

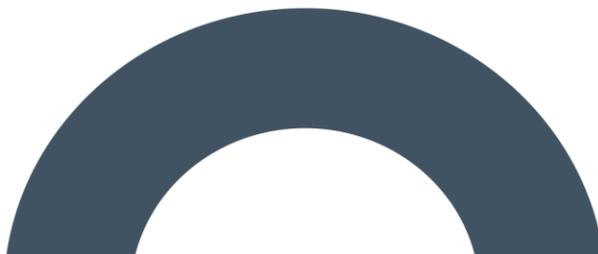


## APPENDIX 4-2

*REPLANTING ASSESSMENT INCLUDING  
AA SCREENING*

## Assessment of Proposed Replanting Lands

Curraglass Renewable Energy  
Development, Co. Cork





## DOCUMENT DETAILS

Client: **Wingleaf Ltd.**

Project Title: **Curraglass Renewable Energy Development, Co. Cork**

Project Number: **190301**

Document Title: **Assessment of Proposed Replanting Lands**

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## 1. INTRODUCTION

### 1.1 Introduction

This report has been prepared by McCarthy Keville O'Sullivan Ltd. (MKO) on behalf of Wingleaf Ltd., who intends to apply to Cork County Council for planning permission to construct a renewable energy development and all associated infrastructure in the townlands of of Cappaboy Beg, Derreendonee and Curraglass, Co. Cork.

The total replanting requirement for the proposed Curraglass Renewable Energy Development is 14.23 hectares (ha). Two potential replanting areas have been identified for assessment purposes, with a combined availability of 24.93 ha. These lands have been granted Forest Service Technical Approval for afforestation (see Appendix 1 for technical approval documents) and these or similarly approved will be used for replanting should the renewable energy project receive planning permission. A description of the proposed replanting lands and an assessment of the potential impacts associated with afforestation at each location are provided in this document.

### 1.2 Report Structure

The main sections of this report are presented as follows:

- > Section 2: Project Background and Description
- > Section 3: Planning Policy and Planning History
- > Section 4: Impact Assessment Methodology
- > Section 5: Biodiversity
- > Section 6: Land, Soils and Geology
- > Section 7: Hydrology and Hydrogeology
- > Section 8: Landscape
- > Section 9: Cultural Heritage
- > Section 10: Air, Climate and Noise
- > Section 11: Population & Human Health
- > Section 12: Material Assets

## 2. PROJECT BACKGROUND AND DESCRIPTION

### 2.1 Background

#### 2.1.1 Replanting Approval

Replanting or off-site afforestation is a requirement of the Forestry Act 2014 and its consent is regulated under the Forestry Regulations 2017 (SI 191/2017 which set out the provisions for licensing for afforestation.

Approval for afforestation is not granted by the Forest Service on lands where there is the potential for significant environmental impacts.

The lands addressed in this document have either been granted or will be granted Technical Approval by the Forest Service for afforestation. The properties at Sheehaun and Cloghaun More are new acquisitions and have received Technical Approval.

To afforest any land where the area involved is greater than 0.1 ha requires the approval of the Minister for Agriculture, Food and the Marine, under the 2017 Regulations. The application for approval is known as Pre-Planting Approval – Form 1 and is subject to the following procedures:

- The application is referred to the relevant Forest Service Inspector for assessment and recommendations;
- If there are any environmental considerations identified, the application is referred to the relevant external body, e.g. National Parks and Wildlife Services, National Monuments Service, Regional Fisheries Boards, Local Authorities, etc., for consideration;
- If the proposed development is greater than 25 hectares the application is referred to the relevant Local Authority;
- If the site is greater than 2.5 hectares the application is advertised on the Department’s website; and
- If the site is greater than 50 hectares an Environmental Impact Assessment and planning permission are required.

The Pre-Planting Approval – Form 1 requires a wide range of details in relation to the proposed area to be forested. Notwithstanding the size of the proposed application, the environmental considerations which must be answered/considered for the approval are listed in Table 2-1 below. The Pre-Planting Approval – Form 1 notes that, if present, all items listed may require the Department of Agriculture, Food and the Marine (DAFM) to consult with prescribed bodies, while those in bold type may require the DAFM to undertake public consultation.

Table 2-1 Environmental Considerations in Afforestation Applications for Approval - Form 1

	Environmental Considerations
1	Water Quality
1.1	Is the area designated potentially acid sensitive by this Department (DAFM)?
1.2	Is the area >5 ha and sensitive for fisheries?
1.3	Is the area non-sensitive for fisheries and >40 ha?
1.4	Is the area >10 ha and within a catchment area of a Local Authority designated water scheme?
2	Designated Habitats
2.1	Is the area within a NHA, pNHA, SAC, SPA or National Park?
2.2	If the area is within an NHA, is a completed notifiable Action Form/ Action Requiring Consent Form (consent from National Parks and Wildlife Service) included?
2.3	If the area within a Hen Harrier SPA, will operations occur between the 1 <sup>st</sup> of April and the 15 <sup>th</sup> August inclusive?

Environmental Considerations	
2.4	Is the area within a NPWS referral zone for NHA, pNHA, SAC or SPA?
2.5	Is the area within 3 km upstream of a NHA, pNHA, SAC, SPA or National Park?
2.6	Is the area within a Fresh Water Pearl Mussel 6 km zone? If yes, the Forestry and Fresh Water Pearl Mussel Requirements Forms A and B should be included with the Application
2.7	Is the area within a Freshwater Pearl Mussel Catchment?
2.8	Does the area contain a current REPS plan habitat?
3	Archaeology
3.1	Does the area contain an archaeological site or feature with intensive public usage?
3.2	Does the area contain or adjoin a listed archaeological site or monument?
4	Landscape
4.1	Is the area within a prime scenic area in the County Development Plan?
4.2	Are there any other High Amenity Landscape considerations?
5	Size for Notification to Local Authority
5.1	Is the area greater than 25 ha?
6	Other Environmental Considerations
6.1	Specify

## 2.2 Proposed Replanting Lands

Two potential areas have been identified for assessment purposes, and any replanting associated with the Curraglass Renewable Energy Development will take place at these lands or similarly Technically Approved lands. The list of Technically Approved lands assessed in this report is presented in Table 2-2.

Table 2-2 Technically Approved Replanting Lands

Location No.	Site Name	Location	Proposed Replanting Areas (ha) <sup>1</sup>
1	Sheehaun	Co. Roscommon	7.73
2	Cloghaun More	Co. Clare	17.22
<b>Total Area</b>			<b>24.95</b>

Notes:

1. All areas are approximate.

The lands at Sheehaun and Cloghaun More listed in Table 2-2 have been assessed as part of the Afforestation Approval - Form 1 process and obtained Technical Approval for Afforestation from the Forest Service. The combined approved area for replanting afforestation at the sites is 24.95 ha, which is available to the applicant and would meet the total Curraglass Renewable Energy Development replanting requirement of 14.23 ha. Site location maps and further details on each site are provided in Sections 2.2.1 and 2.2.2 below.

### 2.2.1 Replanting Area 1: Sheehaun, Co. Roscommon

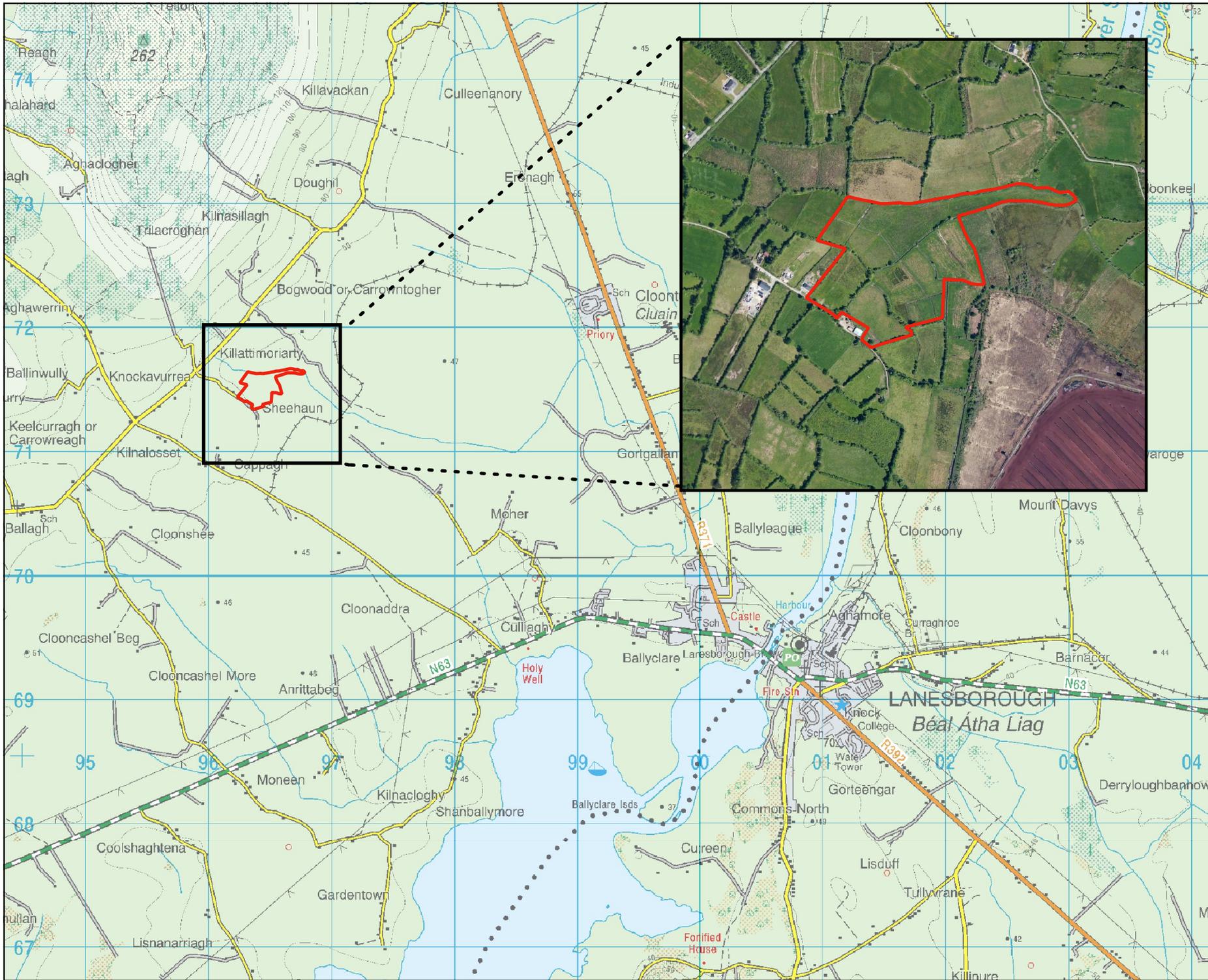
This replanting area is in the townland of Sheehaun, Co. Roscommon. The Sheehaun site is located approximately 3.5 kilometres to the northwest of Lanesborough, Co. Longford and 10 kilometres to the northeast of Roscommon town, Co. Roscommon.

The site location map and aerial photograph view are presented in Figure 2-1. The Technical Approval area for afforestation at Sheehaun measures 7.73 hectares in total. The proposed replanting site is accessed from a local road to the west of the site. The current land use is agricultural for pastoral farming. Existing forestry sites lie adjacent to the east.

### 2.2.2 **Replanting Area 2: Cloghaun More, Co. Clare**

This replanting area is in the townland of Cloghaun More, Co. Clare. The Cloghaun More site is located approximately 6 kilometres to the northeast of Doonbeg, Co. Clare and 8.5 kilometres to the northwest of Kilmihil, Co. Clare.

The site location and aerial photograph view are presented in Figure 2-2. The Technical Approval area for afforestation at this site is 17.22 hectares. The proposed replanting site is accessed from the R483 that runs through the centre of the site. The current land use is agricultural for pastoral farming. Existing forestry sites lie adjacent to the northwest and the south



**Map Legend**

 Site Boundary



Drawing Title  
**Site Location - Sheehaun, Co. Roscommon**

Project Title  
**Curraglass Renewable Energy Development, Co. Cork**

Drawn By  
**Órla Murphy**

Checked By  
**Michael Watson**

Project No.  
**190301**

Drawing No.  
**Figure 2-1**

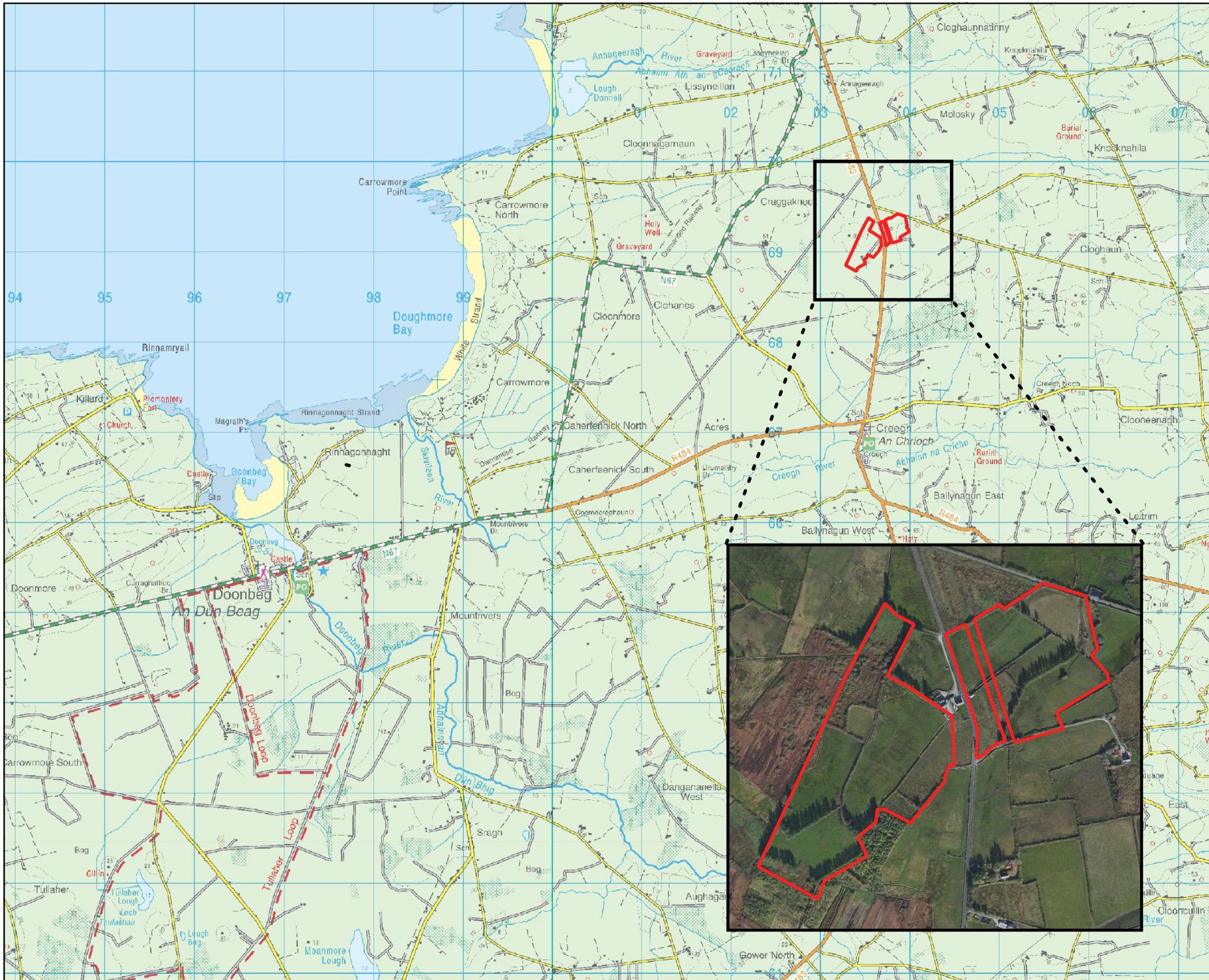
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Date  
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### Map Legend

 Site Boundary



Drawing Title  
**Site Location - Cloghaun More,  
 Co. Clare**

Project Title  
**Curraglass Renewable Energy  
 Development, Co. Cork**

Drawn By  
**Órla Murphy**

Checked By  
**Michael Watson**

Project No.  
**190301**

Drawing No.  
**Figure 2-2**

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Date  
**22.05.2020**



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## 2.3 Proposed Afforestation Techniques

### 2.3.1 Forest Service Best Practice

Afforestation and subsequent harvesting will conform to current best practice Forest Service regulations, policies and strategic guidance documents as well as Coillte and DAFM produced guidance documents, including the specific guidelines listed below, to ensure that newly planted trees remain viable and afforestation provide minimal potential impacts to the receiving environment.

- Environmental Requirements for Afforestation (Forest Service, 2016a)
- Land Types for Afforestation (Forest Service, 2016b)
- Forest Protection Guidelines (Forest Service, 2002)
- Forestry Harvesting and the Environment Guidelines (Forest Service, 2000a)
- Forest Operations and Water Protection Guidelines (Coillte, 2013)
- Forestry and Water Quality Guidelines (Forest Service, 2000b)
- Forestry and the Landscape Guidelines (Forest Service, 2000c)
- Forestry and Archaeology Guidelines (Forest Service, 2000d)
- Forest Biodiversity Guidelines (Forest Service, 2000e)
- Forests and Water, Achieving Objectives under Ireland's River Basin Management Plan 2018-2021 (DAFM, 2018)

Planting will be carried out in accordance with the *Forestry Schemes Manual* (Forest Service, 2011), which provides guidance in relation to ground cultivation, stocking and spacing, plant handling, planting dates, fertiliser application, fencing, fire, and weed control. Certain specific silvicultural and environmental conditions are also set out in the Forest Service Technical Approvals for each site, which will be adhered to.

### 2.3.2 Planting

Planting will be by hand. The main forms of planting, as described in the Forestry Schemes Manual, are set out as follows.

#### Slit Planting

A spade is used to make a vertical slit in the ground. The trees roots are carefully positioned in the slit to ensure that roots are equally spaced in the vertical slit created. The slit is closed and firmed up ensuring the tree is vertical and upright. It is important to ensure that roots are not bent over which can lead to poor development, e.g. J root. This form of planting can be suitable for ribbons, mounds and ripped ground.

#### Angle Notch

A spade is used to cut a T or L-shaped slit in the ground. The spade is used to lift the slit and the trees roots placed underneath to ensure good root distribution without causing damage. The slit is closed and firmed up to ensure that stem is left vertical and upright.

#### Pit Planting

A spade is used to dig a hole and the trees roots placed in the centre. Soil is placed around the tree and firmed in, ensuring that it is upright and straight. This form of planting can be used in sensitive sites where no ground preparation has taken place. It may also be appropriate for steep slopes where other types of preparation may lead to sediment run off.

The Technical Approvals for the proposed replanting lands include the species approved for afforestation.

### 2.3.3 Drainage

Drainage and sediment control at each site will conform to Forest Service best practice. Appropriate drainage designs will include collector drains, interceptor drains and cut-off drains. A description of each drain type, as per the Forestry Schemes Manual, is set out below. Figure 2-' presents a schematic diagram of each drain type.

#### Collector Drains

Collector drains collect water from mound drains, plough furrows, mole drains, etc., and discharge via sediment traps and/or an interceptor drain. Collector drains are excavated to a depth not greater than 10-15 cm below the depth of mound drains. Where collector drains have to be extended into erodible material, 'mini' silt traps are placed appropriately by deepening the drains in places.

#### Interceptor Drains

Interceptor drains are constructed along the edges of aquatic buffer zones, i.e. areas where forest operations are curtailed and which are managed for environmental protection and enhancement. Interceptor drains collect the discharge from the drainage sub-catchment and allow it to overflow into the buffer zone. In most cases, slope will allow for drainage channels to taper out or be connected to an interceptor drain rather than enter a buffer zone. However, on flat sites, or those with low slopes, it will be necessary to connect drains into the aquatic zone. This may be done only where it will not result in sediment or any pollutants entering the aquatic zone.

#### Cut off Drains

Cut off drains are constructed immediately up slope of a site and are designed to direct water away from the site.

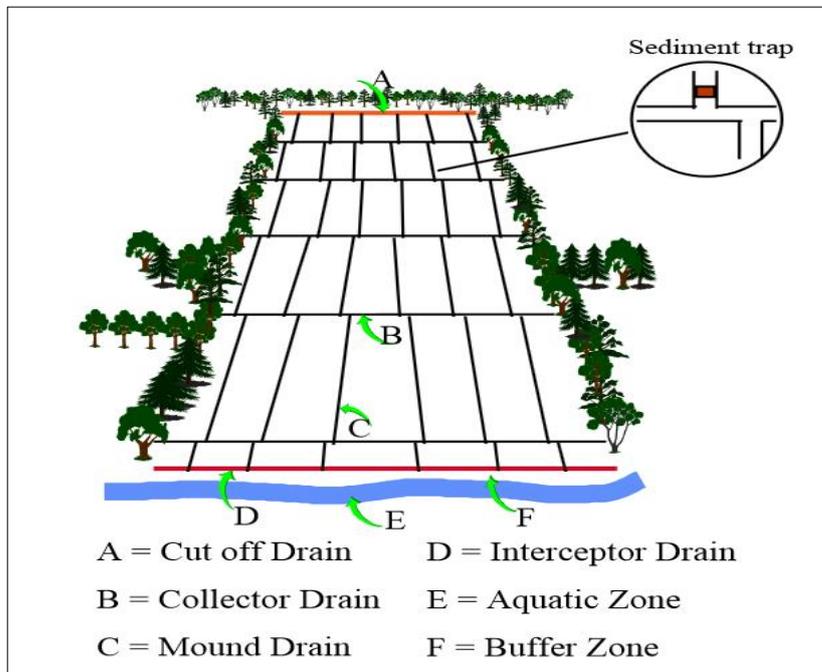


Figure 2-3 Standard Forestry Drainage (Forest Service, 2011)

Designs similar to the one above may be suitable for steeper erodible sites.

### 3. PLANNING POLICY AND PLANNING HISTORY

This section contains relevant national and local policies regarding forestry. This includes reference to several national forestry policy documents, the *Climate Action Plan 2019* (Department of Communications, Climate Action & Environment, 2019) as well as County Development Plans for Roscommon and Clare.

This section of the report also addresses the planning history within, and in the vicinity of, the proposed replanting lands.

#### 3.1 Planning Policy

##### 3.1.1 National Policy

National policy includes Forest Service policy as well as policy on climate change. Forestry policy in Ireland is overseen by the Forest Policy Section of the DAFM. At a European and international level, the Forest Policy Section is responsible for the transposition of EU directives and regulations into Irish law, as well as representing the Forest Service at a European level. On a national level, the Forest Policy Section deals with issues relating to climate change, carbon sequestration, wood energy, forestry and the environment, legislative framework and liaison with stakeholders which includes other government agencies.

National policy is aimed towards increasing Ireland's forest cover in a sustainable manner. The document *Forests, products and people: Ireland's forest policy – a renewed vision* (DAFM, 2014) sets out an updated national forest policy strategy that takes account of the substantial changes that have occurred in Irish forestry since the publication of its forerunner, *Growing for the Future* (DAFM, 1996). As part of the Department's policy to ensure compatibility between forestry development and the protection of the environment, the Forest Service is implementing Sustainable Forest Management (SFM) with a view to ensuring that all timber produced in Ireland is derived from sustainably managed forests. This work is in accordance with Ireland's commitment to the six pan-European criteria for SFM adopted at the Third Ministerial Conference on the Protection of Forests in Europe, Lisbon, 1998. The implementation of SFM within Ireland is supported by the Irish National Forest Standard, the *Code of Best Forest Practice* and a suite of environmental guidelines (relating to water quality, landscape, archaeology, biodiversity and harvesting) as well as the work of the Forestry Inspectorate and the ongoing review of Irish forest legislation.

The *Environmental Requirements for Afforestation* (Forest Service, 2016a), released in December 2016, incorporate more recent developments in relation to environmental regulation, research and changes in forest practices, and consolidate into one single coherent document those measures and safeguards relating to afforestation which were previously contained within the following Forest Service Environmental 'Guidelines': *Forestry and Water Quality Guidelines*, *Forestry and Archaeology Guidelines*, *Forestry and the Landscape Guidelines*, and *Forest Biodiversity Guidelines*. The use of the word 'requirements' in the title was selected over 'guidelines', in order to underline the mandatory nature of the measures therein.

These environmental guidelines are referred to in Section 3.1.3 below.

##### 3.1.1.1 Forests, products and people: Ireland's forest policy – a renewed vision

This document, published in 2014 by DAFM, contains strategic goals and recommendations of the Forest Policy Review Group. The strategic goal is defined as:

*“Develop an internationally competitive and sustainable forest sector that provides a full range of economic, environmental and social benefits to society and which accords with the Forest Europe definition of sustainable development.”*

The report notes the increasing economic, environmental and social role of forestry in Ireland, stating that forestry accounts for 10.8% of the land area of the country, which is low in comparison with other European countries. The strong forest growth rates found in Ireland when compared to other European countries is also noted. The role of forestry in rural development and diversification as well as rural employment is also recognised.

The document also notes the contribution of forests to mitigation of climate change through carbon sequestration and notes that Irish forests will sequester approximately 4.8 million tonnes of CO<sub>2</sub> in 2020. This document's afforestation policy therefore supports Ireland's efforts to reach the greenhouse gas emission reduction targets as well as reducing dependence on fossil fuels.

The role of the forest resource in contributing to the renewable energy policy goals, such as achieving a percentage of power generation by co-firing with biomass, as well as biomass in power generation, is also noted. The report notes that the contribution of forestry to achieving renewable energy targets is dependent on the scale and accessibility of the resource, and that a continuation of afforestation in order to maintain a sustainable level of supply of small roundwood would result in confidence for investment in Combined Heat and Power (CHP) and other wood energy technologies.

