and Sediment Control Plan (Appendix 5).	No
Change the dynamics of the relationships (between, for example, soil and water or plants and animals) that define the structure and/or function of the site?	Potential impacts affecting peatland hydrology (a key indicator of conservation value) within the localised area of the proposed development will be avoided through implementation of control and protection measures. The risk of introduction and/or dispersion of non-native invasive species will be avoided by following the guidelines provided in the NRA 2010 guidelines. Best practice incorporated into the project design and required control measures are outlined in Section 4.7 and in the Construction Erosion and Sediment Control Plan (Appendix 5).	No
Interfere with predicted or expected natural changes to the site (such as water dynamics or chemical composition)?	Potential impacts affecting peatland hydrology (a key indicator of conservation value) within the localised area of the proposed development will be avoided through implementation of control and protection measures. The risk of introduction and/or dispersion of non-native invasive species will be avoided by following the guidelines provided in the NRA 2010 guidelines. Best practice incorporated into the project design and required control measures are outlined in Section 4.7 and in the Construction Erosion and Sediment Control Plan (Appendix 5).	No
Reduce the area of key habitats?	The proposed road development is located 1.7km from the SAC. There will be no direct impact on key habitats within the SAC. Potential impacts affecting peatland hydrology (a key indicator of conservation value) within the localised area of the proposed development will be avoided through implementation of control and protection measures. Best practice incorporated into the project design and required control measures are outlined in Section 4.7 and in the Construction Erosion and Sediment Control Plan (Appendix 5).	No
Reduce the population of key species?	The will be no reduction in key floral species associated with the peatland habitats. Best practice incorporated into the project design and required control measures are outlined in Section 4.7 and in the Construction Erosion and Sediment Control Plan (Appendix 5).	No

Does the project have the potential to:	Potential Adverse Effects and Control Measure Assessment	Residual Impact Yes or No
Change the balance between key species?	The will be no change in balance between key floral species associated with the peatland habitats. Best practice incorporated into the project design and required control measures are outlined in Section 4.7 and in the Construction Erosion and Sediment Control Plan (Appendix 5).	No
Reduce diversity of the site?	There will be no reduction in diversity of the site. Best practice incorporated into the project design and required control measures are outlined in Section 4.7 and in the Construction Erosion and Sediment Control Plan (Appendix 5).	No
Result in disturbance that could affect population size or density or the balance between key species?	There is no potential for disturbance related impacts given the nature of the QIs and the distance from the SAC (i.e. 1.7km).	No
Result in fragmentation?	The proposed road development is located 1.7km from the SAC. There is no potential for habitat or species fragmentation.	No
Result in loss or reduction of key features (e.g. tree cover, tidal exposure, annual flooding, etc.)?	No Key features will be lost as a result of construction or operation of the proposed development.	No

Having regard to the above, the proposed road development, individually or in combination with other plans and projects, in light of best scientific knowledge in the field, will not, in view of the sites' conservation objectives, adversely affect the integrity of any Cloonshanville Bog SAC, and no reasonable scientific doubt remains as to the absence of such effects.

6.4.4 Integrity of Lough Forbes Complex SAC (001818)

Based on the objective information gathered and the predictions made about the changes that are likely to result from the construction and operation stages of the project, the integrity of site checklist, as per Box 10 of EC, 2001, is completed, assessing potential adverse impacts and control measures incorporated into the project design, in Table 6.4 below.

Table 6.4 Integrity of Site Checklist and Assessment for Lough Forbes SAC

Does the project have the potential to:	Potential Adverse Effects and Control Measure Assessment	Residual Impact Yes or No
Conservation Objectives		
Cause delays in progress towards achieving the conservation objectives of the site?	Annex I Habitats: There will be no loss and/or disturbance to habitats therefore the proposed development will not cause delays in achieving the conservation objectives of the site. Annex II Species: No QI species for this site. Best practice incorporated into the project design and required pollution control measures are outlined in Section 4.7 and in the Construction Erosion and Sediment Control Plan (Appendix 5).	No
Interrupt progress towards achieving the conservation objectives of the site?	Annex I Habitats: The potential for loss and/or disturbance to habitats will be avoided and will not cause delays in achieving the conservation objectives of the site. Annex II Species: No QI species for this site. Best practice incorporated into the project design and required pollution control measures are outlined in Section 4.7 and in the Construction Erosion and Sediment Control Plan (Appendix 5).	No
Disrupt those factors that help to maintain the favourable conditions of the site?	Potential impacts affecting surface water quality and hydrology (key indicators of conservation value) within the localised area of the proposed development will be avoided. Best practice incorporated into the project design and required control measures are outlined in Section 4.7 and in the Construction Erosion and Sediment Control Plan (Appendix 5). The risk of introduction and/or dispersion of non-native invasive species will be avoided by following the guidelines provided in the NRA 2010 guidelines. An Invasive species Management Plan will be prepared in relation to the treatment of the identified stand of Knotweed in the townland of Vesnoy. Prior to any works being carried out, a pre-construction Invasive species survey will be undertaken to ensure that additional Invasive have not been introduced to areas within or close to the road footprint.	No
Interfere with the balance, distribution and density of key species that are the indicators of the favourable condition of the site?	Annex II Species: No QI species for this site.	No