Some recommended relevant policies and actions include:

- **Expansion of the Forest Resource:** To increase the forest area, in accordance with SFM principles, in order to support a long term sustainable roundwood supply of 7 to 8 million cubic metres per annum. This policy aims to increase afforestation to 15,000 hectares annually.
- **Management of the Resource:** To ensure that the sustainable management of the forest resource in accordance with best practice thereby ensuring its capacity to provide the full range of timber and other benefits.
- **Environment and Public Goods:** To ensure that afforestation, management of existing forests and development of the forest sector are undertaken in a manner that enhances their contribution to the environment and the capacity to provide public goods and services.

### 3.1.1.2 Forestry Programme 2014-2020

This document was submitted in accordance with EU Guidelines on State Aid for Agriculture and Forestry in Rural Areas 2014-2020 and represents Ireland's proposals for 100% State aid funding for a new forestry programme 2014-2020. These measures are consistent with the document *Forests, products and people; Ireland's forest policy - a renewed vision* as referred to in Section 3.1.1.1 above.

This document contains a number of responses to the actions and policies identified in the above document, and these include an Afforestation scheme - this is the main response to the policy entitled '*Expansion of the forest resource*'.

An identification of needs was carried out by DAFM in relation to forestry, and these needs are as follows:

- Increase, on a permanent basis, Ireland's forest cover to capture carbon, produce wood and help mitigation;
- Increase and sustain the production of forest-based biomass to meet renewable energy targets;
- Support forest holders to actively manage their plantations; and
- Optimise the environmental and social benefits of new and existing forests.

A number of measures are proposed to meet these needs, and the most relevant of these refers to the first measure, which is aimed at increasing Ireland's forest cover (currently at approximately 10.8%) which is well below the EU average of 38%. The aim is to increase forest cover to 18% by the mid-century. The second need, that to increase forest-based biomass in order to meet the stated targets for renewable energy by 2020.

### 3.1.1.3 Climate Action Plan 2019

The *Climate Action Plan* (DCCA, 2019) which features 183 action plans sets out how Ireland will meet its EU targets to reduce its carbon emissions by 30% between 2021 and 2030 and lay the foundations for achieving net zero carbon emissions by 2050. One of the key targets in relation to forestry is the delivery of ‘...an average of 8,000 ha per annum of newly planted forest, and sustainable forest management of existing forests (21 MtCO<sub>2</sub>eq. cumulative abatement)’. Ongoing and proposed measures to deliver the target include:

- The investment of nearly €3 billion in forestry, since the late 1980s, which through ongoing sustainable forest management will contribute to delivering abatement of 21 MtCO<sub>2</sub>eq over the period 2021 to 2030.
- Review of the current afforestation programme to enhance participation rates, and inform land use policy to increase the benefits for climate, the environment, and rural communities.
- Commitment by Coillte to replant or restock a total of 34,770 hectares between 2016 and 2020.
- Bord na Móna’s estate extends to a little under 80,000 ha. To date a little over 18,000 ha of the cut-away and cut-over peatland has been rehabilitated and the target for 2019 is to complete a further 3,000 ha. By way of additional context, as much as 50,000ha of the overall estate is currently under consideration for a wide variety of commercial future uses of which renewable energy projects constitute the greatest proportion by far.
- Hedgerows are estimated to cover 3.9% of the Irish landscape or 660,000 km length. The total area of hedgerow and non-forest woodland patches across the landscape could possibly represent a significant carbon sink and could potentially be used as a mitigation option.

## 3.1.2 Local Policy

### 3.1.2.1 Clare County Development Plan

The *Clare County Development Plan 2017 - 2023* (Clare County Council, 2017) contains a number of policies and objectives relating to natural resources and forestry. The County Clare Landscape Character Assessment and general policies on landscape are also referred to in Section 8 of this report.

Chapter 10 of the Clare County Development Plan contains objectives regarding Natural Resources, and notes that Clare is the fourth most afforested County and recognises the potential for job creation within the forestry sector and related industries. The Plan states that the Council will support the diversification and sustainable development of appropriate lands to forestry and associated enterprises subject to normal landscape and ecological considerations. Objective 10.7 is:

*“To facilitate, encourage and appropriately manage the development of natural resources of the county and to ensure that this is done in a sensitive way, eliminating any significant adverse effects on the natural environment and in compliance with all relevant legislation, as set out in Objective CDP2.1.”*

The Plan refers to the forestry sector as the largest and most readily available biomass resource and also refers to the scope for wood to replace dependence on fossil fuels, as well as potential economic and social gains. The Plan states that the Council will seek to actively encourage and facilitate where appropriate the sustainable development of the forestry sector in a scale and manner which maximizes its contribution to the local rural economy. The Plan also notes the role of forestry in Bioenergy. Objective 10.9 states it is an objective of Clare County Council:

- a) *To promote and encourage state and private afforestation and reforestation throughout the countryside in appropriate locations, in compliance with Objective CDP2.1, and on suitable soil types as a means of promoting rural diversity and strengthening both the rural and urban economy;*
- b) *To support the development of enterprises ancillary to the forestry industry, in particular value-improvement enterprises relating to timber extracted from County Clare forests;*

- c) *To encourage the sustainable development of native woodlands to enhance biodiversity, the landscape and recreational amenity, to provide climate change mitigation and an education resource and to strengthen the rural economy.*

The plan also notes the role that forestry can play in tourism, with Objective 9.10 stating:

*“It is an objective of Clare County Council to work in collaboration with Coillte, private forestry owners, community organisations and other interested parties to develop new forest accommodation, access, signage and trails for walking, cycling, mountain-biking and horse-riding (bridle paths).”*

### 3.1.2.2 Roscommon County Development Plan

The Roscommon County Development Plan 2014 contains information and objectives relating to forestry, in terms of promoting and controlling afforestation. The Roscommon Landscape Character Assessment is also a source of information and is referred to in further detail in Section 8 of this document.

Chapter 3 of the Roscommon County Development Plan and contains objectives regarding Natural Resources. The Plan states that over 21,000ha of forestry has been planted in County Roscommon, representing 8.7% of the total area of the County.

Roscommon County Council recognizes the many benefits of forestry within the County in terms of economic, recreational and carbon sequestration potential, and acknowledges the potential for further afforestation in County Roscommon.

The Planning and Development (Amendment) (No. 2) Regulations 2011 transferred management of development for initial afforestation from the relevant Planning Authorities to the Forest Service (part of the Department of Agriculture, Food and the Marine). Roscommon County Council as the relevant local authority is now a consultation body and in this role the Planning Authority submit observations on applications for initial afforestation where appropriate.

### 3.1.3 Forest Service Guidelines

The *Environmental Requirements for Afforestation* (Forest Service, 2016a), released in December 2016, incorporate more recent developments in relation to environmental regulation, research and changes in forest practices, and consolidate into one single coherent document those measures and safeguards relating to afforestation which were previously contained within the following Forest Service Environmental Guidelines: *Forestry and Water Quality Guidelines*, *Forestry and Archaeology Guidelines*, *Forestry and the Landscape Guidelines*, and *Forest Biodiversity Guidelines*. The use of the word ‘requirements’ in this document’s title was selected over ‘guidelines’, in order to underline the mandatory nature of the measures therein.

The overall aim of the *Environmental Requirements for Afforestation* is to ensure that the establishment of forests is carried out in a way that is compatible with the protection and enhancement of the environment, in regard to water quality, biodiversity, archaeology, landscape and other environmental receptors. In relation to water, the focus is on reducing and eliminating sources of pollution and preventing the creation of pathways to receiving waters. The Requirements provide an enhanced baseline level of protection regarding afforestation and water, with the water setback representing an important feature. They will also support the *Plan for Forestry and Freshwater Pearl Mussel in Ireland* (DAFM, 2016), by providing an enhanced baseline level of protection regarding afforestation and water.

The *Environmental Requirements for Afforestation* are set out in three stages that reflect the project development process, i.e. pre-application design, site works, and ongoing site management. While some overlap exists, these three stages reflect the typical sequence of activities undertaken by an Applicant and her / his Registered Forester, and the corresponding sequence of mandatory environmental measures that apply, throughout afforestation up until the end of the premium period (or 15 years, for non-grant aided forests).

Afforestation at the proposed replanting lands will be carried out in accordance with the *Environmental Requirements for Afforestation* document, as stated in the conditions attached to each Technical Approval.

### 3.2 Planning History

A planning history search was carried out for the proposed replanting lands and the lands in their immediate vicinity. This entailed reference to the Planning Application search facility and maps on the website of each relevant Planning Authority, i.e. Clare County Council and Roscommon County Council. The planning history searches found that planning applications in the vicinity of the proposed replanting lands relate to one-off houses. No projects or plans were identified that would be incompatible with the proposed replanting or give rise to significant cumulative impacts.

## 4. IMPACT ASSESSMENT METHODOLOGY

The impacts of afforestation at the potential replanting lands described in Section 2.2 of this report have been assessed under the following key environmental headings:

- > Biodiversity
- > Land, Soils and Geology
- > Hydrology and Hydrogeology
- > Landscape
- > Cultural Heritage
- > Air, Climate and Noise
- > Human Beings
- > Material Assets

Each site is addressed separately under the key environmental headings, and described in terms of Baseline Environment, Impact Assessment, Proposed Mitigation Measures and Residual Impacts and Significance of Effects. The findings of the assessment are presented in Sections 5 to 12 of this report.

Impacts are described in terms of quality, significance, duration and type, where possible. The classification of impacts in this report uses the standard best-practice terms provided in the Environmental Protection Agency (EPA) document, *Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* (EPA, 2017). Table 1-2 (pp. 1-16 to 1-19) of the Environmental Impact Assessment Report (EIAR) submitted as part of the Curraglass Renewable Energy Development planning application presents a copy of the impact classification terminology.

Appropriate mitigation measures are presented where relevant to reduce, remedy or eliminate potential impacts. Residual impacts are also presented following any impact for which mitigation measures are prescribed.

## 5. BIODIVERSITY

This report includes accurate descriptions of all aspects of the proposed afforestation. It then provides a comprehensive description of the baseline ecological environment, which is based on an appropriate level of survey work that was carried out in accordance with the most appropriate guidelines and methodologies. The assessment then completes a thorough assessment of the impacts of the proposed development on biodiversity. Where likely ecologically significant effects are identified, measures are prescribed to avoid or minimise or compensate for such effects associated with afforestation, at the following locations:

- > Sheehaun, Co. Roscommon
- > Cloghaun West, Co. Clare

### 5.1 Establishing the Zone of Influence

As described in the CIEEM, 2018 *Guidelines for Ecological Impact Assessment in The UK and Ireland*, 'the 'zone of influence' for a project is the area over which ecological features may be affected by biophysical changes as a result of the proposed project and associated activities'. The zone of influence will vary with different ecological features, depending on their sensitivities to an environmental change. This may extend beyond the project site, for example where there are ecological or hydrological links beyond the site boundaries.

The assessment of the site began with a desk study of available published data on sites designated for nature conservation, other ecologically sensitive sites, habitats and species of interest near the proposed development. A review of OSI mapping, online environmental web-mappers and ortho-photography was also undertaken. The baseline information obtained from the desk study was the first stage in defining a zone of influence of the proposed development.

The zone of likely influence for the proposed development varied depending on the ecological receptors identified on site. In the assessment, effects on habitats and species within the site were considered and also the potential for the proposed development to affect habitats and species outside the site.

### 5.2 Methodology and Limitations

### 5.3 Field Surveys

Ecological site visits were undertaken in March 2020. Habitats were identified in accordance with the Heritage Council's *'Guide to Habitats in Ireland'* (Fossitt, 2000), 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 multi-disciplinary walkover survey was designed to detect the presence, or likely presence, of a range of protected habitats and species. Incidental sighting/observations of birds and additional fauna were noted during the site visits. Surveys were undertaken in accordance with best practice guidance (TII, 2008: *Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes*). During the multi-disciplinary ecological walkover surveys the potential for the study area to support protected mammals listed in the Wildlife Acts, 1976-2018, such as pine marten, red squirrel, Irish hare, pygmy shrew, Irish stoat etc. was assessed.

During the multi-disciplinary walkover survey, a search for non-native invasive species was undertaken. The survey focused on the identification of invasive species listed under the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (As Amended) (S.I. 477 of 2015).

Features within the sites were visually assessed for potential as bat roosting habitat using a protocol set out in the Bat Conservation Trust (BCT) Bat Surveys for Professional Ecologists: good practice Guidelines (3<sup>rd</sup> edn.) (Collins, J (ed.), 2016). Table 4.1 of the BCT Guidelines identifies a grading protocol for

assessing structures, trees and commuting/foraging habitat for bats. The protocol is divided into four Suitability Categories: *High, Moderate, Low* and *Negligible*.

Seasonal factors that affect distribution patterns and habits of species were taken into account when conducting the surveys. The potential of the sites to support certain populations (in particular those of conservation importance that may not have been recorded during the field survey due to their seasonal absence or nocturnal/cryptic habits) was assessed. All habitats were readily identifiable, and it is considered that a comprehensive and accurate assessment of the habitats was achieved.

### 5.3.1 Desk Study

The following sections detail the results of the searches of published material that were consulted as part of the desk study. These included the Site Synopses of relevant designated sites as compiled by the National Parks and Wildlife Service (NPWS) of the Department of Culture Heritage, and the Gaeltacht (CHG) bird and plant distribution atlases and other research publications.

#### 5.3.1.1 Designated Sites

##### European Sites

The Habitats Directive (together with the Birds Directive) forms the cornerstone of Europe's nature conservation policy. It is built around two pillars: the Natura 2000 network of protected sites and the strict system of species protection. In total, the Habitats Directive protects over 1,000 animal and plant species and over 200 'habitat types' (e.g. special types of forests, meadows, wetlands, etc.), which are of European importance.

With the introduction of the EU Habitats Directive (92/43/EEC) and Birds Directive (79/409/EEC) which were transposed into Irish law as S.I. No. 94/1997 *European Communities (Birds and Natural Habitats) Regulations 1997*, the European Union formally recognised the significance of protecting rare and endangered species of flora and fauna, and also, more importantly, their habitats. The 1997 Regulations and their amendments were subsequently revised and consolidated in S.I. No. 477/2011- *European Communities (Birds and Natural Habitats) Regulations 2011*. This legislation requires the establishment and conservation of a network of sites of particular conservation value that are to be termed 'European Sites'. This includes Special Areas of Conservation and Special Protection Areas, as described below.

##### Special Areas of Conservation

Articles 3 - 9 of the EU Habitats Directive (92/43/EEC) provide 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.

##### Special Protection Areas

Council Directive 79/409/EEC of 2 April 1976 on the conservation of wild birds (Birds Directive) has been substantially amended several times. In the interests of clarity and rationality the said Directive was codified in 2009 and is now cited as Directive 2009/147/EC. The Directive instructs 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 have been identified in the Directive and are 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 classified for these Annex I listed species and for regularly occurring migratory species, paying particular attention to the protection of wetlands (Article 4).

### Nationally Designated Sites

Natural Heritage Areas (NHAs) and Proposed Natural Heritage Areas (pNHAs) 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.

## 5.3.2 Methodology for Assessment of Impacts and Effects

### 5.3.2.1 Geographical Framework

The importance of the ecological features identified within the study area was determined with reference to a defined geographical context. This was undertaken following a methodology that is set out in Chapter 3 of the 'Guidelines for Assessment of Ecological Impacts of National Roads Schemes' (NRA, 2009). These guidelines set out the context for the determination of value on a geographic basis, with a hierarchy assigned in relation to the importance of any particular receptor. The guidelines provide a basis for determination of whether any particular receptor is of importance on the following scales:

- International
- National
- County
- Local Importance (Higher Value)
- Local Importance (Lower Value)

The Guidelines clearly set out the criteria by which each geographic level of importance can be assigned. Locally Important (lower value) receptors contain habitats and species that are widespread and of low ecological significance and of any importance only in the local area. Internationally Important sites are either designated for conservation as part of the Natura 2000 Network (SAC or SPA) or provide the best examples of habitats or internationally important populations of protected flora and fauna. Specific criteria for assigning each of the other levels of importance are set out in the guidelines and have been followed in this assessment. Where appropriate, the geographic frame of reference set out above was adapted to suit local circumstances. In addition, and where appropriate, the conservation status of habitats and species is considered when determining the significance of ecological receptors.

Any ecological receptors that are determined to be of Local Importance (Higher Value), County, National or International importance following the criteria set out in NRA (2009) are considered to be Key Ecological Receptors (KERs) for the purposes of ecological impact assessment if there is a pathway for effects thereon. Any receptors that are determined to be of Local Importance (Lower Value) are not considered to be Key Ecological Receptors.

## 5.3.3 Characterisation of Impacts and Effects

The proposed development will result in a number of impacts. The ecological effects of these impacts are characterised as per the CIEEM 'Guidelines for Ecological Impact Assessment in the UK and Ireland' (2018). The headings under which the impacts are characterised follow those listed in the guidance document and are applied where relevant. A summary of the impact characteristics considered in the assessment is provided below:

- **Positive or Negative.** Assessment of whether the proposed development result in a positive or negative effect on the ecological receptor.
- **Extent.** Description of the spatial area over which the effect has the potential to occur.
- **Magnitude** to size, amount, intensity and volume. It should be quantified if possible and expressed in absolute or relative terms e.g. the amount of habitat lost, percentage change to habitat area, percentage decline in a species population.
- **Duration** is defined in relation to ecological characteristics (such as the lifecycle of a species) as well as human timeframes. For example, five years, which might seem short-term in the human context or that of other long-lived species, would span at least five generations of some invertebrate species.
- **Frequency and Timing.** This relates to the number of times that an impact occurs and its frequency. A small-scale impact can have a significant effect if it is repeated on numerous occasions over a long period.
- **Reversibility.** This is a consideration of whether an effect is reversible within a 'reasonable' timescale. What is considered to be a reasonable timescale can vary between receptors and is justified where appropriate in the impact assessment section of this report.

## 5.3.4 Determining the Significance of Effects

### 5.3.4.1 Impact Assessment – EPA Criteria (2017)

Impacts are identified as per the *Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* (EPA, 2017) and are shown below (Table 5-1).

Table 5-1 Impact Classification Terminology

Impact Characteristic	Term	Description
Quality	Positive	A change which improves the quality of the environment.
	Neutral	No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
	Negative	A change which reduces the quality of the environment.
Significance	Imperceptible	An effect capable of measurement but without significant consequences.
	Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
	Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
	Moderate	An effect that alters the character of the environment in a manner consistent with existing and emerging trends.
	Significant	An effect, which by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
	Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.

Impact Characteristic	Term	Description
	Profound	An effect which obliterates sensitive characteristics.
<b>Extent and Context</b>	Extent	Describe the size of the area, number of sites and the proportion of a population affected by an effect.
	Context	Describe whether the extent, duration, or frequency will conform or contrast with established (baseline) conditions.
<b>Probability</b>	Likely	The effects that can reasonably be expected to occur because of the development if all mitigation measures are properly implemented.
	Unlikely	The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.
<b>Duration and Frequency</b>	Momentary Effects	Effects lasting from seconds to minutes.
	Brief Effects	Effects lasting less than a day.
	Temporary Effects	Effects lasting less than a year.
	Short-term	Effects lasting one to seven years.
	Medium-term	Effects lasting seven to fifteen years.
	Long-term	Effects lasting fifteen to sixty years.
	Permanent	Effects lasting over sixty years.
	Reversible Effects	Effects that can be undone.
	Frequency	Describe how often the effect will occur. (once, rarely, occasionally, frequently, constantly - or hourly, daily, weekly, monthly, annually)
<b>Type</b>	Indirect Effects	Impacts on the environment, which are not a direct result of the project, often produced away from the project site or because of a complex pathway.
	Cumulative	The addition of many minor or significant effects to create one larger, more significant effect.

Impact Characteristic	Term	Description
	‘Do Nothing’	The environment as it would be in the future should no development of any kind be carried out.
	Indeterminable	When the full consequences of a change in the environment cannot be described.
	Irreversible	When the character, distinctiveness, diversity, or reproductive capacity of an environment is permanently lost.
	Residual	Degree of environmental change that will occur after the proposed mitigation measures have taken effect.
	Synergistic	Where the resultant effect is of greater significance than the sum of its constituents.
	‘Worst Case’	The effects arising from a development in the case where mitigation measures substantially fail.

## 5.4 Replanting Site 1: Sheehaun, Co. Roscommon

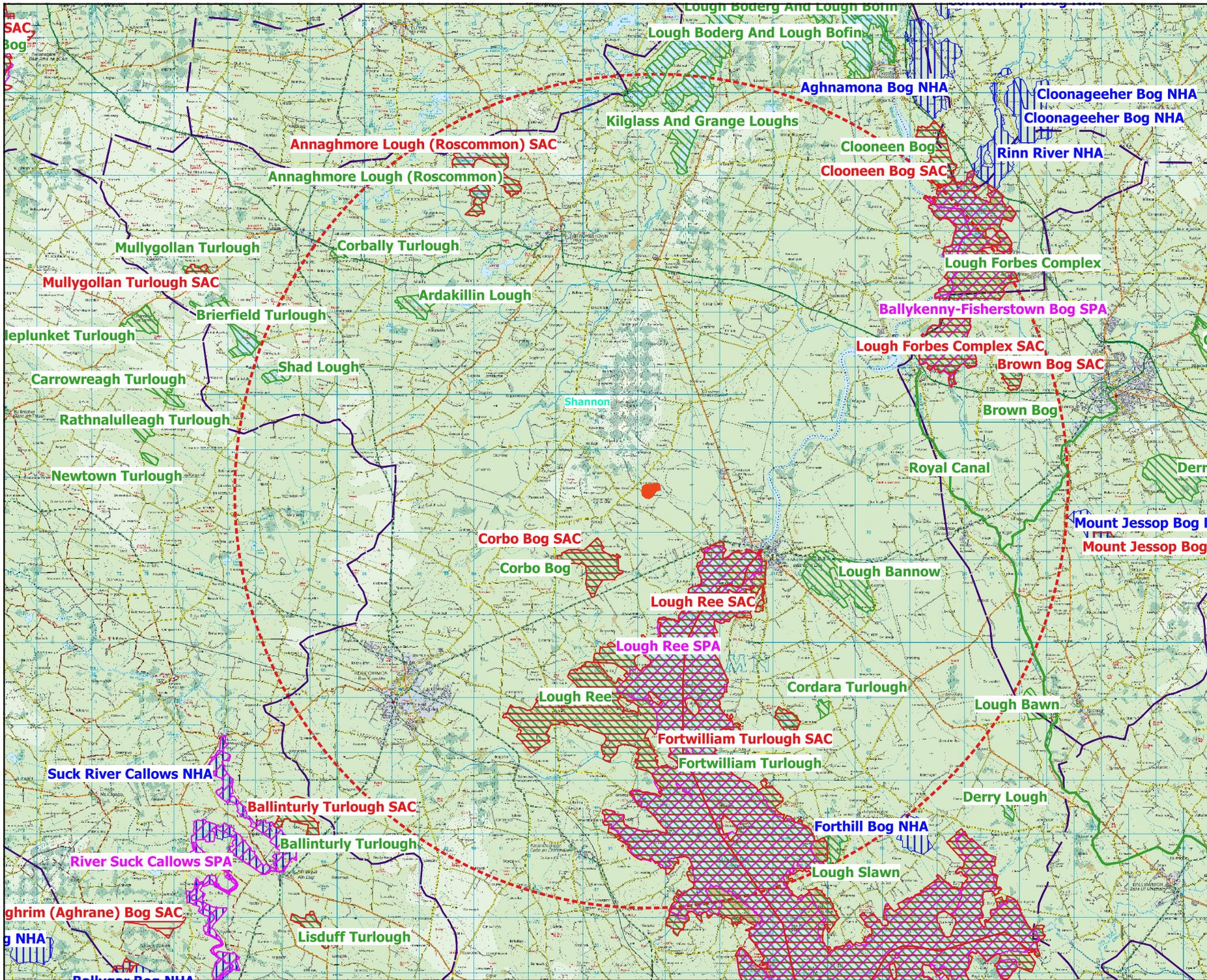
The proposed replanting land at Sheehaun, Co. Roscommon has been assessed as part of the Afforestation Approval - Form 1 process described above and has obtained Technical Approval for Afforestation from the Forest Service. The site location is presented in Figure 2-%

### 5.4.1 Desk Study

The following sections detail the results of the searches of published material that were consulted as part of the desk study for the Sheehaun site.

### 5.4.2 Identification of the Designated Sites Likely Zone of Influence of the Project

Using the Geographic Information System (GIS) software MapInfo (Version 10.0), designated sites within a 15-kilometre radius of the proposed afforestation site were identified. The European designated sites are listed below in Table 5-2 and all Nationally designated sites are listed in Table 5-3. In addition, the potential for connectivity with European Sites at distances of greater than 15km from the proposed alteration was also considered in this initial assessment. In this case, connectivity with European sites outside the 15km zone was identified and the relevant sites are included in Table 5-2 below. All designated sites are displayed in Figure 5-1.



### Map Legend

- Special Area of Conservation
- Special Protection Area
- Natural Heritage Areas
- Proposed Natural Heritage Area
- Site Location
- 15km Buffer
- Hydrological Sub - Catchments
- Hydrological Catchments

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Drawing Title	
All Designated Sites within 15km - Sheehaun, Co. Cork.	
Project Title	
Curraglass Renewable Energy Development, Co. Cork	
Drawn By	Checked By
CS	JOS
Project No.	Drawing No.
190301	Figure 5-1
Scale	Date
1:180000	10-06-2020

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Table 5-2 Identification of Designated sites within the Likely Zone of Impact

European Sites and distance from proposed development	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 05/03/2020	Conservation Objectives	Likely Zone of Impact Determination
<b>Special Areas of Conservation (SAC)</b>			
Corbo Bog SAC [002349]  <b>Distance:</b> 2.4km	<ul style="list-style-type: none"> <li>➤ [7110] Active raised bogs*</li> <li>➤ [7120] Degraded raised bogs still capable of natural regeneration</li> <li>➤ [7150] Depressions on peat substrates of the <i>Rhynchosporion</i></li> </ul>	Detailed conservation objectives for this site (Version 1, November 2015) were reviewed as part of the assessment and are available at www.npws.ie	<p>There will be no direct effects as the project footprint is located entirely outside the designated site.</p> <p>Corbo Bog SAC is located approximately 2.4km south-west of the proposed afforestation site and is buffered by agricultural habitats. No hydrological connectivity exists between the proposed development site and this designated site. Impacts on the listed QI habitats can be ruled out due to terrestrial nature of the habitats, the distance from the proposed works area and the absence of a complete source-pathway-receptor chain for impact.</p> <p><b>No pathway for significant effect was identified and the site is not within the Likely Zone of Impact.</b></p>
Lough Ree SAC [000440]  <b>Distance:</b> 2.7km  (7.4km hydrological distance)	<ul style="list-style-type: none"> <li>➤ [3150] Natural eutrophic lakes with <i>Magnopotamion</i> or <i>Hydrocharition</i> - type vegetation</li> <li>➤ [6210] Semi-natural dry grasslands and scrubland facies on calcareous substrates</li> </ul>	Detailed conservation objectives for this site (Version 1, August 2016) were reviewed as part of the assessment and are available at www.npws.ie	<p>There will be no direct effects as the project footprint is located entirely outside of the designated site.</p> <p>The proposed afforestation site has surface water connectivity in excess of 7.4km</p>

European Sites and distance from proposed development	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 05/03/2020	Conservation Objectives	Likely Zone of Impact Determination
	<p>(<i>Festuco-Brometalia</i>) (* important orchid sites)</p> <ul style="list-style-type: none"> <li>&gt; [7110] Active raised bogs*</li> <li>&gt; [7120] Degraded raised bogs still capable of natural regeneration</li> <li>&gt; [7230] Alkaline fens</li> <li>&gt; [8240] Limestone pavements*</li> <li>&gt; [91A0] Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles</li> <li>&gt; [91D0] Bog woodland*</li> <li>&gt; [1355] Otter (<i>Lutra lutra</i>)</li> </ul>		<p>downstream with Lough Ree SAC via Gortgallan Stream which discharges into the River Shannon approximately 5.8km downstream of the proposed replanting site and then into this European site. However, given distance downstream and nature and small scale of the works (replanting only) as permitted in the technical approval document there is no potential for indirect effects on this SAC.</p> <p><b>No pathway for significant effect was identified and the site is not within the Likely Zone of Impact.</b></p>
<p>Fortwilliam Turlough SAC [000448]</p> <p><b>Distance:</b> 9.0km</p>	<ul style="list-style-type: none"> <li>&gt; [3180] Turloughs*</li> </ul>	<p>Detailed conservation objectives for this site (Version 1, February 2018) were reviewed as part of the assessment and are available at www.npws.ie</p>	<p>There will be no direct effects as the project footprint is located entirely outside the designated site.</p> <p>Fortwilliam Turlough SAC is located approximately 9km south-east of the proposed afforestation site and is buffered by agricultural, forestry, bog, scrub habitats and Lough Ree. No hydrological connectivity exists between the proposed development and the designated site.</p> <p><b>No pathway for significant effect was identified and the site is not within the Likely Zone of Impact.</b></p>

European Sites and distance from proposed development	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 05/03/2020	Conservation Objectives	Likely Zone of Impact Determination
<p>Lough Forbes Complex SAC [001818]</p> <p><b>Distance:</b> 10.6km</p>	<ul style="list-style-type: none"> <li>➤ [3150] Natural eutrophic lakes with <i>Magnopotamion</i> or <i>Hydrocharition</i> - type vegetation</li> <li>➤ [7110] Active raised bogs*</li> <li>➤ [7120] Degraded raised bogs still capable of natural regeneration</li> <li>➤ [7150] Depressions on peat substrates of the <i>Rhynchosporion</i></li> <li>➤ [[91E0] Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnion incanae</i>, <i>Salicion albae</i>)*</li> </ul>	<p>Detailed conservation objectives for this site (Version 1, May 2019) were reviewed as part of the assessment and are available at www.npws.ie</p>	<p>There will be no direct effects as the project footprint is located entirely outside the designated site.</p> <p>Lough Forbes Complex SAC is located approximately 10.6km north-east of the proposed afforestation site and are buffered by a variety of habitats. Although the sites are located within the same hydrological catchment, no hydrological connectivity exists between the proposed development and the European designated site. Impacts on all of the listed QI habitats can be ruled out due to terrestrial nature of the habitats, the distance from the proposed works area and the absence of a complete source-pathway-receptor chain for impact.</p> <p><b>No pathway for significant effect was identified and the site is not within the Likely Zone of Impact.</b></p>
<p>Annaghmore Lough (Roscommon) SAC [001626]</p> <p><b>Distance:</b> 11.6km</p>	<ul style="list-style-type: none"> <li>➤ [7230] Alkaline fens</li> <li>➤ [1013] Geyer's Whorl Snail (<i>Vertigo geyeri</i>)</li> </ul>	<p>Detailed conservation objectives for this site (Version 1, January 2019) were reviewed as part of the assessment and are available at www.npws.ie</p>	<p>There will be no direct effects as the project footprint is located entirely outside the designated site.</p> <p>Annaghmore Lough (Roscommon) SAC is located approximately 11.6km north-west of the proposed afforestation site and is buffered</p>

European Sites and distance from proposed development	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 05/03/2020	Conservation Objectives	Likely Zone of Impact Determination
			<p>by various habitats including peatlands, forestry and agricultural habitats. Although the sites are located within the same hydrological catchment, no hydrological connectivity exists between the proposed development and the nationally designated site. Impacts on the listed QI habitats/species can be ruled out due to terrestrial nature of the habitats/species, the distance from the proposed works area and the absence of a complete source-pathway-receptor chain for impact.</p> <p><b>No pathway for significant effect was identified and the site is not within the Likely Zone of Impact.</b></p>
<p>Brown Bog SAC [002346]  <b>Distance:</b> 13.1km</p>	<ul style="list-style-type: none"> <li>➤ [7110] Active raised bogs*</li> <li>➤ [7120] Degraded raised bogs still capable of natural regeneration</li> <li>➤ [7150] Depressions on peat substrates of the <i>Rhynchosporion</i></li> </ul>	<p>Detailed conservation objectives for this site (Version 1, February 2016) were reviewed as part of the assessment and are available at www.npws.ie</p>	<p>There will be no direct effects as the project footprint is located entirely outside the designated site.</p> <p>This SAC is located in a separate hydrological sub-catchment to the proposed afforestation works and there is no connectivity between the afforestation site and the SAC. Impacts on all of the listed QI habitats can be ruled out due to terrestrial nature of the habitats, the distance from the proposed works area and the absence of a complete source-pathway-receptor chain for impact.</p>

European Sites and distance from proposed development	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 05/03/2020	Conservation Objectives	Likely Zone of Impact Determination
			<b>No pathway for effect was identified and the site is not within the Likely Zone of Impact.</b>
Clooneen Bog SAC [002348]  <b>Distance:</b> 14.9km	<ul style="list-style-type: none"> <li>➤ [7110] Active raised bogs*</li> <li>➤ [7120] Degraded raised bogs still capable of natural regeneration</li> <li>➤ [7150] Depressions on peat substrates of the <i>Rhynchosporion</i></li> <li>➤ [91D0] Bog woodland*</li> </ul>	Detailed conservation objectives for this site (Version 1, August 2016) were reviewed as part of the assessment and are available at www.npws.ie	There will be no direct effects as the project footprint is located entirely outside the designated site.  Clooneen Bog SAC is located approximately 14.9km north-east of the proposed afforestation site and is buffered by various habitats including peatlands, forestry and agricultural habitats. No hydrological connectivity exists between the proposed development and the nationally designated site. Impacts on all of the listed QI habitats can be ruled out due to terrestrial nature of the habitats, the distance from the proposed works area and the absence of a complete source-pathway-receptor chain for impact.  <b>No pathway for significant effect was identified and the site is not within the Likely Zone of Impact.</b>
River Shannon Callows SAC [000216]  <b>Distance:</b> 31.2km	<ul style="list-style-type: none"> <li>➤ Molinia meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinion caeruleae</i>) [6410]</li> <li>➤ Lowland hay meadows (<i>Alopecurus pratensis</i>, <i>Sanguisorba officinalis</i>) [6510]</li> </ul>	This site has the generic conservation objective:  <i>‘To maintain or restore the favourable conservation condition of the Annex I</i>	There will be no direct effects as the project footprint is located entirely outside of the designated site.  The proposed afforestation site has surface

European Sites and distance from proposed development	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 05/03/2020	Conservation Objectives	Likely Zone of Impact Determination
	<ul style="list-style-type: none"> <li>&gt; Limestone pavements [8240]</li> <li>&gt; Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnion incanae</i>, <i>Salicion albae</i>) [91E0]</li> <li>&gt; <i>Lutra lutra</i> (Otter) [1355]</li> </ul>	<p><i>habitat(s) and/or the Annex II species for which the SAC has been selected'</i></p> <p>(NPWS Generic version 6.0, 2018)</p>	<p>water connectivity in excess of 41.5km downstream with River Shannon Callows SAC via Gortgallan Stream which discharges into the River Shannon approximately 5.8km downstream of the proposed replanting site, through Lough Ree and then into this European site. However, given distance downstream and nature and small scale of the works (replanting only) as permitted in the technical approval document there is no potential for indirect effects on this SAC.</p> <p><b>No pathway for significant effect was identified and the site is not within the Likely Zone of Impact.</b></p>
<b>Special Protection Area (SPA)</b>			
<p>Lough Ree SPA [004064]</p> <p><b>Distance:</b> 4.2km</p> <p>(7.4km hydrological distance)</p>	<ul style="list-style-type: none"> <li>&gt; [A038] Whooper Swan (<i>Cygnus cygnus</i>)</li> <li>&gt; [A056] Shoveler (<i>Anas clypeata</i>)</li> <li>&gt; [A067] Goldeneye (<i>Bucephala clangula</i>)</li> <li>&gt; [A050] Wigeon (<i>Anas penelope</i>)</li> <li>&gt; [A142] Lapwing (<i>Vanellus vanellus</i>)</li> <li>&gt; [A193] Common Tern (<i>Sterna hirundo</i>)</li> <li>&gt; [A065] Common Scoter (<i>Melanitta nigra</i>)</li> <li>&gt; [A125] Coot (<i>Fulica atra</i>)</li> <li>&gt; [A052] Teal (<i>Anas crecca</i>)</li> <li>&gt; [A004] Little Grebe (<i>Tachybaptus ruficollis</i>)</li> </ul>	<p>This site has the generic conservation objective:</p> <p><i>'To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests of this SPA'</i></p> <p>This site has a second conservation objective:</p>	<p>There will be no direct effects as the project footprint is located entirely outside the designated site.</p> <p>The proposed afforestation site has surface water connectivity in excess of 7.4km downstream with Lough Ree SPA via Gortgallan Stream. No supporting habitat for SCI species was identified within the proposed afforestation site. Given the distance downstream, nature and small scale of the works (replanting only) as permitted in the</p>

European Sites and distance from proposed development	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 05/03/2020)	Conservation Objectives	Likely Zone of Impact Determination
	<ul style="list-style-type: none"> <li>&gt; [A053] Mallard (<i>Anas platyrhynchos</i>)</li> <li>&gt; [A061] Tufted Duck (<i>Aythya fuligula</i>)</li> <li>&gt; [A140] Golden Plover (<i>Pluvialis apricaria</i>)</li> <li>&gt; Wetland and Waterbirds [A999]</li> </ul>	<p><i>‘To maintain or restore the favourable conservation condition of the wetland habitat at Lough Ree SPA as a resource for the regularly-occurring migratory waterbirds that utilise it.’</i></p> <p>(NPWS Generic version 6.0, 2018)</p>	<p>technical approval document and the lack of supporting habitat there is no potential for indirect effects on the SPA.</p> <p><b>No pathway for significant effect was identified and the site is not within the Likely Zone of Impact.</b></p>
<p>Ballykenny-Fisherstown Bog SPA [001401]</p> <p><b>Distance:</b> 10.6km</p>	<ul style="list-style-type: none"> <li>&gt; [A395] Greenland White-fronted Goose (<i>Anser albifrons flavirostris</i>)</li> </ul>	<p>This site has the generic conservation objective:</p> <p><i>‘To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests of this SPA.’</i></p> <p>(NPWS Generic version 6.0, 2018)</p>	<p>There will be no direct effects as the project footprint is located entirely outside the designated site.</p> <p>Ballykenny-Fisherstown Bog SPA is located approximately 10.6km north-west of the proposed afforestation site and is buffered by agricultural, forestry and peatland habitats.</p> <p>The proposed afforestation site lies outside the core foraging range of SCI species Greenland White-fronted Goose (5-8km as per SNH Version 3, 2016) for which the European site is designated.</p> <p><b>No pathway for indirect effect was identified and the site is not within the Likely Zone of Impact.</b></p>

European Sites and distance from proposed development	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 05/03/2020	Conservation Objectives	Likely Zone of Impact Determination
<p>Middle Shannon Callows SPA [004096]</p> <p><b>Distance:</b> 31.2km</p>	<ul style="list-style-type: none"> <li>➤ Whooper Swan (<i>Cygnus cygnus</i>) [A038]</li> <li>➤ Wigeon (<i>Anas penelope</i>) [A050]</li> <li>➤ Corncrake (<i>Crex crex</i>) [A122]</li> <li>➤ Golden Plover (<i>Pluvialis apricaria</i>) [A140]</li> <li>➤ Lapwing (<i>Vanellus vanellus</i>) [A142]</li> <li>➤ Black-tailed Godwit (<i>Limosa limosa</i>) [A156]</li> <li>➤ Black-headed Gull (<i>Chroicocephalus ridibundus</i>) [A179]</li> <li>➤ Wetland and Waterbirds [A999]</li> </ul>	<p>This site has the generic conservation objective:</p> <p><i>‘To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests of this SPA.’</i></p> <p>This site has a second conservation objective:</p> <p><i>‘To maintain or restore the favourable conservation condition of the wetland habitat at Middle Shannon Callows SPA as a resource for the regularly-occurring migratory waterbirds that utilise it.’</i></p> <p>(NPWS Generic version 6.0, 2018)</p>	<p>There will be no direct effects as the project footprint is located entirely outside the designated site.</p> <p>The proposed afforestation site has surface water connectivity in excess of 41.5km downstream with Middle Shannon Callows SPA via Gortgallan Stream. No supporting habitat for SCI species was identified within the proposed afforestation site. Given the long distance downstream, nature and small scale of the works (replanting only) as permitted in the technical approval document and the lack of supporting habitat there is no potential for indirect effects on the SPA.</p> <p><b>No pathway for significant effect was identified and the site is not within the Likely Zone of Impact.</b></p>

Table 5-3 Identification of nationally Designated sites within the Likely Zone of Impact

Designated Sites and distance from proposed development	Features of Interest	Likely Zone of Impact Determination
<b>Natural Heritage Area (NHA)</b>		
Lisnanarriagh Bog NHA [002072]  <b>Distance:</b> 3.7km	> Peatlands [4]	<p>There will be no direct effects as the project footprint is located entirely outside the designated site.</p> <p>Lisnanarriagh Bog NHA is located approximately 3.7km south of the proposed afforestation site and is buffered by agricultural, peatland and scrub habitats. No hydrological connectivity exists between the proposed development and the designated site. this NHA is designated for terrestrial habitats. No pathway for indirect effect between the proposal and the designated site exists.</p> <p><b>No pathway for effect was identified and the site is not within the Likely Zone of Impact.</b></p>
Derrycanan Bog NHA [000605]  <b>Distance:</b> 4.5km	> Peatlands [4]	<p>There will be no direct effects as the project footprint is located entirely outside the designated site.</p> <p>Derrycanan Bog NHA is located approximately 4.5km west of the proposed afforestation site and is buffered by agricultural, forestry and scrub habitats. Although the sites are located within the same hydrological catchment, no hydrological connectivity exists between the proposed development. This designated site is designated for terrestrial habitats. No pathway for indirect effect between the proposal and the designated site exists.</p>

Designated Sites and distance from proposed development	Features of Interest	Likely Zone of Impact Determination
		<p><b>No pathway for effect was identified and the site is not within the Likely Zone of Impact.</b></p>
<p>Forthill Bog NHA [001448]</p> <p><b>Distance:</b> 14.9km</p>	<p>➤ Peatlands [4]</p>	<p>There will be no direct effects as the project footprint is located entirely outside the designated site.</p> <p>Forthill Bog NHA is located approximately 14.9km south-east of the proposed afforestation site and are buffered by agricultural, forestry, bog and scrub habitats and Lough Ree. Although the sites are located within the same hydrological catchment, no hydrological connectivity exists between the proposed development. This designated site is designated for terrestrial habitats. No pathway for indirect effect between the proposal and the designated site exists.</p> <p><b>No pathway for effect was identified and the site is not within the Likely Zone of Impact.</b></p>
<p><b>Proposed Natural Heritage Area (pNHA)</b></p>		
<p>Corbo Bog [000602]</p> <p><b>Distance:</b>2.4km</p>	<p>➤ N/A</p>	<p>There will be no direct effects as the project footprint is located entirely outside the designated site.</p> <p>Corbo Bog pNHA is located approximately 2.4km south-west of the proposed afforestation site and is buffered by agricultural habitats. Although the sites are located within the same hydrological catchment, no hydrological connectivity exists between the proposed development and the nationally designated site.</p>

Designated Sites and distance from proposed development	Features of Interest	Likely Zone of Impact Determination
		<p>Therefore, no pathway for indirect effect between the proposal and the designated site exists.</p> <p><b>No pathway for significant effect was identified and the site is not within the Likely Zone of Impact.</b></p>
<p>Lough Ree [000440]</p> <p><b>Distance:</b> 2.7km</p>	<p>&gt; N/A</p>	<p>There will be no direct effects as the project footprint is located entirely outside the designated site.</p> <p>The proposed afforestation site has surface water connectivity in excess of 7.4km downstream with Lough Ree pNHA. However, given distance downstream and nature and small scale of the works (replanting only) as permitted in the technical approval document there is no potential for indirect effects on the nationally designated site. Therefore, no pathway for indirect effect between the proposal and the designated site exists.</p> <p><b>No pathway for significant effect was identified and the site is not within the Likely Zone of Impact.</b></p>
<p>Lough Bannow [000449]</p> <p><b>Distance:</b>6.0km</p>	<p>&gt; N/A</p>	<p>There will be no direct effects as the project footprint is located entirely outside the designated site.</p> <p>Lough Bannow is located approximately 6km south-east of the proposed afforestation site and are buffered by agricultural, forestry, bog and scrub habitats. Although the sites are located within the same hydrological catchment, no hydrological connectivity exists between the proposed development and the nationally designated site. Therefore, no pathway for indirect</p>

Designated Sites and distance from proposed development	Features of Interest	Likely Zone of Impact Determination
		<p>effect between the proposal and the designated site exists.</p> <p><b>No pathway for significant effect was identified and the site is not within the Likely Zone of Impact.</b></p>
<p>Fortwilliam Turlough [000448]</p> <p><b>Distance:</b> 9.0km</p>	<p>➤ N/A</p>	<p>There will be no direct effects as the project footprint is located entirely outside the designated site.</p> <p>Fortwilliam Turlough pNHA is located approximately 9km south-east of the proposed afforestation site and are buffered by agricultural, forestry, bog, scrub habitats and Lough Ree. Although the sites are located within the same hydrological catchment, no hydrological connectivity exists between the proposed afforestation development and the nationally designated site.</p> <p><b>No pathway for significant effect was identified and the site is not within the Likely Zone of Impact.</b></p>
<p>Cordara Turlough [001821]</p> <p><b>Distance:</b> 9.7km</p>	<p>➤ N/A</p>	<p>There will be no direct effects as the project footprint is located entirely outside the designated site.</p> <p>Cordara Turlough pNHA is located approximately 9.7km south-east of the proposed afforestation site and are buffered by Lough Ree, agricultural, forestry, bog and scrub habitats. Although the sites are located within the same hydrological catchment, no hydrological connectivity exists between the proposed afforestation site and the designated site. Therefore, no pathway for indirect effect between the proposal and the designated site exists.</p>

Designated Sites and distance from proposed development	Features of Interest	Likely Zone of Impact Determination
Royal Canal [002103]  <b>Distance:</b> 9.8km	> N/A	<p><b>No pathway for significant effect was identified and the site is not within the Likely Zone of Impact.</b></p> <p>There will be no direct effects as the project footprint is located entirely outside the designated site.</p> <p>There is no hydrological connectivity between the proposed afforestation site and this nationally designated site, located predominantly in a separate hydrological sub-catchment. Therefore, no pathway for indirect effect between the proposal and the designated site exists.</p> <p><b>No pathway for effect was identified and the site is not within the Likely Zone of Impact.</b></p>
Ardakillin Lough [001617]  <b>Distance:</b> 10.1km	> N/A	<p>There will be no direct effects as the project footprint is located entirely outside the designated site.</p> <p>Ardakillin Lough pNHA is located approximately 10.1km north-west of the proposed afforestation site and are buffered by agricultural, forestry, bog and scrub habitats. Although the sites are located within the same hydrological catchment, no hydrological connectivity exists between the proposed afforestation site and the designated site. Therefore, no pathway for indirect effect between the proposal and the designated site exists.</p> <p><b>No pathway for significant effect was identified and the site is not within the Likely Zone of Impact.</b></p>

Designated Sites and distance from proposed development	Features of Interest	Likely Zone of Impact Determination
<p>Lough Forbes Complex [001818]</p> <p><b>Distance:</b>10.6km</p>	<p>➤ N/A</p>	<p>There will be no direct effects as the project footprint is located entirely outside the designated site.</p> <p>Lough Forbes Complex is located approximately 10.6km north-east of the proposed afforestation site and are buffered by various habitats. Although the sites are located within the same hydrological catchment, no hydrological connectivity exists between the proposed development and the nationally designated site. Therefore, no pathway for indirect effect between the proposal and the designated site exists.</p> <p><b>No pathway for significant effect was identified and the site is not within the Likely Zone of Impact.</b></p>
<p>Kilglass And Grange Loughs [000608]</p> <p><b>Distance:</b>11.4km</p>	<p>➤ N/A</p>	<p>There will be no direct effects as the project footprint is located entirely outside the designated site.</p> <p>Kilglass And Grange Loughs pNHA is located approximately 11.4km north of the proposed afforestation site and are buffered by various habitats including peatlands, forestry and agricultural habitats. Although the sites are located within the same hydrological catchment, no hydrological connectivity exists between the proposed development and the nationally designated site. Therefore, no pathway for indirect effect between the proposal and the designated site exists.</p> <p><b>No pathway for significant effect was identified and the site is not within the Likely Zone of Impact.</b></p>

Designated Sites and distance from proposed development	Features of Interest	Likely Zone of Impact Determination
Annaghmore Lough (Roscommon) [001626]  <b>Distance:</b> 11.6km	> N/A	<p>There will be no direct effects as the project footprint is located entirely outside the designated site.</p> <p>Annaghmore Lough (Roscommon) pNHA is located approximately 11.6km north-west of the proposed afforestation site and are buffered by various habitats including peatlands, forestry and agricultural habitats. Although the sites are located within the same hydrological catchment, no hydrological connectivity exists between the proposed development and the nationally designated site. Therefore, no pathway for indirect effect between the proposal and the nationally designated site exists.</p> <p><b>No pathway for significant effect was identified and the site is not within the Likely Zone of Impact.</b></p>
Brown Bog [000442]  <b>Distance:</b> 13.1km	> N/A	<p>There will be no direct effects as the project footprint is located entirely outside the designated site.</p> <p>There is no hydrological connectivity between the proposed afforestation site and this nationally designated site, located in a separate hydrological sub-catchment. Therefore, no pathway for indirect effect between the proposal and the designated site exists.</p> <p><b>No pathway for effect was identified and the site is not within the Likely Zone of Impact.</b></p>
Shad Lough [001648]	> N/A	<p>There will be no direct effects as the project footprint is located entirely outside the designated site.</p>

Designated Sites and distance from proposed development	Features of Interest	Likely Zone of Impact Determination
<p><b>Distance:</b>13.6km</p>		<p>Shad Lough pNHA is located approximately 13.6km north-west of the proposed afforestation site and is buffered by various habitats including peatlands, forestry and agricultural habitats. Although the sites are located within the same hydrological catchment, no hydrological connectivity exists between the proposed development and the nationally designated site. Therefore, no pathway for indirect effect between the proposal and the nationally designated site exists.</p> <p><b>No pathway for significant effect was identified and the site is not within the Likely Zone of Impact.</b></p>
<p>Lough Slawn [001443]</p> <p><b>Distance:</b>13.7km</p>	<p>➤ N/A</p>	<p>There will be no direct effects as the project footprint is located entirely outside the designated site.</p> <p>Lough Slawn pNHA is located off the south-eastern border of Lough Ree in the same hydrological catchment as the proposed afforestation site. However, given distance downstream, nature and small scale of the works (replanting only) as permitted in the technical approval document there is no potential for indirect effects on the nationally designated site.</p> <p><b>No pathway for significant effect was identified and the site is not within the Likely Zone of Impact.</b></p>
<p>Corbally Turlough [001627]</p> <p><b>Distance:</b>13.9km</p>	<p>➤ N/A</p>	<p>There will be no direct effects as the project footprint is located entirely outside the designated site.</p>

Designated Sites and distance from proposed development	Features of Interest	Likely Zone of Impact Determination
		<p>Corbally Turlough pNHA is located approximately 13.9km north-west of the proposed afforestation site and is buffered by various habitats including peatlands, forestry and agricultural habitats. Although the sites are located within the same hydrological catchment, no hydrological connectivity exists between the proposed development and the nationally designated site. Therefore, no pathway for indirect effect between the afforestation site and the nationally designated site exists.</p> <p><b>No pathway for significant effect was identified and the site is not within the Likely Zone of Impact.</b></p>
<p>Clooneen Bog [000445]</p> <p><b>Distance:</b>14.9km</p>	<p>➤ N/A</p>	<p>There will be no direct effects as the project footprint is located entirely outside the designated site.</p> <p>Clooneen Bog pNHA is located approximately 14.9km north-east of the proposed afforestation site and is buffered by various habitats including peatlands, forestry and agricultural habitats. Although the sites are located within the same hydrological catchment, no hydrological connectivity exists between the proposed development and the nationally designated site. Therefore, no pathway for indirect effect between the afforestation site and the nationally designated site exists.</p> <p><b>No pathway for significant effect was identified and the site is not within the Likely Zone of Impact.</b></p>

### 5.4.3 New Flora Atlas

A search was made in the *New Atlas of the British & Irish Flora* (Preston et al, 2002) to investigate whether any rare or unusual plant species listed under Annex II of the EU Habitats Directive, *Ireland Red List no 10 Vascular Plants* (Wyse et.al 2016) or the Flora (Protection) Order, 2015 had been recorded in the relevant 10km square in which the study site is situated (M97), during the 1987-1999 atlas survey. No species protected under the Flora (Protection) Order, 1999 (as amended 2015) have been previously recorded within the hectad.