Does the project have the potential to:	Potential Adverse Effects and Control Measure Assessment	Residual Impact Yes or No
Other Indicators		
Cause changes to the vital defining aspects (e.g. nutrient balance) that determine how the site functions as a habitat or ecosystem?	Potential impacts affecting surface water quality and hydrology key indicators of conservation value) within the localised area of the proposed development will be avoided. The risk of introduction and/or dispersion of non-native invasive species will be avoided by following the guidelines provided in the NRA 2010 guidelines. Best practice incorporated into the project design and required pollution control measures are outlined in Section 4.7 and in the Construction Erosion and Sediment Control Plan (Appendix 5).	No
Change the dynamics of the relationships (between, for example, soil and water or plants and animals) that define the structure and/or function of the site?	Potential impacts affecting surface water quality and hydrology (key indicators of conservation value) within the localised area of the proposed development will be avoided through implementation of control and protection measures. The risk of introduction and/or dispersion of non-native invasive species will be avoided by following the guidelines provided in the NRA 2010 guidelines. Best practice incorporated into the project design and required control measures are outlined in Section 4.7 and in the Construction Erosion and Sediment Control Plan (Appendix 5).	No
Interfere with predicted or expected natural changes to the site (such as water dynamics or chemical composition)?	Potential impacts affecting surface water quality and hydrology (key indicators of conservation value) within the localised area of the proposed development will be avoided through implementation of control and protection measures. The risk of introduction and/or dispersion of non-native invasive species will be avoided by following the guidelines provided in the NRA 2010 guidelines. Best practice incorporated into the project design and required control measures are outlined in Section 4.7 and in the Construction Erosion and Sediment Control Plan (Appendix 5).	No
Reduce the area of key habitats?	The proposed road development is located 30km from the SAC. There will be no direct impact on key habitats within the SAC. Potential impacts affecting surface water quality and hydrology (key indicators of conservation value) within the localised area of the proposed development will be avoided through implementation of control and protection measures. Best practice incorporated into the project design and required control measures are outlined in Section 4.7 and in the Construction Erosion and Sediment Control Plan (Appendix 5).	No
Reduce the population of key species?	The will be no reduction in key floral species associated with the peatland habitats. Best practice incorporated into the project design and required control measures are outlined in Section 4.7 and in the Construction Erosion and Sediment Control Plan (Appendix 5).	No

Does the project have the potential to:	Potential Adverse Effects and Control Measure Assessment	Residual Impact Yes or No
Change the balance between key species?	The will be no change in balance between key floral species associated with the peatland habitats. Best practice incorporated into the project design and required control measures are outlined in Section 4.7 and in the Construction Erosion and Sediment Control Plan (Appendix 5).	No
Reduce diversity of the site?	Three will be ne reduction in diversity of the site. Best practice incorporated into the project design and required control measures are outlined in Section 4.7 and in the Construction Erosion and Sediment Control Plan (Appendix 5).	No
Result in disturbance that could affect population size or density or the balance between key species?	There is no potential for disturbance related impacts given the nature of the QIs and the distance from the SAC (i.e. 30km hydrologically).	No
Result in fragmentation?	The proposed road development is located 30km hydrologically upstream from the SAC. There is no potential for habitat or species fragmentation.	No
Result in loss or reduction of key features (e.g. tree cover, tidal exposure, annual flooding, etc.)?	No Key features will be lost as a result of construction or operation of the proposed development.	No

Having regard to the above, the proposed road development, individually or in combination with other plans and projects, in light of best scientific knowledge in the field, will not, in view of the sites' conservation objectives, adversely affect the integrity of Lough Forbes Complex SAC, and no reasonable scientific doubt remains as to the absence of such effects.

6.4.5 Integrity of Bellanagare Bog SPA (004105)

Based on the objective information gathered and the predictions made about the changes that are likely to result from the construction and operation stages of the project, the integrity of site checklist, as per Box 10 of EC, 2001, is completed, assessing potential adverse impacts and control measures incorporated into the project design, in Table 6.5 below.

Table 6.5 Integrity of Site Checklist and Assessment for Bellanagare Bog SPA

Does the project have the potential to:	Potential Adverse Effects and Control Measure Assessment	Residual Impact Yes or No
Conservation Objectives		
Cause delays in progress towards achieving the conservation objectives of the site?	The potential for loss and/or disturbance of key species will be avoided. The development will not cause delays in achieving the conservation objectives of the site. Best practice incorporated into the project design and required control measures are outlined in Section 4.7 and in the Construction Erosion and Sediment Control Plan (Appendix 5).	No
Interrupt progress towards achieving the conservation objectives of the site?	The potential for loss and/or disturbance of key species will be avoided and will not cause delays in achieving the conservation objectives of the site. Best practice incorporated into the project design and required control measures are outlined in Section 4.7 and in the Construction Erosion and Sediment Control Plan (Appendix 5).	No
Disrupt those factors that help to maintain the favourable conditions of the site?	Potential impacts affecting hydrology (a key indicator of conservation value) within the localised area of the proposed development will be avoided. Best practice incorporated into the project design and required control measures are outlined in Section 4.7 and in the Construction Erosion and Sediment Control Plan (Appendix 5). The risk of introduction and/or dispersion of non-native invasive species will be avoided by following the guidelines provided in the NRA 2010 guidelines. An Invasive species Management Plan will be prepared in relation to the treatment of the identified stand of Knotweed in the townland of Vesnoy. Prior to any works being carried out, a pre-construction Invasive species survey will be undertaken to ensure that additional Invasive have not been introduced to areas within or close to the road footprint.	No
Interfere with the balance, distribution and density of key species that are the indicators of the favourable condition of the site?		No
Other Indicators		
Cause changes to the vital defining aspects (e.g. nutrient balance) that determine how the site functions as a habitat or ecosystem?	The proposed road development is located approx 500m from the SPA at its closest point and is separated from it by existing forestry. No intensively managed wet grassland habitats were recorded within the construction footprint and it is unlikely that Greenland White Fronted Goose would utilise the road footprint outside the SPA. Consequently impacts on population trends and distribution are not anticipated. Best practice incorporated into the project design and required control measures are outlined in Section 4.7 and in the Construction Erosion and Sediment Control Plan (Appendix 5)	No
Change the dynamics of the relationships (between, for example, soil and water or plants and animals) that define the structure and/or function of the site?		No
Interfere with predicted or expected natural changes to the site (such as water dynamics or chemical composition)?		No

Does the project have the potential to:	Potential Adverse Effects and Control Measure Assessment	Residual Impact Yes or No
Reduce the area of key habitats?	The proposed road development is located 0.5km from the SPA. There will be no direct impact on the SPA. Potential impacts affecting peatland hydrology (a key indicator of conservation value) within the localised area of the proposed development will be avoided through implementation of control and protection measures. Best practice incorporated into the project design and required control measures are outlined in Section 4.7 and in the Construction Erosion and Sediment Control Plan (Appendix 5).	No
Reduce the population of key species?	The will be no reduction in key species associated with the SPA.	No
Change the balance between key species?	The will be no change in balance between key species associated with the SPA. Best practice incorporated into the project design and required control measures are outlined in Section 4.7 and in the Construction Erosion and Sediment Control Plan (Appendix 5).	No
Reduce diversity of the site?	There will be no reduction in diversity of the site. Best practice incorporated into the project design and required control measures are outlined in Section 4.7 and in the Construction Erosion and Sediment Control Plan (Appendix 5).	No
Result in disturbance that could affect population size or density or the balance between key species?	There is no potential for disturbance or fragmentation related impacts given that the SCI species no longer utilise the SPA.	No
Result in fragmentation?		No
Result in loss or reduction of key features (e.g. tree cover, tidal exposure, annual flooding, etc.)?	No Key features will be lost as a result of construction or operation of the proposed development.	No

Having regard to the above, the proposed road development, individually or in combination with other plans and projects, in light of best scientific knowledge in the field, will not, in view of the sites' conservation objectives, adversely affect the integrity of Bellanagare Bog SPA, and no reasonable scientific doubt remains as to the absence of such effects.

6.4.6 Integrity of Lough Gara SPA (004048)

Based on the objective information gathered and the predictions made about the changes that are likely to result from the construction and operation stages of the project, the integrity of site checklist, as per Box 10 of EC, 2002, is completed, assessing potential adverse impacts and control measures incorporated into the project design, in Table 6.6 below.