Rough chervil (*Chaerophyllum temulum*) and Irish whitebeam (*Sorbus hibernica*) listed on the Irish Red List (Vulnerable) have been previously recorded within the hectad. Fragrant Agrimony (*Agrimonia procera*), corn marigold (*Chrysanthemum segetum*), vervain (*Verbena officinalis*) and frog orchid (*Coeloglossum viride*) listed on the Irish Red List (Near threatened) have also been previously recorded within the hectad.

### 5.4.4 National Biodiversity Data Centre Notable Records

A search of the National Biodiversity Data Centre (NBDC) website was conducted with a focus on records of protected fauna recorded from hectad M97. The results of the database search (excluding birds) are provided below in Table 5-4 and the results for bird species recorded within the hectad are provided in Table 5-5. Table 5-6 includes records of non-native invasive species listed under the Third Schedule of the European Communities Regulations 2011 (S.I. 477 of 2015).

Table 5-4 Notable species that occur within 10km Grid Square M97 [excluding birds]

Common Name	Scientific Name	Designation
Common frog	<i>Rana temporaria</i>	HD Annex V, WA
Daubenton's bat	<i>Myotis daubentonii</i>	HD Annex IV, WA
Eurasian badger	<i>Meles meles</i>	WA
Eurasian pygmy shrew	<i>Sorex minutus</i>	WA
Eurasian red squirrel	<i>Sciurus vulgaris</i>	WA
European otter	<i>Lutra lutra</i>	HD Annex II & IV, WA
Lesser noctule	<i>Nyctalus leisleri</i>	HD Annex IV, WA
Pine marten	<i>Martes martes</i>	HD Annex V, WA
Pipistrelle	<i>Pipistrellus pipistrellus sensu lato</i>	HD Annex IV, WA
Soprano pipistrelle	<i>Pipistrellus pygmaeus</i>	HD Annex IV, WA

WA = Wildlife Acts (1976-2019), HD Annex II, III, IV and V = EU Habitats Directive.

Table 5-5 Notable bird species that occur within 10km Grid Square M97

Common Name	Scientific Name	Designation
Black-headed gull	<i>Larus ridibundus</i>	BoCCI Red List [Breeding], WA
Common kingfisher	<i>Alcedo atthis</i>	BD Annex I, WA

Common pochard	<i>Aythya ferina</i>	BoCCI Red List [Wintering], WA
Common redshank	<i>Tringa totanus</i>	BoCCI Red List [Breeding & Wintering], WA
Corn crake	<i>Crex crex</i>	BD Annex I, BoCCI Red List [Breeding], WA
Dunlin	<i>Calidris alpina</i>	BD Annex I, WA
Eurasian curlew	<i>Numenius arquata</i>	BoCCI Red List [Breeding & Wintering], WA
Eurasian wigeon	<i>Anas penelope</i>	BoCCI Red List [Wintering], WA
Eurasian woodcock	<i>Scolopax rusticola</i>	BoCCI Red List [Breeding], WA
European Golden Plover	<i>Pluvialis apricaria</i>	B BD Annex I, CCI Red List [Breeding & Wintering], WA
Grey partridge	<i>Perdix perdix</i>	BoCCI Red List [Breeding], WA
Grey wagtail	<i>Motacilla cinerea</i>	BoCCI Red List WA
Hen harrier	<i>Circus cyaneus</i>	BD Annex I, WA
Herring gull	<i>Larus argentatus</i>	BoCCI Red List [Breeding], WA
Meadow pipit	<i>Anthus pratensis</i>	BoCCI Red List [Breeding], WA
Northern lapwing	<i>Vanellus vanellus</i>	BoCCI Red List [Breeding & Wintering], WA
Northern pintail	<i>Anas acuta</i>	BoCCI Red List [Wintering], WA
Northern Shoveler	<i>Anas clypeata</i>	BoCCI Red List [Wintering], WA
Peregrine falcon	<i>Falco peregrinus</i>	BD Annex I, WA
Whooper swan	<i>Cygnus Cygnus</i>	Annex I, WA
Yellowhammer	<i>Emberiza citrinella</i>	BoCCI Red List [Breeding], WA

WA = Wildlife Acts (1976-2019), BoCCI Red List = Birds of Conservation Concern Red List; BD Annex I = EU Birds Directive Annex I.

Table 5-6 NBDC records for invasive species in hectad M97

Common Name	Scientific Name
American mink	<i>Mustela vison</i>
Canadian waterweed	<i>Elodea canadensis</i>
Fallow deer	<i>Dama dama</i>

#### 5.4.5 Water Quality

The proposed afforestation site is located within the Upper Shannon Catchment [26C]. The Gortgallan Stream runs along the northern border the site flowing in an easterly direction, discharging into the River Shannon approximately 5.8km downstream of the proposed replanting site.

There is no EPA water quality monitoring station downstream from the Gortgallan Stream to provide a River Water Quality assessment score (Q-value). The closest Q value monitoring station is located within the River Shannon, one 0.5km upstream of Lanesborough Bridge and at Lanesborough bridge. The most recent QValue Score for each of these sites was 3 – Poor Status. The Water Framework Directive (WFD) river waterbody risk score for the Gortgallan Stream was ‘unassigned’ any status. The WFD Ground Waterbody status 2013 – 2018 in the Curraghroe area in which the site lies is classified as ‘Good’.

#### 5.4.6 Freshwater Pearl Mussel Sensitive Areas

The site is not located within a Pearl Mussel (*Margaritifera margaritifera*) sensitive area. The site has no connectivity to any pearl mussel sensitive areas.

#### 5.4.7 Conclusions of the Desktop Study

The afforestation site is not located within any site designated for nature conservation. The proposed afforestation site has surface water connectivity (in excess of 7.4km downstream) with Lough Ree SAC and Lough Ree SPA. River Shannon Callows SAC [000216] and Middle Shannon Callows SPA [004096] are located over 41.5km hydrological distance downstream of the proposed replanting site. However, given distance downstream, nature and small scale of the works (replanting only) as permitted in the technical approval document there is no potential for indirect effects on the designated sites. The mammal species recorded within the relevant hectad have widespread range and distributions and are likely to be recorded frequently throughout Ireland. A number of rare and protected flora and fauna have been recorded from the hectad in which the proposed development is located.

#### 5.4.8 Habitats Present

The site is largely dominated by an **improved agricultural grassland (GAI)**, grazed by sheep on the day of the site visit, and **wet grassland (GS4)** mosaic habitats. Field boundaries are demarcated by **hedgerows (WL1)**, **treelines (WL2)** and **drainage ditches (FW4)**. Some of the field boundaries are marked with fencing categorised as **buildings and artificial surfaces (BL3)**. Heavily poached areas throughout the site were categorised as **spoil and bare ground (ED2)** (Plate 5-1).

The grassland habitat is extensively dominated by rye-grass species (*Lolium spp.*) and rushes (*Juncus spp.*). Other grassland species recorded include cock’s-foot (*Dactylus glomerata*), creeping buttercup (*Ranunculus repens*), white clover (*Trifolium repens*), spear thistle (*Cirsium vulgare*), primrose (*Primula vulgaris*), hard fern (*Blechnum spicant*), lesser celandine (*Ficaria verna*), mouse-ear (*Cerastium fontanum*) and sorrel (*Rumex acetosa*).

The **hedgerows (WL1)** and **treelines (WL2)** are dominated by hawthorn (*Crataegus monogyna*), ash (*Fraxinus excelsior*), gorse (*Ulex europaeus*), cleavers (*Galium aparine*), holly (*Ilex aquifolium*), bramble

(*Rubus fruticosus* agg.) and some willow (*Salix* spp.). Areas of gorse (*Ulex europaeus*) and bramble (*Rubus fruticosus* agg.) **scrub (WS1)** are present throughout the site.

A number of the **drainage ditches (FW4)** within the field boundaries recorded throughout the site contained standing water and had become filled with vegetation (Plate 5-2).

The Gortgallan Stream flows in an easterly direction along the northern boundary of the site and is classified as a **depositing/lowland river (FW2)**. A **drainage ditch (FW4)** was also recorded along the north-eastern boundary of the site and meets the Gortgallan Stream at the most northerly point of the proposed afforestation site (Plate 5-3).



Plate 5-1 The site was dominated by an improved agricultural grassland (GAI)/wet grassland (GS4) mosaic with field boundaries demarcated by hedgerows (WL1)/treelines (WL2). Heavily poached areas were categorised as spoil and bare ground (ED2).



*Plate 5-2 A number of the field boundaries were demarcated by drainage ditches (FW4). Some recorded throughout the site contained standing water and had become filled with vegetation.*



*Plate 5-3 Gortgallan Stream flowing along the northern boundary of the site and is classified as an depositing/lowland river (FW2). A drainage ditch (FW4) was also recorded along the north-eastern boundary of the site along the and meets the Gortgallan Stream.*

#### 5.4.9 Invasive Species

No invasive species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations, 2011 were recorded within the site boundary during the site visit.

#### 5.4.10 Significance of Habitats

Ecological evaluation within this section follows a methodology that is set out in Chapter 3 of the 'Guidelines for Assessment of Ecological Impacts of National Roads Schemes' (NRA, 2009).

No habitats which correspond to those listed in the EU Habitats Directive were identified during the site visit. The buildings and artificial surfaces (BL3), grassland habitats, spoil and bare ground, drainage ditches and scrub habitats that are present within the site, given their highly modified nature, are of *Local Importance (Lower Value)* as they contain areas which are of some local importance for wildlife.

Hedgerows/treelines and the depositing/lowland river habitat were assigned a significance of *Local Importance (Higher Value)* as these habitats have a higher level of biodiversity within the context of the local environment, and in the case of the hedgerows, treelines and watercourses provide cover and commuting corridor links between habitats of higher ecological value.

#### 5.4.11 Fauna in the Existing Environment

##### Birds

Records of birds seen and heard on the site of the proposed development were taken. Chiffchaff (*Phylloscopus collybita*), blackbird (*Turdus merula*), robin (*Erithacus rubecula*) and rook (*Corvus frugilegus*) were recorded incidentally within the site. No birds listed on Annex I of the EU Birds Directive were recorded during the field survey. The site provided habitat for a range of common and widespread species but is not of significance for rare or protected bird species. Given the lack of significant habitat for rare or protected bird species, there is no requirement for further bird surveys at the site.

##### Terrestrial Mammals

No evidence of badger was recorded during the site visit and no other protected mammal species or evidence of such species were recorded within the site boundaries.

No species listed under Annex II of the Habitats Directive were recorded during the site visit.

##### Otter

A comprehensive search for otter was undertaken along a 10m riparian buffer of the Gortgallan Stream (NRA, 2008 and Reid, et al 2013). No otter resting or breeding sites and no evidence of otter was recorded within the development site, however, the watercourse along the site boundary is likely to be utilised by commuting and foraging otter.

##### Bats

There are no structures within the site which may provide suitable roosting habitat for bats. A large open landscape structure dominates the site and though linear features may be used by foraging and commuting bats, overall, the site is considered to have *low suitability* for bat species.

#### 5.4.12 Significance of Fauna

No evidence of Annex listed species, or other species of conservation concern were recorded within the site boundaries.

Bird species recorded within the site boundaries are common generally and assigned a value of **Local Importance (Lower Value)**: The site of the proposed development provides some limited foraging, commuting and nesting habitats for these and other common bird species in general. Similar habitat is widespread in the locality.

#### 5.4.13 Impact Assessment

##### 5.4.13.1 'Do Nothing' Impact

Were the site to remain unplanted the management on site would likely remain as it is presently i.e. grazed by livestock and drained. However, given that the site has received Technical Approval from the Forest Service, as described above, it will be afforested per the provisions of the approval at a later date.

##### 5.4.13.2 Impact on Designated Sites

The site was subject to Article 6(3) Appropriate Assessment Screening as part of the technical approval process as per Table 5-2 above. There are no European sites within in the Zone of Likely Impact. The impact on nationally designated sites was assessed as per Table 5-3 above and there were no Natural Heritage Areas (NHA) or proposed Natural Heritage Areas (pNHAs) identified within the Zone of Likely Impact.

##### 5.4.13.3 Loss of Floral Habitat

###### Long-Term Neutral Impact

The development will result in the loss of some improved agricultural and poor wet grassland habitat and small areas of scrub habitat assigned local importance (lower value). These habitats are common in a local, national and international context and their loss will constitute a neutral impact.

The loss of these habitats is not considered significant.

All hedgerows and treelines of *Local Importance (Higher Value)* within the site will be retained.

###### Mitigation

Despite the fact that the loss of habitats on the site of the proposed development is not a significant ecological effect, all works will be carried out in accordance with the relevant Forest Service requirements, including 'Forestry Biodiversity Guidelines' (2000). All hedgerows and treelines will be retained and appropriate set-back applied as per the Forest Service document 'Environmental Requirements for Afforestation (2016)'. The Technical Approval document specifies the area that should contain suitable broadleaf and conifer species. This management would allow for the retention of some of the Local Value (Higher Importance) habitats.

###### Residual Impact

The replacement of agricultural grassland, wet grassland and scrub habitat with coniferous and broadleaf forestry is considered to be a Long-Term Neutral Impact. No significant effects are anticipated.

##### 5.4.13.4 Loss of Faunal Habitat

###### Long Term Neutral Impact

The proposed planting site is not of high value or importance as a faunal habitat, being dominated mostly by wet agricultural grassland with small areas of scrub throughout and limited cover or shelter for faunal species in scrub and hedgerow habitats. It is likely that the proposed planting of forestry will result in some loss of foraging for small mammals, along with local bird species. Grassland, hedgerow, treeline and scrub habitat is widespread in the local area and this loss is considered to be negligible.

The proposed development site does not provide significant foraging or roosting habitat for protected bird species given the highly managed/modified nature of habitats on site, dominated by improved agricultural grassland and wet grassland. Given the lack of significant bird assemblages recorded within or adjacent to the site, significant impacts as a result of disturbance or displacement are not anticipated on bird species at any geographic scale.

Hedgerows and treelines provide bat commuting and foraging habitat, there will be no loss of hedgerow or trees as part of the proposal and therefore no impacts on bat commuting and foraging habitat.

The afforestation, in particular that of broadleaf species will result in the creation of cover and nesting habitat for a range of bird species, resulting in an overall Long-Term Neutral Impact.

#### Mitigation / Best Practice

- All works will be carried out in accordance with the relevant Forest Service requirements, including 'Forestry Biodiversity Guidelines' (2000)'.
- All hedgerows and existing treelines will be retained and appropriate set-back applied as per the Forest Service document 'Environmental Requirements for Afforestation (2016)'.
- Vegetation clearance will be carried out in line with the Wildlife Acts

#### Residual Impact.

- No significant effects on faunal habitat as a result of the proposed afforestation is anticipated.

### 5.4.13.5 Water Pollution

#### Short-Term Slight Negative Impact

Following a precautionary approach, in the absence of best practice and design, there is potential for water pollution to occur through discharge to the adjacent stream to the north and drainage ditches and therefore potential localised water pollution effects in the form of release of suspended solids, siltation and erosion as a result of the proposed afforestation.

#### Mitigation/Best Practice

Best practice methods related to water incorporated into the forestry management and mitigation measures have been derived from:

- Forestry Commission (2004): *Forests and Water Guidelines*, Fourth Edition. Publ. Forestry Commission, Edinburgh;
- Coillte (2009): *Forest Operations & Water Protection Guidelines*;
- Forest Service (Draft): *Forestry and Freshwater Pearl Mussel Requirements - Site Assessment and Mitigation Measures*;
- Forest Service (2000): *Forestry and Water Quality Guidelines*. Forest Service, DAF, Johnstown Castle Estate, Co. Wexford.
- Forest Service (2016) *Environmental Requirements for Afforestation*. Forest Service, DAFM, Johnstown Castle Estate, Co. Wexford;
- DAFM (2015) *Forestry Standards Manual*; and
- DAFM (Oct 2019) *Standards for Felling and Restoration*.

Measures which will reduce the risk of entrainment of suspended solids and nutrient release in surface watercourses comprise best practice methods which will be applied at the replanting site. These include:

- Machine combinations will be chosen which are most suitable for ground conditions at the time of excavation and felling, and which will minimise surrounding soils disturbance;
- Where possible, existing drains will not be disturbed during drainage works;

- Drains and sediment traps will be installed during ground preparation and felling. Collector drains will be excavated at an acute angle to the contour (~0.3%-3% gradient), to minimise flow velocities. Main drains to take the discharge from collector drains will include water drops and rock armour, as required, where there are steep gradients, and should avoid being placed at right angles to the contour;
- Drains and silt traps will be maintained throughout all planting works, ensuring that they are clear of sediment build-up and are not severely eroded. Correct drain alignment, spacing and depth will ensure that erosion and sediment build-up are minimised and controlled;
- A 10-metre-wide (minimum) uncultivated and unplanted water setback will be applied along aquatic zones and a 5 metre set back at relevant watercourses (as defined in Circular 12/2017) located within or adjoining the site. This setback is to remain undisturbed during establishment and throughout the forest rotation. Apply and maintain as per details set out in Tables 5 and 6 of the Environmental Requirements for Afforestation (DAFM, 2016).
- the project will adhere to all water protection measures relating to cultivation, herbicide application, the location of onsite storage depots and the disposal of waste, set out in the Environmental Requirements for Afforestation (DAFM, 2016).
- There will be no woody weed removal within 50 m of an aquatic zone or 20 m of a relevant watercourse.

### Buffer Zones

There is a requirement in the Forest Service Code of Practice and in the FSC Certification Standard for the installation of buffer zones adjacent to aquatic zones at planting stage. Minimum buffer zone widths recommended in the Forest Service (2000) guidance document “*Forestry and Water Quality Guidelines*” are shown in Table 5-7.

Table 5-7 Minimum Buffer Zone Widths (Forest Service, 2000)

Average slope leading to the aquatic zone		Buffer zone width on either side of the aquatic zone	Buffer zone width for highly erodible soils
Moderate	(0 - 15%)	10 m	15 m
Steep	(15 - 30%)	15 m	20 m
Very steep	(>30%)	20 m	25 m

### Residual Impact.

- No significant impacts on water quality as a result of the proposed afforestation are anticipated.

### 5.4.13.6 Cumulative Impacts

The proposed afforestation has Technical Approval from the Forest Service and will be undertaken accordingly. This approval is conditional to all associated works being undertaken in accordance with Forest Service requirements. The impacts associated with this afforestation have been classified overall as a neutral impact. As such, when considered in combination with the other land uses in the area, and considering that the forestry guidelines are designed to minimise and prevent impacts to habitats that are outside the site, cumulative impacts on sensitive ecological receptors are not anticipated.

## 5.5 Replanting Site 2: Cloghaun More (West), Co. Clare

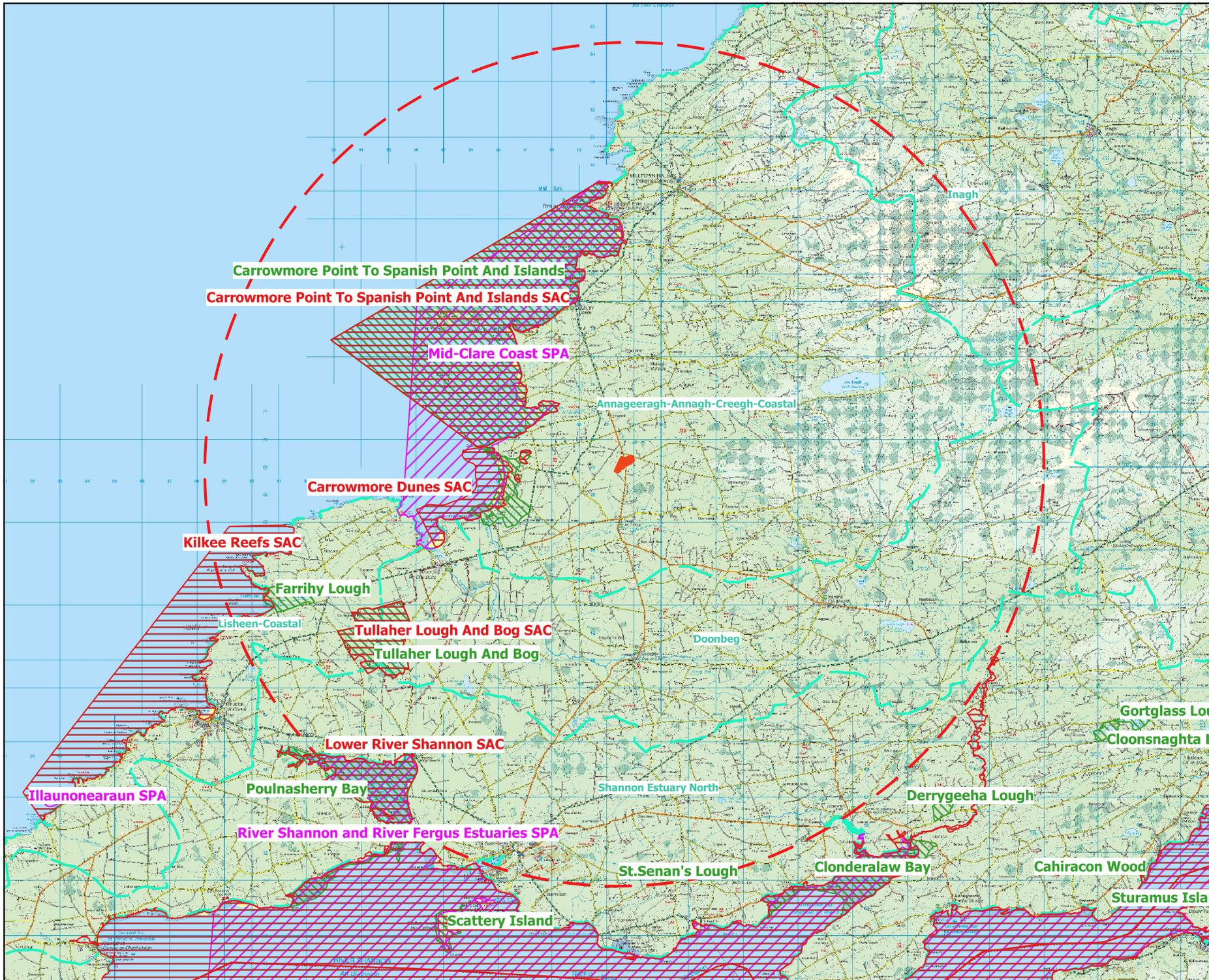
The proposed replanting land at Cloghaun More (West), Co. Clare has been assessed as part of the Afforestation Approval – Form 1 process described above and has obtained Technical Approval for Afforestation from the Forest Service. The site location is presented Figure 2-2.

### 5.5.1 Desk Study

The following sections detail the results of the searches of published material that were consulted as part of the desk study for the site at Cloghaun More.

### 5.5.2 Identification of the Designated Sites Likely Zone of Influence of the Project

Using the Geographic Information System (GIS) software MapInfo (Version 10.0), designated sites within a 15-kilometre radius of the proposed afforestation site were identified. Sites outside 15km were considered but no potential for impact was identified. The European designated sites are listed below in Table 5-8 and all Nationally designated sites are listed in Table 5-9. All designated sites are displayed in Figure 5-2.



**Map Legend**

- Special Area of Conservation
- Special Protection Area
- Proposed Natural Heritage Area
- Site Location
- 15km Buffer
- Hydrological Catchments

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**North Arrow**

Drawing Title  
All Designated Sites within 15km - Cloghaun More, Co. Clare

Project Title  
Curraglass Renewable Energy Development, Co. Cork

Drawn By: CS  
Checked By: JOS

Project No.: 190301  
Drawing No.: Figure 5-2

Scale: 1:180000  
Date: 10-06-2020

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Table 5-8 Identification of Designated sites within the Likely Zone of Impact

European Sites and distance from proposed development	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 05/03/2020	Conservation Objectives	Likely Zone of Impact Determination
<b>Special Areas of Conservation (SAC)</b>			
<p>Carrowmore Point To Spanish Point and Islands SAC (001021)</p> <p><b>Distance:</b> 2.9km</p>	<ul style="list-style-type: none"> <li>➤ Coastal lagoons [1150]</li> <li>➤ Reefs [1170]</li> <li>➤ Perennial vegetation of stony banks [1220]</li> <li>➤ Petrifying springs with tufa formation (<i>Cratoneurion</i>) [7220]</li> </ul>	<p>Detailed conservation objectives for this site (Version 1, April 2014) were reviewed as part of the assessment and are available at www.npws.ie.</p>	<p>There will be no direct effects as the project footprint is located entirely outside the designated site.</p> <p>Carrowmore Point to Spanish Point and Islands SAC is located approximately 2.9km north-west of the proposed afforestation site and are buffered by agricultural, forestry and peatland habitats. The site has hydrological connectivity with this SAC via a drainage ditch that flows along the western boundary of the site, which discharges to the Craggacknock West stream, a tributary stream of the Creegh River. The watercourse discharges to an expanse of open marine water 4.3km from Carrowmore Point to Spanish Point and Islands SAC.</p> <p>Given the nature and small scale of the proposed development (replanting only) and the distance of the SAC downstream, no pathway for indirect effects on the QIs of the SAC were identified.</p>

European Sites and distance from proposed development	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 05/03/2020	Conservation Objectives	Likely Zone of Impact Determination
			<p>No pathway for indirect effects on the QIs was identified.</p> <p><b>No pathway for significant effect was identified and the site is not within the Likely Zone of Impact.</b></p>
<p>Carrowmore Dunes SAC (002250)</p> <p><b>Distance:</b> 3.1km (9.1km hydrological distance)</p>	<ul style="list-style-type: none"> <li>➤ Reefs [1170]</li> <li>➤ Embryonic shifting dunes [2110]</li> <li>➤ Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) [2120]</li> <li>➤ Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]</li> <li>➤ <i>Vertigo angustior</i> (Narrow-mouthed Whorl Snail) [1014]</li> </ul>	<p>Detailed conservation objectives for this site (Version 1, March 2014) were reviewed as part of the assessment and are available at <a href="http://www.npws.ie">www.npws.ie</a></p>	<p>There will be no direct effects as the project footprint is located entirely outside the designated site.</p> <p>The proposed afforestation site has potential surface water connectivity &gt;9.1km downstream with Carrowmore Dunes SAC, via a drainage ditch that flows along the western boundary of the site to the west of the R483 which discharges to the Craggacknock West stream, a tributary stream of the Creagh River. Given the nature and small scale of the proposed development (replanting only) and the distance of the SAC downstream, no pathway for indirect effects on the aquatic QIs of the SAC were identified. No pathway for indirect effects on the terrestrial QIs of the SAC exist.</p>

European Sites and distance from proposed development	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 05/03/2020	Conservation Objectives	Likely Zone of Impact Determination
			<b>No pathway for effect was identified and the site is not within the Likely Zone of Impact.</b>
<p>Tullaher Lough And Bog SAC (002343)</p> <p><b>Distance:</b> 9.1km</p>	<ul style="list-style-type: none"> <li>➤ Active raised bogs [7110]</li> <li>➤ Degraded raised bogs still capable of natural regeneration [7120]</li> <li>➤ Transition mires and quaking bogs [7140]</li> <li>➤ Depressions on peat substrates of the <i>Rhynchosporion</i> [7150]</li> </ul>	<p>Detailed conservation objectives for this site (Version 1, December 2016) were reviewed as part of the assessment and are available at <a href="http://www.npws.ie">www.npws.ie</a></p>	<p>There will be no direct effects as the project footprint is located entirely outside the designated site.</p> <p>Tullaher Lough And Bog SAC is located in a separate hydrological sub-catchment to the proposed afforestation works and there is no connectivity between the afforestation site and the SAC designated for terrestrial habitats. Indirect impacts on these <b>QI</b> habitats can be ruled out due to terrestrial nature of the habitats, the distance from the proposed works area and the absence of a complete source-pathway-receptor chain for impact.</p> <p><b>No pathway for effect was identified and the site is not within the Likely Zone of Impact.</b></p>
<p>Kilkee Reefs SAC (002264)</p> <p><b>Distance:</b> 11.9km</p>	<ul style="list-style-type: none"> <li>➤ Large shallow inlets and bays [1160]</li> <li>➤ Reefs [1170]</li> <li>➤ Submerged or partially submerged sea caves [8330]</li> </ul>	<p>Detailed conservation objectives for this site (Version 1, August 2014) were reviewed as part of the assessment and are available at <a href="http://www.npws.ie">www.npws.ie</a></p>	<p>There will be no direct effects as the project footprint is located entirely outside the designated site.</p> <p>There is no hydrological connectivity between the proposed afforestation site and this coastal</p>

European Sites and distance from proposed development	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 05/03/2020	Conservation Objectives	Likely Zone of Impact Determination
			<p>SAC and therefore no potential for indirect effects on the SAC.</p> <p><b>No pathway for effect was identified and the site is not within the Likely Zone of Impact.</b></p>
<p>Lower River Shannon SAC (002165)</p> <p><b>Distance:</b> 12.3km</p>	<ul style="list-style-type: none"> <li>➤ Sandbanks which are slightly covered by sea water all the time [1110]</li> <li>➤ Estuaries [1130]</li> <li>➤ Mudflats and sandflats not covered by seawater at low tide [1140]</li> <li>➤ Coastal lagoons [1150]</li> <li>➤ Large shallow inlets and bays [1160]</li> <li>➤ Reefs [1170]</li> <li>➤ Perennial vegetation of stony banks [1220]</li> <li>➤ Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]</li> <li>➤ <i>Salicornia</i> and other annuals colonising mud and sand [1310]</li> <li>➤ Atlantic salt meadows (<i>Glaucopuccinellietalia maritimae</i>) [1330]</li> <li>➤ Mediterranean salt meadows (<i>Juncetalia maritimi</i>) [1410]</li> <li>➤ Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation [3260]</li> </ul>	<p>Detailed conservation objectives for this site (Version 1, August 2012) were reviewed as part of the assessment and are available at <a href="http://www.npws.ie">www.npws.ie</a></p>	<p>There will be no direct effects as the project footprint is located entirely outside the designated site.</p> <p>This European site is located in a separate hydrological catchment to the proposed afforestation works and there is no connectivity between the afforestation site and the SAC. No potential pathway for indirect effects was identified.</p> <p><b>No pathway for significant effect was identified and the site is not within the Likely Zone of Impact.</b></p>

European Sites and distance from proposed development	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 05/03/2020	Conservation Objectives	Likely Zone of Impact Determination
	<ul style="list-style-type: none"> <li>➤ Molinia meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinion caeruleae</i>) [6410]</li> <li>➤ Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnion incaeae</i>, <i>Salicion albae</i>) [91E0]</li> <li>➤ <i>Margaritifera margaritifera</i> (Freshwater Pearl Mussel) [1029]</li> <li>➤ <i>Petromyzon marinus</i> (Sea Lamprey) [1095]</li> <li>➤ <i>Lampetra planeri</i> (Brook Lamprey) [1096]</li> <li>➤ <i>Lampetra fluviatilis</i> (River Lamprey) [1099]</li> <li>➤ <i>Salmo salar</i> (Salmon) [1106]</li> <li>➤ <i>Tursiops truncatus</i> (Common Bottlenose Dolphin) [1349]</li> <li>➤ <i>Lutra lutra</i> (Otter) [1355]</li> </ul>		
<b>Special Protection Area (SPA)</b>			
<p>Mid-Clare Coast SPA (004182)</p> <p><b>Distance:</b> 2.9km (9.1km hydrological distance)</p>	<ul style="list-style-type: none"> <li>➤ Cormorant (<i>Phalacrocorax carbo</i>) [A017]</li> <li>➤ Barnacle Goose (<i>Branta leucopsis</i>) [A045]</li> <li>➤ Ringed Plover (<i>Charadrius hiaticula</i>) [A137]</li> <li>➤ Sanderling (<i>Calidris alba</i>) [A144]</li> </ul>	<p>Detailed conservation objectives for this site (Version 1, September 2014) were reviewed as part of the assessment and are available at www.npws.ie</p>	<p>There will be no direct effects as the project footprint is located entirely outside the designated site.</p> <p>The proposed afforestation site is located more than 9.1km upgradient of this coastal SPA and has hydrological connectivity via a drainage ditch that flows along the western</p>

European Sites and distance from proposed development	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 05/03/2020	Conservation Objectives	Likely Zone of Impact Determination
	<ul style="list-style-type: none"> <li>➤ Purple Sandpiper (<i>Calidris maritima</i>) [A148]</li> <li>➤ Dunlin (<i>Calidris alpina</i>) [A149]</li> <li>➤ Turnstone (<i>Arenaria interpres</i>) [A169]</li> <li>➤ Wetland and Waterbirds [A999]</li> </ul>		<p>boundary of the site which discharges to the Craggacknock West stream, a tributary stream of the Creegh River. Based on the nature and small scale of the works (replanting only) and the distance between the proposed development and the SPA no potential pathway for indirect effects on supporting wetland habitat for SCI species due to deterioration in water quality was identified.</p> <p>The replanting site does not support significant suitable habitat for the SCI species for which the SPA is designated. Therefore, no potential for indirect pathways as a result of disturbance were identified.</p> <p><b>No pathway for effect was identified and the site is not within the Likely Zone of Impact.</b></p>
<p>River Shannon and River Fergus Estuaries SPA (004077)</p> <p><b>Distance:</b> 12.3km</p>	<ul style="list-style-type: none"> <li>➤ Cormorant (<i>Phalacrocorax carbo</i>) [A017]</li> <li>➤ Whooper Swan (<i>Cygnus cygnus</i>) [A038]</li> <li>➤ Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) [A046]</li> <li>➤ Shelduck (<i>Tadorna tadorna</i>) [A048]</li> <li>➤ Wigeon (<i>Anas penelope</i>) [A050]</li> <li>➤ Teal (<i>Anas crecca</i>) [A052]</li> <li>➤ Pintail (<i>Anas acuta</i>) [A054]</li> <li>➤ Shoveler (<i>Anas clypeata</i>) [A056]</li> </ul>	<p>Detailed conservation objectives for this site (Version 1, September 2012) were reviewed as part of the assessment and are available at www.npws.ie</p>	<p>There will be no direct effects or disturbance related effects as the project footprint is located entirely outside the designated site.</p> <p>This European Site is located in a separate hydrological catchment to the proposed afforestation site. Therefore, no potential pathway for indirect effects on supporting wetland habitat for SCI species due to deterioration in water quality was identified.</p>

European Sites and distance from proposed development	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 05/03/2020	Conservation Objectives	Likely Zone of Impact Determination
	<ul style="list-style-type: none"> <li>➤ Scaup (<i>Aythya marila</i>) [A062]</li> <li>➤ Ringed Plover (<i>Charadrius hiaticula</i>) [A137]</li> <li>➤ Golden Plover (<i>Pluvialis apricaria</i>) [A140]</li> <li>➤ Grey Plover (<i>Pluvialis squatarola</i>) [A141]</li> <li>➤ Lapwing (<i>Vanellus vanellus</i>) [A142]</li> <li>➤ Knot (<i>Calidris canutus</i>) [A143]</li> <li>➤ Dunlin (<i>Calidris alpina</i>) [A149]</li> <li>➤ Black-tailed Godwit (<i>Limosa limosa</i>) [A156]</li> <li>➤ Bar-tailed Godwit (<i>Limosa lapponica</i>) [A157]</li> <li>➤ Curlew (<i>Numenius arquata</i>) [A160]</li> <li>➤ Redshank (<i>Tringa totanus</i>) [A162]</li> <li>➤ Greenshank (<i>Tringa nebularia</i>) [A164]</li> <li>➤ Black-headed Gull (<i>Chroicocephalus ridibundus</i>) [A179]</li> <li>➤ Wetland and Waterbirds [A999]</li> </ul>		<p>The replanting site does not support significant suitable habitat for the SCI species for which the SPA is designated. Therefore, no potential for indirect pathways as a result of disturbance were identified.</p> <p><b>No pathway for effect was identified and the site is not within the Likely Zone of Impact.</b></p>

Table 5-9 Identification of Nationally Designated sites within the Likely Zone of Impact

Designated Sites and distance from proposed development	Features of Interest	Likely Zone of Impact Determination
<b>Natural Heritage Area (NHA)</b>		
There are no NHA's within 15km of the proposed afforestation site		
<b>Proposed Natural Heritage Area (pNHA)</b>		
<p>Carrowmore Point To Spanish Point And Islands [001021]</p> <p><b>Distance:</b> 2.9km</p>	<p>➤ N/A</p>	<p>There will be no direct effects as the project footprint is located entirely outside the designated site.</p> <p>Carrowmore Point To Spanish Point And Islands pNHA is located approximately 2.9km north-west of the proposed afforestation site and are buffered by agricultural, forestry and peatland habitats. The site has hydrological connectivity with this SAC via a drainage ditch that flows along the western boundary of the site, which discharges to the Craggacnock West stream, a tributary stream of the Creegh River. The watercourse discharges to an expanse of open marine water 4.3km from Carrowmore Point to Spanish Point and Islands pNHA and SAC.</p> <p>Given the nature and small scale of the proposed development (replanting only) and the distance of the pNHA downstream, no pathway for indirect effects on the protected interests of the pNHA were identified.</p> <p><b>No pathway for effect was identified and the site is not within the Likely Zone of Impact.</b></p>

Designated Sites and distance from proposed development	Features of Interest	Likely Zone of Impact Determination
<p>White Strand/Carrowmore Marsh [001007]</p> <p><b>Distance:</b> 3.1km (8.5km hydrological distance)</p>	<p>➤ N/A</p>	<p>There will be no direct effects as the project footprint is located entirely outside the designated site.</p> <p>The proposed afforestation site has potential surface water connectivity in excess of 8.5km downstream with White Strand/Carrowmore Marsh pNHA via a drainage ditch that flows along the western boundary of the site, which discharges to the Craggaknock West stream, a tributary stream of the Creegh River. Given the nature and small scale of the proposed development (replanting only) and the distance of the pNHA downstream, no pathway for indirect effects on this coastal nationally designated pNHA was identified.</p> <p><b>No pathway for effect was identified and the site is not within the Likely Zone of Impact.</b></p>
<p>Tullaher Lough And Bog [000070]</p> <p><b>Distance:</b> 9.1km</p>	<p>➤ N/A</p>	<p>There will be no direct effects as the project footprint is located entirely outside the designated site.</p> <p>Tullaher Lough And Bog pNHA is located in a separate hydrological sub-catchment to the proposed afforestation works and there is no connectivity between the afforestation site and the nationally designated site. No potential pathway for indirect effects was identified.</p> <p><b>No pathway for effect was identified and the site is not within the Likely Zone of Impact.</b></p>
<p>Farrihy Lough [000200]</p>	<p>➤ N/A</p>	<p>There will be no direct effects as the project footprint is located entirely outside the designated site.</p>

Designated Sites and distance from proposed development	Features of Interest	Likely Zone of Impact Determination
<p><b>Distance:</b> 12.0km</p>		<p>There is no hydrological connectivity between the proposed afforestation site and this nationally designated site, located in a separate hydrological sub-catchment. Therefore, no pathway for indirect effect between the proposal and the designated site exists.</p> <p><b>No pathway for effect was identified and the site is not within the Likely Zone of Impact.</b></p>
<p>Poulnasherry Bay [000065]</p> <p><b>Distance:</b> 12.3km</p>	<p>➤ N/A</p>	<p>There will be no direct effects as the project footprint is located entirely outside the designated site.</p> <p>There is no hydrological connectivity between the proposed afforestation site and this coastal nationally designated site, as they are located in separate hydrological catchments. Therefore, no pathway for indirect effect between the proposal and the designated site exists.</p> <p><b>No pathway for effect was identified and the site is not within the Likely Zone of Impact.</b></p>
<p>St. Senan's Lough [001025]</p> <p><b>Distance:</b> 14.3km</p>	<p>➤ N/A</p>	<p>There will be no direct effects as the project footprint is located entirely outside the designated site.</p> <p>There is no hydrological connectivity between the proposed afforestation site and this nationally designated site, as they are located in separate hydrological catchments. Therefore, no pathway for indirect effect between the proposal and the designated site exists.</p>



Designated Sites and distance from proposed development	Features of Interest	Likely Zone of Impact Determination
		<b>No pathway for effect was identified and the site is not within the Likely Zone of Impact.</b>

### 5.5.3 New Flora Atlas

A search was made in the New Atlas of the British & Irish Flora (Preston et al, 2002) to investigate whether any rare or unusual plant species listed under Annex II of the EU Habitats Directive, Ireland Red List no 10 Vascular Plants (Wyse et.al 2016) or the Flora (Protection) Order, 2015 had been recorded in the relevant 10km square in which the study site is situated (R06), during the 1987-1999 atlas survey. No species protected under the Flora (Protection) Order, 1999 (as amended 2015) or Red listed species have been previously recorded within the hectad.

### 5.5.4 Biodiversity Ireland Database

A search of the National Biodiversity Data Centre (NBDC) database was conducted with a focus on records of protected flora and fauna recorded from hectad R06. The results of the database search (excluding birds) are provided below in Table 5-10 and the results for bird species recorded within the hectad are provided in Table 5-11. Table 5-12 includes records of non-native invasive species listed under the Third Schedule of the European Communities Regulations 2011 (S.I. 477 of 2015).

Table 5-10 NBDC records for species of conservation interest within 10km Grid Square R06 [excluding birds]

Common Name	Scientific Name	Designation
Bottle-nosed Dolphin	<i>Tursiops truncatus</i>	HD Annex II & IV, WA
Common frog	<i>Rana temporaria</i>	HD Annex V, WA
Daubenton's bat	<i>Myotis daubentonii</i>	HD Annex IV, WA
Eurasian badger	<i>Meles meles</i>	WA
European otter	<i>Lutra</i>	HD Annex II & IV, WA
Lesser noctule	<i>Nyctalus leisleri</i>	HD Annex IV, WA
Pine marten	<i>Martes</i>	HD Annex V, WA
Pipistrelle	<i>Pipistrellus pipistrellus sensu lato</i>	HD Annex IV, WA
Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	HD Annex IV, WA
West European hedgehog	<i>Erinaceus europaeus</i>	WA
Large White-moss	<i>Leucobryum glaucum</i>	HD Annex IV

WA = Wildlife Acts (1976-2019), HD Annex II, III, IV and V = EU Habitats Directive.

Table 5-11 NBDC records for bird species of conservation interest within 10km Grid Square R06

Common Name	Scientific Name	Designation
Barn Owl	<i>Tyto alba</i>	BoCCI Red List [Breeding], WA
Black-headed gull	<i>Larus ridibundus</i>	BoCCI Red List [Breeding], WA
Common kingfisher	<i>Alcedo atthis</i>	BD Annex I, WA

Corn crake	<i>Crex crex</i>	BD Annex I, BoCCI Red List [Breeding], WA
Eurasian curlew	<i>Numenius arquata</i>	BoCCI Red List [Breeding & Wintering], WA
Eurasian Wigeon	<i>Anas penelope</i>	BoCCI Red List [Wintering], WA
Eurasian Woodcock	<i>Scolopax rusticola</i>	BoCCI Red List [Breeding], WA
Grey wagtail	<i>Motacilla cinerea</i>	BoCCI Red List [Breeding], WA
Hen harrier	<i>Circus cyaneus</i>	BD Annex I, WA
Meadow pipit	<i>Anthus pratensis</i>	BoCCI Red List [Breeding], WA
Merlin	<i>Falco columbarius</i>	BD Annex I, WA
Northern lapwing	<i>Vanellus</i>	BoCCI Red List [Breeding & Wintering], WA
Red grouse	<i>Lagopus lagopus</i>	BoCCI Red List [Breeding], WA
Whooper swan	<i>Cygnus</i>	Annex I, WA
Yellowhammer	<i>Emberiza citrinella</i>	BoCCI Red List [Breeding], WA

WA = Wildlife Acts (1976-2019), BoCCI Red List = Birds of Conservation Concern Red List; BD Annex I = EU Birds Directive Annex I.

Table 5-12 NBDC records for invasive species in hectad R06

Common Name	Scientific Name
American Mink	<i>Mustela vison</i>
Fallow Deer	<i>Dama dama</i>
Japanese Knotweed	<i>Fallopia japonica</i>

### 5.5.5 Water Quality

The proposed afforestation site is located within the Mal Bay Hydrological Catchment. A drainage ditch flows along the western boundary of the site to the west of the R483 which discharges to the Craggaknock West stream, a tributary stream of the Creegh River.

River Waterbody WFD Status 2013-2018 for the Craggaknock West which the drainage ditch to the west drains to was given a 'Good' status and the Water Framework Directive (WFD) ground waterbody risk score for the site has been assessed as 'Good'. There are no Q Values for the Craggaknock West, a tributary of the Creegh River. A Q Value assessment of '4' as 'Good' from Creegh - Coomacreehaun Bridge located 5.8km downstream of the proposed afforestation site was recorded from 1991.

### 5.5.6 Freshwater Pearl Mussel Sensitive Areas

The site is located within a pearl mussel (*Margaritifera margaritifera*) sensitive area Annageeragh; in the category - Catchments of other extant populations. The Lower River Shannon SAC is designated for the freshwater pearl mussel (*Margaritifera margaritifera*) population within the Cloon catchment, and is located approximately 13.5km to the south east of the proposed afforestation site

### 5.5.7 Conclusions of the Desktop Study

The afforestation site is not located within any site designated for nature conservation. The mammal species recorded within the relevant hectad have widespread range and distributions and are likely to be recorded frequently throughout Ireland. A number of rare and protected flora and fauna have been recorded from the hectad in which the proposed development is located. The site is located within a pearl mussel (*Margaritifera margaritifera*) sensitive area but this is not within an *Margaritifera* SAC catchment.

### 5.5.8 Habitats Present

The site is split into three parcels of land, two parcels to the north-east and a larger parcel to the west separated by the R483.

The sections to the east was largely dominated by an **improved agricultural grassland (GA1)** with some areas of **wet grassland (GS4)** with field boundaries demarcated by **hedgerows (WL1)** and a few **treelines (WL2)** dominated by sitka spruce (*Picea sitchensis*) and a **drainage ditch (FW4)** along the northern boundary (Plate 5-4). Small areas of heavily poached ground throughout the site were categorised as **spoil and bare ground (ED2)**.

Species recorded within the grassland habitat included perennial ryegrass (*Lolium perenne*), broadleaved dock (*Rumex obtusifolius*), dandelion (*Taraxacum vulgaria*), red clover (*Trifolium pratense*), white clover (*Trifolium repens*), broadleaved dock (*Rumex obtusifolius*), rush species (*Juncus spp.*), lesser celandine (*Ficaria verna*).

Species recorded in the hedgerow habitat included primrose (*Primula vulgaris*), lesser celandine (*Ficaria verna*), bramble (*Rubus fruticosus agg.*), hawthorn (*Crataegus monogyna*), willow (*Salix spp.*), and gorse (*Ulex europaeus*).

An existing shed and stone walls to the centre of the site west of the eastern parcel along the R483 categorised as **buildings and artificial surfaces (BL3)** and **Stone walls and other stonework (BL1)** (Plate 5-5).

An ESB power line bisects the site separating the parcel east of the R483 into two and is categorised as **buildings and artificial surfaces (BL3)** (Plate 5-4).



Plate 5-4 Grassland areas within the site east of the R483 categorised as agricultural grassland (GA1) with some wet grassland (GS4). Field boundaries demarcated by hedgerows (WL1) and some treelines (WL2). ESB power line bisects the site separating the parcel east of the R483 into two categorised as buildings and artificial surfaces (BL3).



Plate 5-5 Small areas of heavily poached ground throughout the site were categorised as spoil and bare ground (ED2). Existing shed and associated stone categorised as buildings and artificial surfaces (BL3) and Stone walls and other stonework (BL1).

The site west of the R483 is largely dominated by poor quality **agricultural grassland (GA1)/dry meadows and grassy verges (GS2)** being grazed by horses and with some **wet grassland (GS4)** around parts of the site where there are areas of standing water. Areas of **scrub (WS1)** dominated by bramble (*Rubus fruticosus* agg.) with some areas of willow (*Salix* spp.), blackthorn (*Prunus spinosa*) and gorse (*Ulex europaeus*) are also growing within the site. Heavily poached areas throughout the site were categorised as **spoil and bare ground (ED2)**. A flowing **drainage ditch (FW4)** runs along the western and northern boundary and some field boundaries (Plate 5-6).

The field boundaries are demarcated by **hedgerows (WL1)** and some **treeline (WL2)** habitats dominated by hawthorn (*Crataegus monogyna*) with some ash (*Fraxinus excelsior*), willow (*Salix* spp.), blackthorn (*Prunus spinosa*), gorse (*Ulex europaeus*) and sitka spruce (*Picea sitchensis*) also present (Plate 5-7).

Species recorded within the grassland habitat included include cock's-foot (*Dactylus glomerata*), perennial rye-grass (*Lolium perenne*), Yorkshire fog (*Holcus lanatus*), rush species (*Juncus* spp.), bracken (*Pteridium aquilinum*), common bent (*Agrostis capillaris*), broadleaved dock (*Rumex obtusifolius*), rosebay willowherb (*Epilobium angustifolium*), creeping buttercup (*Ranunculus repens*), common chickweed (*Stellaria media*), herb-Robert (*Geranium robertianum*), ribwort plantain (*Plantago lanceolata*), sheep's sorrel (*Rumex acetosella*), red bartsia (*Odontites vernus*), selfheal (*Prunella vulgaris*) and creeping thistle (*Cirsium arvense*).

Waterlogged areas along the western site boundary drainage ditch had bulrush (*Typha latifolia*) growing as well as a section of willow (*Salix* spp.) in stagnant waterlogged areas categorised as **wet willow (WN6)** (Plate 5-8).

A section to the north-west of the site contained a small area of degraded, poor quality **lowland blanket bog (PB3)**. Species recorded in this habitat included typical species associated with peatlands: purple moor-grass (*Molinia caerulea*), rush species (*Juncus* spp.), bracken (*Pteridium aquilinum*), bog-myrtle (*Myrica Gale*) and Sphagnum mosses (*Sphagnum* spp.).

An access track runs south of the house and farm buildings which lie outside the site boundary categorised as **buildings and artificial surfaces (BL3)**. The track carries on from the unnamed road off the R483 into the farmyard to the north-east along the north-eastern boundary of the afforestation site was categorised as **spoil and bare ground (ED2)** with the centre and edges of the track classified as **recolonising bare ground (ED3)** (Plate 5-9)



Plate 5-6 A flowing drainage ditch (FW4) runs adjacent to the western and northern site boundary, Treelines (WL2) border the site in some areas. Grassland areas within the site west of the R483 to the north categorised as dry meadows and grassy verges (GS2) with some wet grassland (GS4) [view of the northern section of the western parcel]



*Plate 5-7 The site was dominated by an improved agricultural grassland (GA1)/wet grassland (GS4) mosaic with field boundaries demarcated by some hedgerows(WL1)/treelines (WL2). Heavily poached areas were categorised as spoil and bare ground (ED2).*



*Plate 5-8 Waterlogged areas categorised as Wet willow (WV6).A section of the site contained a small area of degraded, poor quality lowland blanket bog (PB3).*



Plate 5-9 Track to the north-east of the site categorised as Spoil and bare ground (ED2) with recolonising bare ground (ED3). Agricultural grassland/wet grassland (GAI/GS4) mosaic with treeline (WL2) field boundary to the west also visible.