Table 6.6 Integrity of Site Checklist and Assessment for Lough Gara SPA

Does the project have the potential to:	Potential Adverse Effects and Control Measure Assessment	Residual Impact Yes or No
Conservation Objectives		
Cause delays in progress towards achieving the conservation objectives of the site?	The potential for loss and/or disturbance of key species will be avoided. The development will not cause delays in achieving the conservation objectives of the site. Best practice incorporated into the project design and required control measures are outlined in Section 4.7 and in the Construction Erosion and Sediment Control Plan (Appendix 5).	No
Interrupt progress towards achieving the conservation objectives of the site?	The potential for loss and/or disturbance of key species will be avoided and will not cause delays in achieving the conservation objectives of the site. Best practice incorporated into the project design and required control measures are outlined in Section 4.7 and in the Construction Erosion and Sediment Control Plan (Appendix 5).	No
Disrupt those factors that help to maintain the favourable conditions of the site?	Potential impacts affecting groundwater and surface water quality (a key indicator of conservation value) within the localised area of the proposed development will be avoided through implementation of control and protection measures. Likewise, the risk of introduction and/or dispersion of non-native invasive species will be avoided by following the guidelines provided in the NRA 2010 guidelines. Best practice incorporated into the project design and required control measures are outlined in Section 4.7 and in the Construction Erosion and Sediment Control Plan (Appendix 5).	No
Interfere with the balance, distribution and density of key species that are the indicators of the favourable condition of the site?		No
Other Indicators		
Cause changes to the vital defining aspects (e.g. nutrient balance) that determine how the site functions as a habitat or ecosystem?	Potential impacts affecting the supporting habitat of SCI species including surface water pollution and hydrological change resulting from road construction and operation have been avoided through implementation of control and protection measures. Best practice incorporated into the project design and required control measures are outlined in Section 4.7 and in the Construction Erosion and Sediment Control Plan (Appendix 5)	No
Change the dynamics of the relationships (between, for example, soil and water or plants and animals) that define the structure and/or function of the site?		No
Interfere with predicted or expected natural changes to the site (such as water dynamics or chemical composition)?		No

Does the project have the potential to:	Potential Adverse Effects and Control Measure Assessment	Residual Impact Yes or No
Reduce the area of key habitats?	The proposed road development is located 2.4km from the SPA. There will be no direct impact on the SPA. . Potential indirect uncontrolled impacts may occur through pollution of ground water and surface watercourses during the construction and operational phase. This could impact on SCI species downstream of the proposed development. However these impacts can be effectively controlled. Best practice incorporated into the project design and required control measures are outlined in Section 4.7 and in the Construction Erosion and Sediment Control Plan (Appendix 5).	No
Reduce the population of key species?	There will be no direct impacts on populations of key species. Potential indirect uncontrolled impacts may occur through pollution of ground water and surface watercourses during the construction and operational phase. This could impact on SCI species downstream of the proposed development. However these impacts can be effectively controlled. Best practice incorporated into the project design and required control measures are outlined in Section 4.7 and in the Construction Erosion and Sediment Control Plan (Appendix 5).	No
Change the balance between key species?	The will be no change in balance between key species associated with the SPA. Best practice incorporated into the project design and required control measures are outlined in Section 4.7 and in the Construction Erosion and Sediment Control Plan (Appendix 5).	No
Reduce diversity of the site?	Potential indirect uncontrolled impacts may occur through pollution of ground water and surface watercourses during the construction and operational phase. This could impact on the diversity of the SPA downstream of the proposed development. However these impacts can be effectively controlled. Best practice incorporated into the project design and required control measures are outlined in Section 4.7 and in the Construction Erosion and Sediment Control Plan (Appendix 5).	No
Result in disturbance that could affect population size or density or the balance between key species?	There is no potential for disturbance or fragmentation related impacts.	No
Result in fragmentation?		No
Result in loss or reduction of key features (e.g. tree cover, tidal exposure, annual flooding, etc.)?	No Key features will be lost as a result of construction or operation of the proposed development.	No

Having regard to the above, the proposed road development, individually or in combination with other plans and projects, in light of best scientific knowledge in the field, will not, in view of the sites' conservation objectives, adversely affect the

integrity of Lough Gara SPA, and no reasonable scientific doubt remains as to the absence of such effects.

6.5 Concluding Statement

The proposed road development, by itself or in combination with other plans and projects, in light of best scientific knowledge in the field, will not, in view of the sites' conservation objectives, adversely affect the integrity of any European Site and no reasonable scientific doubt remains as to the absence of such effects..

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