### 5.5.9 Invasive Species

No invasive species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations, 2011 were recorded within the site boundary during the site visit.

### 5.5.10 Significance of Habitats

Ecological evaluation follows a methodology that is set out in Chapter 3 of the ‘Guidelines for Assessment of Ecological Impacts of National Roads Schemes’ (NRA, 2009). The habitats within and adjacent to the works site were evaluated in accordance with the criteria developed by the NRA (2009b), which classifies sites in terms of their ecological importance, i.e. ‘*international importance*’, ‘*national importance*’, ‘*county importance*’, ‘*local importance (higher value)*’ or ‘*local importance (lower value)*’.

No Annex I habitats associated with any nearby European Sites were recorded within the development boundary. **Lowland blanket bog (PB3)** can correspond to the annexed habitat Blanket Bog (\*if active bog) (7130), however, the PB3 habitat within this site does not correspond with the Annex I habitat. The examples found within the study site were degraded and small in size and not associated with any European site. Given the degraded nature of this habitat, it is assigned a significance of *Local Importance (Higher Value)*. Hedgerows, treelines and the wet willow habitat were also assigned a significance of *Local Importance (Higher Value)* as these habitats have a higher level of biodiversity within the context of the local environment, and in the case of the hedgerows and treelines provide links between habitats of higher ecological value.

The building and stone walls, grassland, scrub habitats, drainage ditches and bare ground that are present within the site, given their highly modified nature, are of *Local Importance (Lower Value)* as they contain areas which are of some local importance for wildlife.

## 5.5.11 Fauna in the Existing Environment

### Birds

Records of birds seen and heard on the site of the proposed development were taken. Rook (*Corvus frugilegus*), robin (*Erithacus rubecula*), wood pigeon (*Columba palumbus*), song thrush (*Turdus philomelos*) and wren (*Troglodytes troglodytes*) were recorded within the site. No birds listed on Annex I of the EU Birds Directive were recorded during the field survey. Given the lack of significant habitat for rare or protected bird species identified within the site, there is no requirement for further bird surveys at the site.

### Terrestrial Mammals

A number of mammal trails through the grassland and along the western site boundary from the main drainage ditch into the wet willow habitat were observed. These were likely created by deer in the area.

No evidence of badger or otter was recorded during the site visit and no other protected mammal species or evidence of such species were recorded within the site boundaries.

No species listed under Annex II of the Habitats Directive were recorded during the site visit.

### Bats

No evidence of roosting bat activity was observed on the exterior or interior of the galvanised shed to the east of the R483 site to be retained. There are potential access areas for bats due to the open access points and broken windows however there is little cover to provide shelter, warmth or block out light for this site to act as suitable roosting site. The suitability of this shed to host roosting bats was regarded as *Negligible*. There are no other structures within the site which may provide suitable roosting habitat for bats. Linear features and the area of willow habitat may be used by foraging and commuting bats, however, overall the site is considered to have low suitability for bat species.

## 5.5.12 Significance of Fauna

No evidence of Annex listed species, or other species of conservation concern were recorded within the site boundaries. In addition, no significant habitat for species of conservation concern including badger, otter, marsh fritillary was identified within the proposed afforestation site.

Bird species recorded within the site boundaries are common generally and assigned a value of **Local Importance (Lower Value)**. The site of the proposed development provides some limited foraging, commuting and nesting habitats for these and other common bird species in general. The linear habitats around the site and the wet willow habitat within the western land parcel do provide some foraging/commuting habitat for bats and are considered to be '*low suitability*' (Collins, 2016) bat habitat. Similar habitat is widespread in the locality. The one building on site within the eastern land parcels along the R483 was considered to be '*Negligible*' suitability for roosting bats.

## 5.5.13 Impact Assessment

### 5.5.13.1 'Do Nothing' Impact

Were the site to remain unplanted the management on site would likely remain as it is presently i.e. low-quality wet agricultural grassland grazed by livestock, with areas of degraded blanket bog, scrub and drained. Some treelines, hedgerows and drainage ditches demarcating field boundaries. However, given that the site has received Technical Approval from the Forest Service as described above it will be afforested per the provisions of the approval at a later date.

### 5.5.13.2 Impact on Designated Sites

The site was subject to Article 6(3) Appropriate Assessment Screening as part of the technical approval process as per Table 5-8 above. There are no European sites within in the Zone of Likely Impact. The impact on nationally designated sites was assessed as per Table 5-9 above and there was no National Heritage Areas (NHA) or proposed National Heritage Areas (pNHAs) identified within the Zone of Likely Impact.

### 5.5.13.3 Loss of Floral Habitat

#### Long-Term Neutral Impact

The development will result in the loss of wet agricultural grassland and scrub habitat assigned local importance (lower value). These habitats are common in a local, national and international context and their loss will constitute a neutral impact. The development will also result in the loss of a small area of degraded lowland blanket bog assigned Local importance (higher value). Given the degraded nature and very small size of this habitat the loss is not considered to be significant.

The impacted habitats are not considered to be of ecological sensitivity and their loss will constitute a neutral impact. The loss of these habitats is not considered significant.

The treelines, hedgerows and wet willow areas within the site will be retained and no instream works will take place.

#### Mitigation / Best Practice

Despite the fact that the loss of habitats on the site of the proposed development is not a significant ecological effect, all works will be carried out in accordance with the relevant Forest Service requirements, including 'Forestry Biodiversity Guidelines' (2000). All boundary hedgerows and existing treelines will be retained and appropriate set-back applied as per the Forest Service document 'Forestry Standards Manual (2015)' and the 'Standards for Felling and Reforestation (DAFM, 2009)'. The Technical Approval document specifies the area that should contain a suitable broadleaf and conifer species. This management would allow for the retention of these Local Value (*Higher Importance*) habitats.

#### Residual Impact

The loss of wet agricultural grassland, scrub habitats and a small area of degraded lowland blanket bog with forestry is considered to be a Long-Term Neutral Impact. No significant effects are anticipated.

### 5.5.13.4 Loss of Faunal Habitat

#### Long Term Neutral Impact

The proposed planting site is not of high value or importance as a faunal habitat, being dominated mostly by grassland habitats, consisting of wet agricultural grassland with some dry meadows and scrub throughout and limited cover or shelter for faunal species in scrub and hedgerow habitats. It is likely that the proposed planting of forestry will result in some loss of foraging habitat for common species such as deer and shelter for small mammals, along with local bird species. This habitat is widespread in the local area and this loss is considered to be negligible.

The proposed development site does not provide significant foraging or roosting habitat for protected bird species given the highly managed/modified nature of habitats on site, dominated by wet agricultural grassland and dry meadows and areas of scrub. Given the lack of significant bird assemblages recorded within or adjacent to the site, significant impacts as a result of disturbance or displacement are not anticipated on bird species at any geographic scale.

Treelines and hedgerow provide bat commuting and foraging habitat, there will be no loss of linear habitat as part of the proposal and therefore no impacts on bat commuting and foraging habitat.

The afforestation, in particular that of broadleaf species will result in the creation of cover and nesting habitat for a range of bird species, resulting in an overall Long-Term Neutral Impact.

#### Mitigation / Best Practice

- All works will be carried out in accordance with the relevant Forest Service requirements, including 'Forestry Biodiversity Guidelines' (2000)
- All hedgerows and existing treelines will be retained and appropriate set-back applied as per section 2.5.4 of the Forest Service document 'Environmental Requirements for Afforestation (2016)'
- Vegetation clearance will be carried out in line with the Wildlife Acts

#### Residual Impact.

- No significant effects on faunal habitat as a result of the proposed afforestation is anticipated.

### 5.5.13.5 Water Pollution

#### Short-Term Slight Negative Impact

Following a precautionary approach, in the absence of best practice design, there is potential for small scale water pollution of the small drainage ditch on site and water localised pollution effects in the form of release of suspended solids, siltation and erosion as a result of the proposed afforestation.

#### Mitigation

Best practice methods related to water incorporated into the forestry management and mitigation measures have been derived from:

- Forestry Commission (2004): *Forests and Water Guidelines*, Fourth Edition. Publ. Forestry Commission, Edinburgh;
- Coillte (2009): *Forest Operations & Water Protection Guidelines*;
- Forest Service (Draft): *Forestry and Freshwater Pearl Mussel Requirements - Site Assessment and Mitigation Measures*; and,
- Forest Service (2000): *Forestry and Water Quality Guidelines*. Forest Service, DAF, Johnstown Castle Estate, Co. Wexford.
- Forest Service (2016) *Environmental Requirements for Afforestation*. Forest Service, DAF, Johnstown Castle Estate, Co. Wexford.
- *Forestry Standards Manual* (DAFM, 2015).

Measures which will reduce the risk of entrainment of suspended solids and nutrient release in surface watercourses comprise best practice methods which will be applied at the replanting site. These include:

- Machine combinations will be chosen which are most suitable for ground conditions at the time of excavation and felling, and which will minimise surrounding soils disturbance;
- Where possible, existing drains will not be disturbed during drainage works;
- Drains and sediment traps will be installed during ground preparation and felling. Collector drains will be excavated at an acute angle to the contour (~0.3%-3% gradient), to minimise flow velocities. Main drains to take the discharge from collector drains will include water drops and rock armour, as required, where there are steep gradients, and should avoid being placed at right angles to the contour;
- Drains and silt traps will be maintained throughout all planting works, ensuring that they are clear of sediment build-up and are not severely eroded. Correct drain alignment, spacing and depth will ensure that erosion and sediment build-up are minimised and controlled;
- Apply a 5 metre wide (minimum) uncultivated and unplanted water setback along relevant watercourses (as defined in Circular 12/2017) located within or adjoining the site. This setback is to remain undisturbed during establishment and throughout the

- forest rotation. Apply and maintain as per details set out in Tables 5 and 6 of the Environmental Requirements for Afforestation (DAFM, 2016).
- Adhere to all water protection measures relating to cultivation, herbicide application, the location of onsite storage depots and the disposal of waste, set out in the *Environmental Requirements for Afforestation* (DAFM, 2016).
  - There will be no woody weed removal within 20 m of a drainage ditch.

### Buffer Zones

There is a requirement in the Forest Service Code of Practice and in the FSC Certification Standard for the installation of buffer zones adjacent to aquatic zones at planting stage. Minimum buffer zone widths recommended in the Forest Service (2000) guidance document “*Forestry and Water Quality Guidelines*” are shown in Table 5-13.

Table 5-13 Minimum Buffer Zone Widths (Forest Service, 2000)

Average slope leading to the aquatic zone		Buffer zone width on either side of the aquatic zone	Buffer zone width for highly erodible soils
Moderate	(0 - 15%)	10 m	15 m
Steep	(15 - 30%)	15 m	20 m
Very steep	(>30%)	20 m	25 m

### Residual Impact

No significant impacts on water quality are anticipated as a result of any element of the proposed afforestation.

#### 5.5.13.6 Cumulative Impacts

The proposed afforestation has Technical Approval from the Forest Service and will be undertaken accordingly. This approval is conditional to all associated works being undertaken in accordance with Forest Service requirements. The impacts associated with this afforestation have been classified overall as a neutral impact. As such, when considered in combination with the other land uses in the area, and considering that the forestry guidelines are designed to minimise and prevent impacts to habitats that are outside the site, cumulative impacts on sensitive ecological receptors are not anticipated.

## 6. LAND, SOILS AND GEOLOGY

### 6.1 Introduction

This section of the report provides baseline information on the environmental setting of the approved afforestation lands in terms of soils and geology and discusses the potential impacts and associated effect that the activity may have on them. Where required, appropriate mitigation measures to limit any identified significant impacts to land, soils and geology are recommended.

#### 6.1.1 Desk Study

This desk study involved collecting all relevant geological data for each site and its surrounding area. This included consultation of the following resources:

- Environmental Protection Agency database ([www.epa.ie](http://www.epa.ie))
- Geological Survey of Ireland (GSI) - National Draft Bedrock Aquifer Map
- Geological Survey of Ireland - Groundwater Database ([www.gsi.ie](http://www.gsi.ie))
- Bedrock Geology 1:100,000 Scale Map Series. (GSI, 2003)
- Geological Survey of Ireland - 1:25,000 Field Mapping Sheets
- General Soil Map of Ireland, 2nd edition ([www.epa.ie](http://www.epa.ie))

#### 6.1.2 Impact Assessment Methodology

Using information from the desk study, an estimation of the importance of the soil and geological environment within each of the study areas is assessed using the criteria set out in the *Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes* (NRA, 2005) and presented below in Table 6-1.

Table 6-1 Estimation of Importance of Soil and Geology Criteria (NRA, 2005)

Importance	Criteria	Typical Example
<b>Very High</b>	Attribute has a high quality, significance or value on a regional or national scale. Degree or extent of soil contamination is significant on a national or regional scale. Volume of peat and/or soft organic soil underlying route is significant on a national or regional scale.	Geological feature rare on a regional or national scale (NHA). Large existing quarry or pit. Proven economically extractable mineral resource.
<b>High</b>	Attribute has a high quality, significance or value on a local scale. Degree or extent of soil contamination is significant on a local scale. Volume of peat and/or soft organic soil underlying site is significant on a local scale.	Contaminated soil on site with previous heavy industrial usage. Large recent landfill site for mixed wastes. Geological feature of high value on a local scale (County Geological Site). Well drained and/or highly fertility soils. Moderately sized existing quarry or pit. Marginally economic extractable mineral resource.
<b>Medium</b>	Attribute has a medium quality, significance or value on a local scale. Degree or extent of soil contamination is moderate on a local scale. Volume of peat and/or soft organic soil underlying site is moderate on a local scale.	Contaminated soil on site with previous light industrial usage. Small recent landfill site for mixed wastes. Moderately drained and/or moderate fertility soils. Small existing quarry or pit.

Importance	Criteria	Typical Example
		Sub-economic extractable mineral resource.
<b>Low</b>	Attribute has a low quality, significance or value on a local scale. Degree or extent of soil contamination is minor on a local scale. Volume of peat and/or soft organic soil underlying site is small on a local scale.	Large historical and/or recent site for construction and demolition wastes. Small historical and/or recent landfill site for construction and demolition wastes. Poorly drained and/or low fertility soils. Uneconomically extractable mineral resource.

The statutory guidelines (EPA, 2017, 2003 and 2002) for the assessment of impacts require that likely impacts are described with respect to their extent, magnitude, complexity, probability, duration, frequency, reversibility and trans-frontier nature (if applicable). The descriptors used in the EIAR are those set out by the EPA (EPA, 2017) Glossary of Impacts as shown in Chapter 1 of the EIAR which accompanied the application. In addition, the two impact characteristics, proximity and probability, are described for each impact, and these are defined in Table 6-2.

In order to provide an understanding of this descriptive system in terms of the geological/hydrological environment, elements of this system of description of impacts are related to examples of potential impacts on the hydrology and morphology of the existing environment, as listed in Table 6-3.

Table 6-2 Additional Impact Characteristics

Impact Characteristic	Degree / Nature	Description
<b>Proximity</b>	Direct	An impact which occurs within the area of the proposed project, as a direct result of the proposed project.
	Indirect	An impact which is caused by the interaction of effects, or by off-site developments.
<b>Probability</b>	Low	A low likelihood of occurrence of the impact.
	Medium	A medium likelihood of occurrence of the impact.
	High	A high likelihood of occurrence of the impact.

Table 6-3 Impact Descriptors Related to the Receiving Environment

Impact Characteristics		Potential Hydrological Impacts
Quality	Significance	
Negative Only	Profound	Widespread permanent impact on: - The extent or morphology of a cSAC. - Regionally important aquifers. - Extents of floodplains. Mitigation measures are unlikely to remove such impacts.
Positive or Negative	Significant	Local or widespread time-dependent impacts on: -The extent or morphology of a cSAC / ecologically important area. -A regionally important hydrogeological feature (or widespread effects to minor hydrogeological features). -Extent of floodplains. Widespread permanent impacts on the extent or morphology of an NHA/ecologically important area. Mitigation measures (to design) will reduce but not completely remove the impact – residual impacts will occur.
Positive or Negative	Moderate	Local time-dependent impacts on: - The extent or morphology of a cSAC / NHA / ecologically important area. - A minor hydrogeological feature. - Extent of floodplains. Mitigation measures can mitigate the impact OR residual impacts occur, but these are consistent with existing or emerging trends.
Positive, Negative or Neutral	Slight	Local perceptible time-dependent impacts not requiring mitigation.
Neutral	Imperceptible	No impacts, or impacts which are beneath levels of perception, within normal bounds of variation, or within the bounds of measurement or forecasting error.

## 6.2 Proposed Replanting Lands

### 6.2.1 Replanting Area 1: Sheehaun, Co. Roscommon

#### 6.2.1.1 Geology and Subsoils

Information on the main geological formations and subsoils underlying Replanting Area 1 (Sheehaun) is shown in Table 6-4.

Table 6-4 Geology and Subsoil Information - Sheehaun, Co. Roscommon

Site	Geological Formation	Subsoil Type
Sheehaun	Ballysteen Formation consisting of Dark muddy limestone, shale.	Sandstone and Shale Till

The site at Sheehaun is underlain by sandstone and shale till over the Ballysteen Formation which is comprised of Dark muddy limestone and shale.

The surrounding area is largely underlain by sandstone and shale till with areas of cutover peat overlying the Ballysteen Formation.

### 6.2.1.2 Geological Resource Importance

The GSI online Aggregate Potential Mapping Database shows that the proposed development site is located within an area mapped as having a Very Low Potential in terms of crushed rock aggregate potential. The GIS database shows the site does not have granular aggregate potential (i.e. potential for gravel reserves).

The limestone bedrock at the site could be classified as “Medium” importance and has the potential to be used on a “sub-economic” local scale for construction purposes. The bedrock has not been used in the past at the site for this purpose, and the proposed development does not propose to do so.

The site is mainly till with noted peat deposits east of the site. This could be classified as “low” importance. While peat has not been cut at this site, it is not designated in this area, is of a small volume, is used for agricultural purposes and is poorly drained. Refer to Table 6-1 for criteria.

### 6.2.1.3 Geological Heritage and Designated Sites

There are no recorded Geological Heritage sites, mineral deposit sites or mining sites (current or historic) within the proposed development area.

### 6.2.1.4 Potential Impacts

#### 6.2.1.4.1 ‘Do-Nothing’ Scenario

The lands have been Technically Approved and will be afforested should the Curraglass Renewable Energy Development proceed or not.

#### 6.2.1.4.2 Likely and Significant Impacts and Associated Mitigation Measures

The likely impacts of the proposed development and mitigation measures that will be put in place to eliminate or reduce them are described below.

##### Construction of Drains and Planting of Trees

There will be some minor disturbance of soils, associated with the construction of drains through the site. Planting of trees will be carried out by hand using the slit planting method, so soil disturbance from this will not be significant. There are no likely impacts of this afforestation on the underlying geology.

##### Construction of Site Roads and Tracks

Forestry felling can occur within 0.8 -1.0 km of access points (roads and tracks) to the main forest body. Due to the small size of this site, additional access tracks or roads will not be required. This site is located adjacent to an existing road network with existing entrances which will not require alteration.

#### 6.2.1.4.3 Mitigation Measures

Planting of trees will be carried out by hand. Any drains will be generally shallow and will be constructed in accordance with the forestry service best practice guidelines described in detail in Section 2. Soils will remain in-situ at the site and will not be removed off-site.

#### 6.2.1.4.4 Residual Impact

There will be imperceptible impacts on soils and geology associated with the proposed afforestation.

#### 6.2.1.4.5 Significance of the Effects

Based on the above, there will be no significant effects on soils and geology at this site.

## 6.2.2 Replanting Area 2: Cloghaun More, Co. Clare

### 6.2.2.1 Geology and Subsoils

Information on the main geological formations and subsoils underlying Replanting Area 2 (Cloghaun More) is shown in Table 6-5.

Table 6-5 Geology and Subsoil Information - Cloghaun More, Co. Clare

Site	Geological Formation	Subsoil Type
Cloghaun More	Gull Island Formation consisting of Grey siltstone & sandstone. Central Clare Group consisting of a Sandstone, siltstone & mudstone	Shales and sandstones till Blanket Peat.

The site and the surrounding area at Cloghaun More is underlain by shale and sandstone till, blanket bog over the Gull Island Formation and the Central Clare Group Formation.

### 6.2.2.2 Geological Resource Importance

The GSI online Aggregate Potential Mapping Database shows that the Proposed Development site is located within an area mapped as being typically Low to High in terms of crushed rock aggregate potential and with no potential for granular aggregate potential (i.e. potential for gravel reserves).

The siltstone/sandstone bedrock at the site could be classified as “Medium” importance and has the potential to be used on a “sub-economic” local scale for construction purposes. The bedrock has not been used in the past at the site for this purpose, and the proposed development does not propose to do so.

The site peat deposits at the site could be classified as “low” importance. While peat has not been cut at this site, it is not designated in this area, is of a small volume, is used for agricultural purposes and is poorly drained. Refer to Table 6-1 for criteria.

### 6.2.2.3 Geological Heritage and Designated Sites

There are no recorded Geological Heritage sites, mineral deposit sites or mining sites (current or historic) within the proposed development area.

### 6.2.2.4 Potential Impacts

#### 6.2.2.4.1 ‘Do-Nothing’ Scenario

The lands have been Technically Approved and will be afforested should the Curraglass Renewable Energy Development proceed or not.

#### 6.2.2.4.2 Likely and Significant Impacts and Associated Mitigation Measures

The likely impacts of the proposed development and mitigation measures that will be put in place to eliminate or reduce them are described below.

#### Construction of Drains and Planting of Trees

There will be some minor disturbance of soils, associated with the construction of drains through the site. Planting of trees will be carried out by hand using the slit planting method, so soil disturbance from this will not be significant. There are no likely impacts of this afforestation on the underlying geology.

#### Construction of Site Roads and Tracks

Forestry felling can occur within 0.8 -1.0 km of access points (roads and tracks) to the main forest body. Due to the small size of this site, additional access tracks or roads will not be required. This site is located adjacent an existing road network with existing entrances which will not require alteration.

#### 6.2.2.4.3 **Mitigation Measures**

Planting of trees will be carried out by hand. Any drains will be generally shallow and will be constructed in accordance with the forestry service best practice guidelines described in detail in Section 2. Soils will remain in-situ at the site and will not be removed off-site.

#### 6.2.2.4.4 **Residual Impact**

There will be imperceptible impacts on soils and geology associated with the proposed afforestation.

#### 6.2.2.4.5 **Significance of the Effects**

Based on the above, there will be no significant effects on soils and geology at this site.

## 7. HYDROLOGY AND HYDROGEOLOGY

### 7.1 Introduction

#### 7.1.1 Background and Objectives

MKO was engaged to undertake an assessment of the potential impacts and associated effect of forestry planting at 2 no. replanting site locations on water aspects (hydrology and hydrogeology) of the receiving environment. The objective of the assessment is to:

- Produce a baseline study of the existing water environment (surface and groundwater) in the area of the site locations;
- Identify likely positive and negative impacts of the proposed development on surface and groundwater during all phases of the development; and,
- Identify mitigation measures to avoid, remediate or reduce significant negative impacts.

This section of the report provides baseline information on the environmental setting of the approved afforestation sites in terms of hydrology and hydrogeology and discusses the potential impacts that the activity may have on them. Where required, appropriate mitigation measures to limit any identified significant impacts to site hydrology and hydrogeology are recommended.

#### 7.1.2 Methodology

##### 7.1.2.1 Desk Study

A desk study of the site and the surrounding areas involved collecting all relevant geological, hydrological, hydrogeological and meteorological data for the area. This included consultation with the following resources:

- Environmental Protection Agency database ([www.epa.ie](http://www.epa.ie));
- Geological Survey of Ireland – Spatial Resources Map ([www.gsi.ie](http://www.gsi.ie));
- Met Eireann Meteorological Databases ([www.met.ie](http://www.met.ie));
- National Parks & Wildlife Services Public Map Viewer ([www.npws.ie](http://www.npws.ie));
- Water Framework Directive “WaterMaps” Map Viewer ([www.wfdireland.ie](http://www.wfdireland.ie));
- OPW Flood Maps ([www.floodinfo.ie](http://www.floodinfo.ie)); and
- Department of Environment, Community and Local Government on-line mapping viewer ([www.myplan.ie](http://www.myplan.ie)).

##### 7.1.2.2 Impact Assessment Methodology

Please refer to Section 1 of the EIAR which accompanied the application for details on the impact assessment methodology (EPA, 2002, 2003 & 2017). In addition to the above methodology the sensitivity of the water environment receptors were assessed on completion of the desk study. Levels of sensitivity which are defined in Table 7-1 are then used to assess the potential effect that the proposed development may have on them.

Table 7-1 Receptor Sensitivity Criteria (adapted from [www.sepa.org.uk](http://www.sepa.org.uk))

Sensitivity of Receptor	
Not Sensitive	Receptor is of low environmental importance (e.g. surface water quality classified by EPA as A3 waters or seriously polluted), fish sporadically present or restricted). Heavily engineered or artificially modified and may dry up during summer months. Environmental equilibrium is stable and is resilient to changes which are considerably greater than natural

Sensitivity of Receptor	
	fluctuations, without detriment to its present character. No abstractions for public or private water supplies. GSI groundwater vulnerability “Low” - “Medium” classification and “Poor” aquifer importance.
Sensitive	Receptor is of medium environmental importance or of regional value. Surface water quality classified by EPA as A2. Salmonid species may be present and may be locally important for fisheries. Abstractions for private water supplies. Environmental equilibrium copes well with all natural fluctuations but cannot absorb some changes greater than this without altering part of its present character. GSI groundwater vulnerability “High” classification and “Locally” important aquifer.
Very Sensitive	Receptor is of high environmental importance or of national or international value i.e. NHA or SAC. Surface water quality classified by EPA as A1 and salmonid spawning grounds present. Abstractions for public drinking water supply. GSI groundwater vulnerability “Extreme” classification and “Regionally” important aquifer.

## 7.2 Proposed Drainage

The proposed replanting lands will be drained in accordance with the Forestry Guidelines. Forestry plantations are generally drained by a network of mound drains which typically run perpendicular to the topographic contours of the site and feed into collector drains, which discharge to interceptor drains down-gradient of the plantation.

Mound drains are generally spaced approximately every 15m. Interceptor drains are generally located up-gradient (cut-off drains) and down-gradient of forestry plantations. A schematic of a typical standard forestry drainage network and one which is representative of the proposed site drainage network is shown in Figure 2-3 of this report.

## 7.3 Replanting Area 1: Sheehaun, Co. Roscommon

### 7.3.1 Baseline Environment and Local Hydrology

Ground level elevations range between approximately 43m and 50m AOD (meters above Ordnance Datum).

There are no streams or rivers within the site or adjacent to the site boundary. The closest watercourse to the site is the Gortgallan Stream, which runs along the northern border of the site, draining in an easterly direction, before flowing into the River Shannon approximately 5.8km downstream of the proposed replanting site. The proposed afforestation site is located within the Upper Shannon Catchment [26C].

There are numerous manmade drains within the site and surrounds that are in place predominately to drain the surrounding lands for agricultural purposes and the neighbouring forestry plantations.

#### 7.3.1.1 Water Balance

While the process of afforestation may result in a slight alteration in the water runoff of the site, the small size of the site (0.073 km<sup>2</sup>) when compared with the Upper Shannon Catchment (1,500 km<sup>2</sup>) means that any potential impacts this may have would be insignificant. The afforestation will lead to an imperceptible reduction in the runoff volumes in the longer term as the trees mature.

### 7.3.1.2 Regional Hydrology

Under the Water Framework Directive (WFD), the site is located within the Upper Shannon Catchment (Catchment ID26C) and Shannon[Upper]\_SC\_070 sub catchment (Sub catchment ID26C-8). The Upper Shannon catchment comprises 12 sub catchments with 58 river water bodies, 23 lake water bodies and 15 groundwater bodies.

### 7.3.1.3 Flood Risk Identification

OPW's river and coastal flood maps ([www.floodinfo.ie](http://www.floodinfo.ie)) and the Department of Housing, Planning and Local Government on-line planning mapping ([www.myplan.ie](http://www.myplan.ie)) were consulted to identify those areas as being at risk of flooding.

No records or risks associated with flooding were identified in the published data sets.

### 7.3.1.4 Surface Water Hydrochemistry

The limestone and shale bedrock (and related till subsoils) which underlie the area would have slightly alkaline groundwater characteristics which would have some effect on surface water chemistry specifically during dry periods when baseflow is likely to be more prevalent.

### 7.3.1.5 Hydrogeology

The underlying bedrock at the site is mapped as being comprised of Dark muddy limestone and shale. (refer to Section 6 - Soils & Geology). The GSI has classified the bedrock formation here as a Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones.

### 7.3.1.6 Groundwater Vulnerability

The GSI and EPA has assigned a groundwater vulnerability rating of 'Medium' to the majority of the site with areas of 'Low' vulnerability.

### 7.3.1.7 Surface Water Body Status

The EU Water Framework Directive aims to protect, enhance and restore all waters with aim to achieve at least good status by 2027.

The Water Framework Directive Status Report 2013 - 2018, published by the EPA has classified the Gortcallan stream as having an 'unassigned' status. The EPA has classified the Gortcallan stream as being 'Under review'.

### 7.3.1.8 Groundwater Body Status

The EPA has classified the groundwater within the aquifer underlying the site as being of 'Good' status and 'Not at Risk'.

### 7.3.1.9 Designated Sites and Habitats

Designated sites include National Heritage Areas (NHAs), Proposed National Heritage Areas (pNHAs) Special Areas of Conservation (SACs), candidate Special Areas of Conservation (cSAC) and Special Protection Areas (SPAs). The proposed forestry development site is not located within any designated conservation site. Designated sites in proximity to the proposed development site are described Section 5, Flora and Fauna.

### 7.3.1.10 Water Resources

There are no verified or unverified borehole wells located within 100 metres of the replanting lands, according to www.gsi.ie.

### 7.3.1.11 Receptor Sensitivity

Due to the nature of afforestation, being near surface construction activities, impacts on groundwater are generally negligible and surface water is generally the main sensitive receptor assessed during impact assessments. The primary risk to groundwater at the site would be from nutrients associated with fertilisers.

Based on criteria set out in Table 7-1 groundwater at the site can be classed as ‘Sensitive’ to pollution given the bedrock is classified as a locally important Aquifer. However, the majority of the site is covered in sandstone and shale till and peat which acts as a protective cover to the underlying aquifer. Any contaminants which may be accidentally released on-site are more likely to travel to nearby streams within surface runoff.

Surface waters such as the Gortgallan Stream are sensitive to potential contamination. Surface water mitigation and controls are outlined in Section 7.3.4 below to ensure the protection of all downstream receiving waters. Mitigation measures will ensure that surface runoff from the afforested areas of the site will be of a high quality and will therefore not impact on the quality of downstream surface water bodies.

## 7.3.2 Proposed Site Drainage

The site will be drained in accordance with the Forestry Guidelines. Forestry plantations are generally drained by a network of mound drains which typically run perpendicular to the topographic contours of the site and feed into collector drains, which discharge to interceptor drains down-gradient of the plantation.

Mound drains are generally spaced approximately every 15m. As illustrated in Figure 2-3, Interceptor drains are generally located up-gradient (cut-off drains) and down-gradient of forestry plantations. A schematic of a typical standard forestry drainage network and one which is representative of the proposed site drainage network is shown above as Figure 2-3.

## 7.3.3 Proposed Drainage Management

Runoff control and drainage management are key elements in terms of mitigation against impacts on surface water bodies. Two distinct methods will be employed to manage drainage water within the proposed development. The first method involves ‘keeping clean water clean’ by avoiding disturbance to natural drainage features. The second method involves collecting any drainage waters from planted areas within the site that might carry silt or sediment, and nutrients, using cut off drains to control direct discharge into streams.

## 7.3.4 Potential Impacts

The potential impacts of the proposed afforestation and mitigation measures that will be put in place to eliminate or reduce them are set out below.

### 7.3.4.1 ‘Do-Nothing’ Scenario

The lands have been Technically Approved and will be afforested should the Curraglass Renewable Energy Development proceed or not.

### 7.3.4.2 Excavation of Forestry Drains and Planting

**Pathways:** Drainage and surface water discharge routes.

**Receptors:** Surface waters and associated dependent ecosystems.

**Potential Impacts:** Indirect, negative, slight, short term, medium probability impact.

Shallow forestry drains will be constructed using an excavator throughout the site to a similar drainage pattern as Figure 2-3. There are no surface water courses on or adjacent the site and so the drains will ultimately discharge to the existing offsite field drain networks.

Potential impacts during drain construction occur mainly from:

- Exposure of soil and subsoils due to excavation, vehicle tracking, and skidding resulting in a source of suspended sediment which can become entrained in surface water runoff and enter drains; and
- Nutrient release.

Mitigation measures and the overall residual impact is detailed in Section 7.3.4.4.1 and Section 7.3.4.4.2 below.

### 7.3.4.3 Harvesting Operations

**Pathways:** Drainage and surface water discharge routes.

**Receptors:** Surface waters and associated dependant ecosystems.

**Potential Impacts:** Indirect, negative, moderate, short term, medium probability impact.

Potential impacts during tree felling occur mainly from:

- Exposure of soil and subsoils due to vehicle tracking, and skidding or forwarding extraction methods resulting in a source of suspended sediment which can become entrained in surface water runoff;
- Release of sediment attached to timber in stacking areas; and,
- Nutrient release.

Mitigation measures and the overall residual impact is detailed in Section 7.3.4.4.1 and Section 7.3.4.4.2 below.

### 7.3.4.4 Site Access

Forestry felling can occur within 0.8-1km of access points (roads & tracks) to the main forest body. Due to the small size of this site, additional access tracks or roads will not be required. This site is located adjacent an existing road network with existing entrances which will not require upgrading or alteration.

#### 7.3.4.4.1 Proposed Mitigation Measures

Best practice methods related to water incorporated into the forestry management and mitigation measures have been derived from:

- Forestry Commission (2004): *Forests and Water Guidelines*, Fourth Edition. Publ. Forestry Commission, Edinburgh;
- Coillte (2009): *Forest Operations & Water Protection Guidelines*;
- Forest Service (Draft): *Forestry and Freshwater Pearl Mussel Requirements - Site Assessment and Mitigation Measures*;

- Forest Service (2000): *Forestry and Water Quality Guidelines*. Forest Service, DAF, Johnstown Castle Estate, Co. Wexford;
- Forest Service (2016) *Environmental Requirements for Afforestation*. Forest Service, DAF, Johnstown Castle Estate, Co. Wexford; and
- Forest Service (2016) *Land Types for Afforestation*. Forest Service, DAF, Johnstown Castle Estate, Co. Wexford.

Mitigation measures which will reduce the risk of entrainment of suspended solids and nutrient release in surface watercourses comprise best practice methods which will be applied at the replanting site. These include:

- Machine combinations will be chosen which are most suitable for ground conditions at the time of excavation and felling, and which will minimise surrounding soils disturbance;
- Where possible, existing drains will not be disturbed during drainage works;
- Drains and sediment traps will be installed during ground preparation and felling. Collector drains will be excavated at an acute angle to the contour (~0.3%-3% gradient), to minimise flow velocities. Main drains to take the discharge from collector drains will include water drops and rock armour, as required, where there are steep gradients, and should avoid being placed at right angles to the contour;
- Drains and silt traps will be maintained throughout all planting works, ensuring that they are clear of sediment build-up and are not severely eroded. Correct drain alignment, spacing and depth will ensure that erosion and sediment build-up are minimised and controlled.

### Buffer Zones

There is a requirement in the Forest Service Code of Practice and in the FSC Certification Standard for the installation of buffer zones adjacent to aquatic zones at planting stage. Minimum buffer zone widths recommended in the Forest Service (2000) guidance document “*Forestry and Water Quality Guidelines*” are shown in Table 7-2.

Table 7-2 Minimum Buffer Zone Widths (Forest Service, 2000)

Average slope leading to the aquatic zone		Buffer zone width on either side of the aquatic zone	Buffer zone width for highly erodible soils
Moderate	(0 - 15%)	10 m	15 m
Steep	(15 - 30%)	15 m	20 m
Very steep	(>30%)	20 m	25 m

#### 7.3.4.4.2 Residual Impact

Indirect, imperceptible, short term, low probability impact.

#### 7.3.4.5 Potential Release of Hydrocarbons during drainage works

**Pathway:** Groundwater flow paths and site drainage network.

**Receptor:** Groundwater and surface water.

**Potential Impact:** Indirect, negative, slight, temporary, medium probability impact to surface water quality.

Indirect, negative, slight, temporary, medium probability impact to local groundwater quality.

The replanting will be carried out by hand but it may be necessary to employ one excavator to create shallow drainage channels prior to planting. There is the potential for minor leaks from the excavator.

#### 7.3.4.5.1 **Proposed Mitigation Measures:**

Mitigation measures proposed to avoid release of hydrocarbons at the site are as follows:

- Maintenance will not be carried out on site.
- Fuels will not be stored on site.
- The plant used will be regularly inspected for leaks and fitness for purpose.

#### 7.3.4.5.2 **Residual Impact**

Indirect, negative, imperceptible, short term, low probability impact.

#### 7.3.4.6 **Potential Hydrological Impacts on Designated Sites**

The proposed afforestation site is located within the Upper Shannon Catchment. There will however be no direct discharges from the site and the hydrological regime locally will not be altered by the afforestation due to its small scale.

**Pathway:** Surface water flow paths.

**Receptor:** Down-gradient water quality & designated sites.

**Potential Impact:** Indirect, negative, imperceptible, short term, low probability impact.

#### 7.3.4.6.1 **Impact Assessment & Proposed Mitigation Measures**

The proposed mitigation measures which will include buffer zones and drainage control measures (i.e. cut off drains, tapered drains before buffer zones) will ensure that the quality of runoff from proposed development areas will be very high. The proposed development site is located in the Upper Shannon Catchment. There could potentially be an “imperceptible, short term, low probability impact” on local streams and rivers but this would be very localised and over a very short time period (i.e. hours).

Potential impacts on designated sites are also addressed in Section 5 of this document.

#### 7.3.4.6.2 **Residual Impact**

No residual impacts.

#### 7.3.4.7 **Significance of the Effects**

Based on the above, there will be no significant effects on hydrology and hydrogeology at this site.

### 7.4 **Replanting Area 2: Cloghaun More, Co. Clare**

#### 7.4.1 **Baseline Environment and Local Hydrology**

Ground level elevations range between approximately 87m and 52m AOD (meters above Ordnance Datum).

There are no streams or rivers within the site boundary, A drainage ditch flows along the western boundary of the site to the west of the R483. In addition, the Creegh river is located approximately 2 kilometres to the south of the site. The proposed afforestation site is located within the Mal Bay Hydrological Catchment

There are numerous manmade drains within the site and surrounds that are in place predominately to drain the surrounding lands for agricultural purposes and the neighbouring forestry plantations.

#### 7.4.1.1 Water Balance

While the process of afforestation may result in a slight alteration in the water runoff of the site, the small size of the site (0.172 km<sup>2</sup>) when compared with the Mal Bay Catchment (846 km<sup>2</sup>) means that any potential impacts this may have would be insignificant. The afforestation will lead to an imperceptible reduction in the runoff volumes in the longer term as the trees mature.

#### 7.4.1.2 Regional Hydrology

Under the Water Framework Directive (WFD), the site is located within the Mal Bay Catchment (Catchment ID28) and Annageeragh\_SC\_010 subcatchment (Sub catchment ID 28\_7). The Mal Bay Catchment comprises 7 sub catchments with 37 river water bodies, four lakes, four transitional and four coastal water bodies, and four groundwater bodies.

#### 7.4.1.3 Flood Risk Identification

OPW's river and coastal flood maps ([www.floodinfo.ie](http://www.floodinfo.ie)) and the Department of Housing, Planning and Local Government on-line planning mapping ([www.myplan.ie](http://www.myplan.ie)) were consulted to identify those areas as being at risk of flooding.

No records or risks associated with flooding were identified in the published data sets.

#### 7.4.1.4 Surface Water Hydrochemistry

Slightly acidic pH values of surface waters would be typical of peatland environments due to the decomposition of peat. In addition, the sandstone bedrock (and related till subsoils) which underlie the area would have slightly acidic groundwater characteristics which would have some effect on surface water chemistry specifically during dry periods when baseflow is likely to be more prevalent.

#### 7.4.1.5 Hydrogeology

According to the GSI [www.gsi.ie](http://www.gsi.ie), the site consists of Grey siltstone & sandstone which overlays the Gull Island Formation and sandstone, siltstone & mudstone which overlays the Central Clare Group (refer to Section 6 – Soils & Geology). The GSI has classified the bedrock formation here as a Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones.

#### 7.4.1.6 Groundwater Vulnerability

The GSI and EPA has assigned a groundwater vulnerability rating of 'Low' and 'Medium' to the majority of the site which is likely to be as a result of the presence of at least 10metres of low permeability till. Some small sections to the northeast of the site have been assigned a groundwater vulnerability rating of 'High' and 'Extreme'. Areas where bedrock is at or within 1 metre of the surface, an Extreme 'X' vulnerability rating is given.

#### 7.4.1.7 Surface Water Body Status

The EU Water Framework Directive aims to protect, enhance and restore all waters with aim to achieve at least good status by 2027.

The Water Framework Directive Status Report 2013 - 2018, published by the EPA has classified the Creegh River as having a 'Good' status and is not deemed to be at risk.

#### 7.4.1.8 Groundwater Body Status

The EPA has classified the groundwater within the aquifer underlying the site as being of 'Good' status and 'Not at Risk'.

#### 7.4.1.9 Designated Sites and Habitats

Designated sites include National Heritage Areas (NHAs), Proposed National Heritage Areas (pNHAs) Special Areas of Conservation (SACs), candidate Special Areas of Conservation (cSAC) and Special Protection Areas (SPAs). The proposed forestry development site is not located within any designated conservation-site. Designated sites in proximity to the proposed development site are described in Section 5, Flora and Fauna.

#### 7.4.1.10 Water Resources

There are no verified or unverified borehole wells located within 100 metres of the replanting lands, according to www.gsi.ie.

#### 7.4.1.11 Receptor Sensitivity

Due to the nature of afforestation, being near surface construction activities, impacts on groundwater are generally negligible and surface water is generally the main sensitive receptor assessed during impact assessments. The primary risk to groundwater at the site would be from nutrients associated with fertilisers.

Based on criteria set out in Table 7 1 groundwater at the site can be classed as ‘Sensitive’ to pollution given the bedrock is classified as a locally important Aquifer. However, the majority of the site is covered in shale and sandstones till and peat which acts as a protective cover to the underlying aquifer. Any contaminants which may be accidentally released on-site are more likely to travel to nearby streams within surface runoff.

Surface waters such as the Creegh river are sensitive to potential contamination. Surface water mitigation and controls are outlined in Section 7.4.4 below to ensure the protection of all downstream receiving waters. Mitigation measures will ensure that surface runoff from the afforested areas of the site will be of a high quality and will therefore not impact on the quality of downstream surface water bodies.

#### 7.4.2 Proposed Site Drainage

The site will be drained in accordance with the Forestry Guidelines. Forestry plantations are generally drained by a network of mound drains which typically run perpendicular to the topographic contours of the site and feed into collector drains, which discharge to interceptor drains down-gradient of the plantation.

Mound drains are generally spaced approximately every 15m. As illustrated in Figure 2-3, Interceptor drains are generally located up-gradient (cut-off drains) and down-gradient of forestry plantations. A schematic of a typical standard forestry drainage network and one which is representative of the proposed site drainage network is shown above as Figure 2-3.

#### 7.4.3 Proposed Drainage Management

Runoff control and drainage management are key elements in terms of mitigation against impacts on surface water bodies. Two distinct methods will be employed to manage drainage water within the proposed development. The first method involves ‘keeping clean water clean’ by avoiding disturbance to natural drainage features. The second method involves collecting any drainage waters from planted areas within the site that might carry silt or sediment, and nutrients, using cut off drains to control direct discharge into streams.

#### 7.4.4 Potential Impacts

The potential impacts of the proposed afforestation and mitigation measures that will be put in place to eliminate or reduce them are set out below.

#### 7.4.4.1 'Do-Nothing' Scenario

The lands have been Technically Approved and will be afforested should the Curraglass Renewable Energy Development proceed or not.

#### 7.4.4.2 Excavation of Forestry Drains and Planting

**Pathways:** Drainage and surface water discharge routes.

**Receptors:** Surface waters and associated dependent ecosystems.

**Potential Impacts:** Indirect, negative, slight, short term, medium probability impact.

Shallow forestry drains will be constructed using an excavator throughout the site to a similar drainage pattern as Figure 2-3. There are no surface watercourses on the site and so the drains will ultimately discharge to the existing offsite field drain networks.

Potential impacts during drain construction occur mainly from:

- Exposure of soil and subsoils due to excavation, vehicle tracking, and skidding resulting in a source of suspended sediment which can become entrained in surface water runoff and enter drains; and
- Nutrient release.

Mitigation measures and the overall residual impact is detailed in Section 7.4.4.4.1 and Section 7.4.4.4.2 below.

#### 7.4.4.3 Harvesting Operations

**Pathways:** Drainage and surface water discharge routes.

**Receptors:** Surface waters and associated dependant ecosystems.

**Potential Impacts:** Indirect, negative, moderate, short term, medium probability impact.

Potential impacts during tree felling occur mainly from:

- Exposure of soil and subsoils due to vehicle tracking, and skidding or forwarding extraction methods resulting in a source of suspended sediment which can become entrained in surface water runoff;
- Release of sediment attached to timber in stacking areas; and,
- Nutrient release.

Mitigation measures and the overall residual impact is detailed in Section 7.4.4.4.1 and Section 7.4.4.4.2 below.

#### 7.4.4.4 Site Access

Forestry felling can occur within 0.8-1km of access points (roads & tracks) to the main forest body. Due to the small size of this site, additional access tracks or roads will not be required. This site is located adjacent an existing road network with existing entrances which will not require upgrading or alteration.

##### 7.4.4.4.1 Proposed Mitigation Measures

Best practice methods related to water incorporated into the forestry management and mitigation measures have been derived from:

- Forestry Commission (2004): *Forests and Water Guidelines*, Fourth Edition. Publ. Forestry Commission, Edinburgh;
- Coillte (2009): *Forest Operations & Water Protection Guidelines*;
- Forest Service (Draft): *Forestry and Freshwater Pearl Mussel Requirements – Site Assessment and Mitigation Measures*;
- Forest Service (2000): *Forestry and Water Quality Guidelines*. Forest Service, DAF, Johnstown Castle Estate, Co. Wexford;
- Forest Service (2016) *Environmental Requirements for Afforestation*. Forest Service, DAF, Johnstown Castle Estate, Co. Wexford; and
- Forest Service (2016) *Land Types for Afforestation*. Forest Service, DAF, Johnstown Castle Estate, Co. Wexford.

Mitigation measures which will reduce the risk of entrainment of suspended solids and nutrient release in surface watercourses comprise best practice methods which will be applied at the replanting site. These include:

- Machine combinations will be chosen which are most suitable for ground conditions at the time of excavation and felling, and which will minimise surrounding soils disturbance;
- Where possible, existing drains will not be disturbed during drainage works;
- Drains and sediment traps will be installed during ground preparation and felling. Collector drains will be excavated at an acute angle to the contour (~0.3%-3% gradient), to minimise flow velocities. Main drains to take the discharge from collector drains will include water drops and rock armour, as required, where there are steep gradients, and should avoid being placed at right angles to the contour;
- Drains and silt traps will be maintained throughout all planting works, ensuring that they are clear of sediment build-up and are not severely eroded. Correct drain alignment, spacing and depth will ensure that erosion and sediment build-up are minimised and controlled.

#### 7.4.4.4.2 Buffer Zones

There is a requirement in the Forest Service Code of Practice and in the FSC Certification Standard for the installation of buffer zones adjacent to aquatic zones at planting stage. Minimum buffer zone widths recommended in the Forest Service (2000) guidance document “*Forestry and Water Quality Guidelines*” are shown in Table 7-2.

#### 7.4.4.4.3 Residual Impact

Indirect, imperceptible, short term, low probability impact.

#### 7.4.4.5 Potential Release of Hydrocarbons during drainage works

**Pathway:** Groundwater flow paths and site drainage network.

**Receptor:** Groundwater and surface water.

**Potential Impact:** Indirect, negative, slight, temporary, medium probability impact to surface water quality.

Indirect, negative, slight, temporary, medium probability impact to local groundwater quality.

The replanting will be carried out by hand but it may be necessary to employ one excavator to create shallow drainage channels prior to planting. There is the potential for minor leaks from the excavator.

##### 7.4.4.5.1 Proposed Mitigation Measures:

Mitigation measures proposed to avoid release of hydrocarbons at the site are as follows:

- Maintenance will not be carried out on site.

- > Fuels will not be stored on site.
- > The plant used will be regularly inspected for leaks and fitness for purpose.

#### 7.4.4.5.2 **Residual Impact**

Indirect, negative, imperceptible, short term, low probability impact.

#### 7.4.4.6 **Potential Hydrological Impacts on Designated Sites**

The proposed afforestation site is located within the Mal Bay Catchment. There will however be no direct discharges from the site and the hydrological regime locally will not be altered by the afforestation due to its small scale.

**Pathway:** Surface water flow paths.

**Receptor:** Down-gradient water quality & designated sites.

**Potential Impact:** Indirect, negative, imperceptible, short term, low probability impact.

#### 7.4.4.6.1 **Impact Assessment & Proposed Mitigation Measures**

The proposed mitigation measures which will include buffer zones and drainage control measures (i.e. cut off drains, tapered drains before buffer zones) will ensure that the quality of runoff from proposed development areas will be very high. The proposed development site is located in the Mal Bay Catchment. There could potentially be an “imperceptible, short term, low probability impact” on local streams and rivers but this would be very localised and over a very short time period (i.e. hours).

Potential impacts on designated sites are also addressed in Section 5 of this document.

#### 7.4.4.6.2 **Residual Impact**

No residual impacts.

#### 7.4.4.7 **Significance of the Effects**

Based on the above, there will be no significant effects on hydrology and hydrogeology at this site.

## 8. LANDSCAPE AND VISUAL

### 8.1 Introduction

This section of the report addresses the landscape and visual impacts of the proposed replanting areas at Sheehaun, Co. Roscommon and Cloghaun More, Co. Clare. It includes a description of the relevant County Council landscape policy for each site and describes the sites' landscape values and sensitivity. The landscape of each area is described in terms of its character, which includes a description of landform and landcover. An impact assessment of the proposed replanting is then undertaken. Documents consulted include:

- *'Landscape and Landscape Assessment: Consultation Draft of Guidelines for Planning Authorities'* (Department of the Environment and Local Government 2000).
- *'Guidelines for Landscape and Visual Impact Assessment'* (The Landscape Institute/Institute of Environmental Management & Assessment, 2013).
- *'Forestry and the Landscape Guidelines'* (Forest Service, 2000).

#### 8.1.1 Baseline Landscape Assessment Methodology

In order to carry out this assessment, a desk study was undertaken which identified relevant policies and guidelines, both at national and local level. This includes policies on forestry, landscape and landscape character, designated landscapes, and scenic routes. Maps and aerial images of the proposed replanting site were also studied.

## 8.2 Replanting Area 1: Sheehaun, Co. Roscommon

### 8.2.1 Landscape Policy Context

This section of the report refers to policies of the Roscommon Development Plan 2014 - 2020 (As Varied), as well as to the Forest Service Landscape Guidelines.

#### 8.2.1.1 Roscommon County Development Plan 2014 – 2020 (As Varied)

##### 8.2.1.1.1 Landscape Character Areas

The Sheehaun site is located within both LCA 5: Slieve Bawn and Feorish Bogland Basin. Slieve Bawn forms the western edge from where the landform gently slopes eastward draining into low lying bogland where it meets the eastern boundary defined by the meandering Shannon. The mountain is one of the highest ridges in the county, peaking at 262m ASL and creates strong visual separation between the Shannon River and the remainder of the county in this area. Higher ground is predominantly covered in wet grassland with extensive areas of coniferous plantation as well as transitional woodland scrub. The lower region, occupying most of this landscape character area, is made up of cutover raised bog, most of which has been commercially harvested. Elevated views from Slieve Bawn to the east are of a highly mechanised landscape of commercial peatland and the peat burning electricity plant in the distance at Lanesborough.

Much of the land in the area remains sparsely populated and isolated, although there is a broad network of roads leading into the cutover bog. The main settlement in the area is the village of Lanesborough.

The principles for landscape management include careful consideration of the siting and planting regime of new forestry plantations, in small scale irregular plantations with a good proportion of deciduous trees and recommend irregular edges which follow the landform and a varied age structure.

### 8.2.1.1.2 **Landscape Values**

The landscape values classify each of the landscape character areas into one of the following four classes:

- > Exceptional Value
- > Very High Value
- > High Value
- > Moderate Value.

The Shannon System running along the eastern boundary of the county has been classified as of Very High Value. The Shannon System is of high aesthetic and ecological quality and the other upland areas provide important scenic amenities. LCA 5 which the replanting site is located in, is adjacent to the River Shannon and therefore is classified as Very High Value.

### 8.2.1.1.3 **Scenic Routes**

A draft map of Scenic Routes and Scenic Views is presented in Appendix 1 of the Landscape Character Assessment of Roscommon and includes all routes within the county which are designated as Scenic Routes. The proposed replanting site at Sheehaun is not located along or adjacent to a scenic route. The nearest scenic route to the proposed site is the R7, which is approximately 2.5 kms south of the site. The R7: Scenic route runs along the N63 with views to south overlooking Lough Ree.

## 8.2.2 **Guidelines**

The Forest Service have produced the *'Forestry and the Landscape Guidelines'* (Forest Service, 2000) which provide recommendations on forest planning and design which aim to ensure that the proposed forest is sympathetic to the landscape character of the location. The Guidelines identify scenarios for four main types of landscape character:

- > Rolling Moorland
- > Rolling Fertile Farmland
- > Drumlins
- > Mountain and Farmland complex

The replanting site at Sheehaun is best described as 'Rolling Fertile Farmland'. This Guidelines describe this landscape type as follows:

*"This landscape type is a man-made 'working landscape'. The rolling hills are characterised by a patchwork of clearly defined fields with farmsteads and houses scattered throughout. These fields are typically under pasture or tillage. The scale of the landscape is usually relatively enclosed. Soil fertility should allow broadleaf plantations, with a potential for silvicultural systems other than clearfelling."*

For this landscape character type, the Guidelines recommend certain approaches to the planning and design of the plantation. Forest planning considerations include size, arrangement, location, and for this landscape type, small to medium forests, and coverage which is dispersed as opposed to extensive are recommended. The proposed replanting site is of similar scale to existing forestry plantations to the north and north west of the site and is not extensive. Forest design considerations include shape, pattern, proportion, edge, margin, colour and texture. Hedgerows are to be retained where possible.

The proposed replanting site has been granted Technical Approval for afforestation. The Technical Approval document includes as a condition that all guidelines (which includes the Forest Service landscape guidelines) will apply to afforestation at the site. The Guidelines advocate planting separate adjacent forests on this landscape type to create larger areas of cover, which is what the proposed replanting will achieve in conjunction with the adjacent plantations. In addition, the document specifies the approved species to be planted on the site.

Landscape Recommendations for Forest Harvesting: For this landscape type, the Guidelines recommend:

*“Clearfelling in farmland and drumlins is typically not as sensitive as it is on moorland. The sense of landscape utility through farming activities lends an ethos of human process and change, thus increasing acceptability.”*

### 8.2.3 Baseline Landscape

#### 8.2.3.1 Landscape character

The topography, vegetation and anthropological features on the land surface in an area combine to set limits on the amount of the landscape that can be seen at any one time. These physical restrictions form individual areas or units, known as physical units, whose character can be defined by aspect, slope, scale and size. A physical unit is generally delineated by topographical boundaries and is defined by landform and landcover.

The proposed replanting site at Sheehaun is located adjacent to a local road. Coniferous forestry is located to the north and northwest of the site, which is a feature of the wider landscape. The land to the north, south and west is bordered by agricultural grassland. Field boundaries are evident. The site lies at between at 43m and 50m AOD.

The proposed replanting area is located within the Upper Shannon Catchment. There are no streams or rivers within the site or adjacent the site boundary. The closest watercourse to the site is the Gortgallan Stream runs along the northern border the site. The landcover of the site is composed primarily of grassland.

#### 8.2.3.2 Landscape Sensitivity

The sensitivity of a landscape to development and therefore to change varies according to its character and to the importance that is attached to any combination of landscape values. The sensitivity of a landscape is derived from consideration of designations such as Special Protection Areas (SPAs), Special Areas of Conservation (SACs), Natural Heritage Areas (NHAs) and National Parks, from information such as tourist maps, guidebooks and brochures, and from the evaluation of indicators such as uniqueness, popularity, distinctiveness, and quality of the elements of the area.

A desktop assessment of landscape sensitivity in the vicinity of the proposed replanting site was carried out. The methodology for this assessment was based on that set out in the Department of the Environment and Local Government (DoEHLG) guidance document *Landscape and Landscape Assessment – Consultation Draft of Guidelines for Planning Authorities* (2000). This document recommends an assessment of landscape sensitivity based on an evaluation of individual features, such as the quality, integrity, etc. The results of the assessment are presented in Table 8-1.

Table 8-1 Sheehaun Landscape Sensitivity

Feature	Description
Quality	The quality of the landscape of the proposed site and its immediate environs can be described as modified.
Integrity	The current development site has been modified by the interaction of man with the environment, primarily in the form of agriculture, peat cutting and forestry.
Distinctiveness	There is no particular feature of distinctiveness on the site.
Popularity	A sense of popularity is created where landscape features are widely recognised or appreciated. There are no such features on this site.
Rarity	The proposed replanting site is not considered to represent a rare or unique landscape type, at a local or regional scale. The site is not

Feature	Description
	located within a designated ecological area. The closest Natura 2000 site, i.e. Special Area of Conservation (SAC) or Special Protection Area (SPA), is the Corbo Bog SAC, located approximately 2.4 kilometres south/southwest of the subject site, at its nearest point.
Cultural Meaning	A sense of cultural meaning arises where a site or features within a site are deemed to explain, represent or inspire cultural values. There are no recorded archaeological sites or monuments located within site, and no significant sense of cultural meaning attributed to the site. The nearest recorded features is an earthwork (RO036-017), located approximately 500 metres west of the site.
Sense of Public Ownership & Social Importance	A sense of public ownership arises due to ease of accessibility, visibility or a widely shared meaning. This is privately owned land and there is no sense of public ownership.

Following the assessment presented in Table 8.1, The proposed replanting site is considered to be of low landscape sensitivity.

### 8.2.3.3 Landscape Context and Site Visibility

Open views from the local roads adjacent to the site are intermittent. Views of coniferous forestry are a feature of the wider area. Views from the site are dominated by the surrounding agricultural lands, peat cutting and coniferous plantations.

## 8.2.4 Impact Assessment

### 8.2.4.1 'Do-Nothing' Scenario

In the 'Do Nothing' scenario, the subject site would be afforested in any case, as per Technical Approval that has been issued for the site.

### 8.2.4.2 Site Preparation and Planting Phase

#### 8.2.4.2.1 Impacts on Landscape Character –Temporary Imperceptible Neutral Impact

The planting of forestry will entail site works in terms of woody weed clearance and construction of forestry drains and will use the angle notch planting method described in Section 2.3.2 above. These activities will have a temporary neutral impact on the landscape character, which is that of a rural working landscape with a mixture of agricultural and forestry land uses. A neutral impact is a change which does not affect the quality of the environment (EPA, 2017). The site clearance and replanting activities will assimilate well into the receiving environment, and are therefore classed as an imperceptible impact, i.e. an impact capable of measurement but without noticeable consequences.

#### 8.2.4.2.2 Impacts on Visual Amenity - Temporary Imperceptible Neutral Impact

The proposed replanting is to be carried out in an area of agricultural grassland where the surrounding lands already have existing conifer plantations, and therefore the proposed replanting is not introducing a new land use but conforming to an established one. The predicted visual impact of the proposed replanting is therefore a Long Term, Imperceptible Neutral Impact.

### 8.2.4.3 **Operational Phase**

#### 8.2.4.3.1 **Impacts on Landscape Character – Long Term Imperceptible Neutral Impact**

The proposed replanting is to be carried out in an area where there are already existing conifer plantations among agricultural fields, and therefore the proposed replanting is contributing to the patchwork of forestry plantations. The predicted impact of the proposed replanting on landscape character is a Long Term, Imperceptible Neutral Impact.

#### 8.2.4.3.2 **Impacts on Visual Amenity - Long Term Imperceptible Neutral Impact**

The proposed replanting is to be carried out in an area where there are already existing conifer plantations among agricultural fields, and therefore the proposed replanting is not introducing a new land use, but conforming to an established one and contributing to the patchwork of forestry plantations within open land. Felling will be carried out in accordance with the Forestry and the Landscape Guidelines. The predicted long-term visual impact of the proposed replanting is therefore a Long Term, Imperceptible Neutral Impact.

### 8.2.5 **Proposed Mitigation Measures**

#### 8.2.5.1 **Site Preparation and Planting Phase**

Mitigation measures for the construction of the drainage and planting methods have been included in the Technical Approval document. The planting method will be as per Section 2.3.2 above and mound drains will be constructed. The proposed replanting will be carried out in line with the recommendations of the Forestry and the Landscape Guidelines.

### 8.2.6 **Residual Impacts**

Following mitigation, the Residual Impact on both Landscape Character and Visual Amenity will be a Long Term Imperceptible Neutral Impact.

### 8.2.7 **Cumulative Impacts**

Cumulative impacts are described as additional changes to the landscape or visual amenity caused by the proposed development in conjunction with other developments or actions that occurred in the past, present or are likely to occur in the foreseeable future. The cumulative impact assessment is based on the Planning History search carried out and described in Section 2 and the existing land-uses. There is coniferous forestry located to the north and northwest of the site, and the cumulative impact arising from the proposed replanting in conjunction with the existing forestry plantations and future development is assessed as Long Term, Imperceptible Neutral Impact.

## 8.3 Replanting Area 2: Cloghaun More, Co. Clare

### 8.3.1 Landscape Policy Context

#### 8.3.1.1 Clare County Development Plan 2017-2023

This section of the report refers to the Clare County Development Plan 2017 – 2023 and the Landscape Character Assessment of County Clare, as well as to the Environmental Requirements for Afforestation document.

##### 8.3.1.1.1 *Landscape Character Areas*

The Cloghaun More site is located within both LCA 19: Kilmihil Farmland and LCA 20: Malbay Coastal Farmland. LCA 19 is described as having undulating to rolling hills with medium-high elevation and scatter settlement across the area. LCA 20 is described as being gently undulating pastoral farmland with indented coastline and wide sandy bays. There is scattered but frequent settlement.

The principles for landscape management include careful consideration of siting and planting regime of new forestry plantations, in small scale irregular plantations with a good proportion of deciduous trees and recommend irregular edges which follow the landform and a varied age structure.

##### 8.3.1.1.2 *Heritage Landscapes*

The Clare County Development Plan has identified Areas of Heritage Landscapes. Heritage Landscapes are those areas within the County where sensitive environmental resources – scenic, ecological and historic, are located. Heritage Landscapes are envisioned as the most valued parts of the County – that are important to the people of County Clare as well as the wider community – both nationally and internationally. There are 4 Heritage Landscapes described which are Lough Derg and the Eastern Uplands, The Burren, The Coast and The Fergus / Shannon Estuary

The closest Heritage Landscape to the proposed development site is ‘The Coast’ which is approximately 2 kilometres to the northwest of the site.

##### 8.3.1.1.3 *Scenic Routes*

Section 13.5 of the County Development Plan addresses Scenic Routes. Objective CDP 13.7 of the Plan states it is an objective of Clare County Council:

- To protect sensitive areas from inappropriate development while providing for development and change that will benefit the rural community;
- To ensure that proposed developments take into consideration their effects on views from the public road towards scenic features or areas and are designed and located to minimise their impact;
- To ensure that appropriate standards of location, siting, design, finishing and landscaping are achieved.

Appendix 5 of the County Development Plan lists all routes within the county which are designated as Scenic Routes. The proposed replanting site at Cloghaun More is not located along or adjacent to a scenic route.

### 8.3.2 Forestry and the Landscape Guidelines

The ‘Forest Service *Forestry and the Landscape Guidelines*’ (Forest Service, 2000) provides recommendations on forest planning and design which aim to ensure that the proposed forest is sympathetic to the landscape character of the location. It is described in Section 8.2.2 above.

The replanting site at Cloghaun More is best described as ‘Rolling Fertile Farmland’. This Guidelines describe this landscape type as follows:

*“This landscape type is a man-made ‘working landscape’. The rolling hills are characterised by a patchwork of clearly defined fields with farmsteads and houses scattered throughout. These fields are typically under pasture or tillage. The scale of the landscape is usually relatively enclosed. Soil fertility should allow broadleaf plantations, with a potential for silvicultural systems other than clearfelling.”*

For this landscape character type, the Guidelines recommend certain approaches to the planning and design of the plantation. Forest planning considerations include size, arrangement, location, and for this landscape type, small to medium forests, and coverage which is dispersed as opposed to extensive are recommended. The proposed replanting site is of similar scale to existing forestry plantations in the vicinity and is not extensive. Forest design considerations include shape, pattern, proportion, edge, margin, colour and texture. Hedgerows are to be retained where possible.

The Cloghaun More site has been granted Technical Approval for afforestation. The Technical Approval document for each site includes as a condition that all Forest Service guidelines will apply to afforestation at these locations. In addition, the document specifies the approved species to be planted on the sites.

### 8.3.3 Baseline Landscape

#### 8.3.3.1 Landscape character

The topography, vegetation and anthropological features on the land surface in an area combine to set limits on the amount of the landscape that can be seen at any one time. These physical restrictions form individual areas or units, known as physical units, whose character can be defined by aspect, slope, scale and size. A physical unit is generally delineated by topographical boundaries and is defined by landform and landcover.

The proposed replanting site occupies 17.22 hectares with elevations ranging from 37m and 52m AOD. The landcover of the site is primarily composed of agricultural grassland. Line of trees are located within the southern area of the site. Forestry is located to the southeast of the site and field boundaries are evident. The landcover of the surrounding fields consists of agricultural grassland, peat land and forestry to the west of the site.

The proposed replanting area is located within the Mal Bay Catchment. There are no streams or rivers within the site boundary, however a drainage ditch flows along the western boundary of the site to the west of the R483 and the Creagh river is located approximately 2 kilometres to the south of the site.

#### 8.3.3.2 Landscape Sensitivity

The sensitivity of a landscape to development and therefore to change varies according to its character and to the importance that is attached to any combination of landscape values. The sensitivity of a landscape is derived from consideration of designations such as Special Protection Areas (SPAs), Special Areas of Conservation (SACs), Natural Heritage Areas (NHAs) and National Parks, from information such as tourist maps, guidebooks and brochures, and from the evaluation of indicators such as uniqueness, popularity, distinctiveness, and quality of the elements of the area.

A desktop assessment of landscape sensitivity in the vicinity of the proposed replanting site was carried out. The methodology for this assessment was based on that set out in the Department of the Environment and Local Government (DoEHLG) guidance document ‘*Landscape and Landscape Assessment – Consultation Draft of Guidelines for Planning Authorities*’ (2000). This document recommends an assessment of landscape sensitivity based on an evaluation of individual features, such as the quality, integrity, etc. The results of the assessment are presented in Table 8-2.

Table 8-2 Cloghaun More Landscape Sensitivity

Feature	Description
Quality	The quality of the landscape of the proposed site and its immediate environs can be described as modified.
Integrity	The current development site has been modified by the interaction of man with the environment, primarily in the form of agriculture, peat extraction and forestry.
Distinctiveness	There is no particular feature of distinctiveness on the site.
Popularity	A sense of popularity is created where landscape features are widely recognised or appreciated. There are no such features on this site.
Rarity	The proposed replanting site is not considered to represent a rare or unique landscape type, at a local or regional scale. The site is not located within a designated ecological area. The closest Natura 2000 site, i.e. Special Area of Conservation (SAC) or Special Protection Area (SPA), is the Mid Clare Coast SPA, located approximately 2.8 kilometres west of the subject site.
Cultural Meaning	A sense of cultural meaning arises where a site or features within a site are deemed to explain, represent or inspire cultural values. There are no recorded archaeological features on the study site. The nearest recorded feature is a Ringfort (CL038-051), located approximately 100 metres east of the site.
Sense of Public Ownership & Social Importance	A sense of public ownership arises due to ease of accessibility, visibility or a widely shared meaning. This is privately owned land and there is no sense of public ownership.

Following the assessment presented in Table 8-2, the proposed replanting site is considered to be of low landscape sensitivity.

### 8.3.3.3 Landscape Context and Site Visibility

Views from the site are dominated by the surrounding coniferous plantations and agricultural lands.

### 8.3.4 Impact Assessment

#### 8.3.4.1 'Do-Nothing' Scenario

In the 'Do Nothing' scenario, the subject site would be afforested in any case, as per Technical Approval that has been issued for the site.

#### 8.3.4.2 Site Preparation and Planting Phase

##### 8.3.4.2.1 Impacts on Landscape Character –Temporary Imperceptible Neutral Impact

The planting of forestry will entail site works in terms of woody weed clearance and construction of forestry drains and will use the angle notch planting method described in Section 2.3.2 above. These activities will have a temporary neutral impact on the landscape character, which is that of a rural working landscape with a mixture of agricultural and forestry land uses. A neutral impact is a change which does not affect the quality of the environment (EPA, 2017). The site clearance and replanting activities will

assimilate well into the receiving environment, and are therefore classed as an imperceptible impact, i.e. an impact capable of measurement but without noticeable consequences.

#### 8.3.4.2.2 **Impacts on Visual Amenity - Temporary Imperceptible Neutral Impact**

The proposed replanting is to be carried out in an area of agricultural grassland where the surrounding lands already have existing conifer plantations, and therefore the proposed replanting is not introducing a new land use but conforming to an established one. The predicted visual impact of the proposed replanting is therefore a Long Term, Imperceptible Neutral Impact.

#### 8.3.4.3 **Operational Phase**

##### 8.3.4.3.1 **Impacts on Landscape Character – Long Term Imperceptible Neutral Impact**

The proposed replanting is to be carried out in an area where there are already existing conifer plantations, and therefore the proposed replanting is contributing to the patchwork of forestry plantations. The predicted impact of the proposed replanting on landscape character is a Long Term, Imperceptible Neutral Impact.

##### 8.3.4.3.2 **Impacts on Visual Amenity - Long Term Imperceptible Neutral Impact**

The proposed replanting is to be carried out in an area where there are already existing conifer plantations among agricultural fields and peat land, and therefore the proposed replanting is not introducing a new land use, but conforming to an established one and contributing to the patchwork of forestry plantations within open land. Felling will be carried out in accordance with the Forestry and the Landscape Guidelines. The predicted long-term visual impact of the proposed replanting is therefore a Long Term, Imperceptible Neutral Impact.

#### 8.3.5 **Proposed Mitigation Measures**

##### 8.3.5.1 **Site Preparation and Planting Phase**

Mitigation measures for the construction of the drainage and planting methods have been included in the Technical Approval document. The planting method will be as per Section 2.3.2 above and mound drains will be constructed. The proposed replanting will be carried out in line with the recommendations of the Forestry and the Landscape Guidelines.

#### 8.3.6 **Residual Impacts**

Following mitigation, the Residual Impact on both Landscape Character and Visual Amenity will be a Long Term Imperceptible Neutral Impact.

#### 8.3.7 **Cumulative Impacts**

Cumulative impacts are described as additional changes to the landscape or visual amenity caused by the proposed development in conjunction with other developments or actions that occurred in the past, present, or are likely to occur in the foreseeable future. The cumulative impact assessment is based on the Planning History search carried out and described in Section 2 and the existing land-uses. There is coniferous forestry located to the west, east, southeast and northeast of the site, and the cumulative impact arising from the proposed replanting in conjunction with the existing forestry plantations and future development is assessed as Long Term, Imperceptible Neutral Impact.

## 9. ARCHAEOLOGY AND CULTURAL HERITAGE

### 9.1 Introduction

This section presents the results of an archaeological and cultural heritage impact assessment for the proposed afforestation of the replanting areas.

The purpose of this section is to assess the potential impacts of the afforestation on the surrounding archaeological, architectural and cultural heritage landscape. An assessment of potential impacts is presented and a number of mitigation measures are recommended where appropriate.

### 9.2 Methodology

A desk-based study of the proposed replanting areas was undertaken in order to assess the archaeological, architectural and cultural heritage potential of the area and to identify constraints or features of archaeological/cultural heritage significance within or adjacent to the sites. Each of the proposed sites have been Technically Approved for afforestation which will be completed in accordance with the *'Forestry and Archaeology Guidelines' (2000) (the Guidelines)*. The guidelines provide specific mitigation measures to be employed for afforestation which will minimise potential impacts on this resource.

#### 9.2.1 Statutory Context

##### 9.2.1.1 Current Legislation

Archaeological monuments are safeguarded through national and international policy, which is designed to secure the protection of the cultural heritage resource. This is undertaken in accordance with the provisions of the European Convention on the Protection of the Archaeological Heritage (Valletta Convention). This was ratified by Ireland in 1997.

Both the National Monuments Acts 1930 to 2004 and relevant provisions of the Cultural Institutions Act 1997 are the primary means of ensuring protection of archaeological monuments, the latter of which includes all man-made structures of whatever form or date. There are a number of provisions under the National Monuments Acts which ensure protection of the archaeological resource. These include the Register of Historic Monuments (1997 Act) which means that any interference to a monument is illegal under that Act. All registered monuments are included on the Record of Monuments and Places (RMP).

The Record of Monuments and Places (RMP) was established under Section 12 (1) of the National Monuments (Amendment) Act 1994 and consists of a list of known archaeological monuments and accompanying maps. The Record of Monuments and Places affords some protection to the monuments entered therein. Section 12 (3) of the 1994 Amendment Act states that any person proposing to carry out work at or in relation to a recorded monument must give notice in writing to the Minister (Environment, Heritage and Local Government) and shall not commence the work for a period of two months after having given the notice. All proposed works, therefore, within or around any archaeological monument are subject to statutory protection and legislation (National Monuments Acts 1930-2004).

Under the Heritage Act (1995) architectural heritage is defined to include *'all structures, buildings, traditional and designed, and groups of buildings including street-scapes and urban vistas, which are of historical, archaeological, artistic, engineering, scientific, social or technical interest, together with their setting, attendant grounds, fixtures, fittings and contents...'*. A heritage building is also defined to include *'any building, or part thereof, which is of significance because of its intrinsic architectural or artistic quality or its setting or because of its association with the commercial, cultural, economic, industrial, military, political, social or religious history of the place where it is situated or of the country or generally'*.

### 9.2.1.2 Granada Convention

The Council of Europe, in Article 2 of the 1985 Convention for the Protection of the Architectural Heritage of Europe (Granada Convention), states that *for the purpose of precise identification of the monuments, groups of structures and sites to be protected, each member State will undertake to maintain inventories of that architectural heritage*. The Granada Convention emphasises the importance of inventories in underpinning conservation policies.

The National Inventory of Architectural Heritage (NIAH) was established in 1990 to fulfil Ireland's obligations under the Granada Convention, through the establishment and maintenance of a central record, documenting and evaluating the architectural heritage of Ireland. Article 1 of the Granada Convention establishes the parameters of this work by defining 'architectural heritage' under three broad categories of Monument, Groups of Buildings, and Sites:

- Monument: all buildings and structures of conspicuous historical, archaeological, artistic, scientific, social or technical interest, including their fixtures and fittings;
- Group of buildings: homogeneous groups of urban or rural buildings conspicuous for their historical, archaeological, artistic, scientific, social or technical interest, which are sufficiently coherent to form topographically definable units;
- Sites: the combined works of man and nature, being areas which are partially built upon and sufficiently distinctive and homogenous to be topographically definable, and are of conspicuous historical, archaeological, artistic, scientific, social or technical interest.

The Council of Europe's definition of architectural heritage allows for the inclusion of structures, groups of structures and sites which are considered to be of significance in their own right, or which are of significance in their local context and environment. The NIAH believes it is important to consider the architectural heritage as encompassing a wide variety of structures and sites as diverse as post boxes, grand country houses, mill complexes and vernacular farmhouses.

## 9.2.2 Desktop Assessment

A primary cartographic source and base-line data for the archaeological assessment was the consultation of the Sites and Monuments Record (SMR) and Record of Monuments and Places (RMP) through the electronic database of recorded monuments which may be accessed at [www.archaeology.ie](http://www.archaeology.ie). All known recorded archaeological monuments are indicated on 6-inch Ordnance Survey (OS) maps and are listed in this record.

The following sources were consulted for this assessment report:

- Electronic database of recorded monuments ([www.archaeology.ie](http://www.archaeology.ie)).
- Aerial photographs (copyright of Ordnance Survey Ireland (OSI.ie)).

### 9.2.2.1 Recorded Monuments and Places

The Sites and Monuments Record (SMR) and Record of Monuments and Places (RMP) is a record of all known recorded archaeological monuments. The SMR/RMP is not a complete record of all monuments as newly discovered sites may not appear in the list or accompanying maps. In conjunction with the consultation of the SMR and RMP, the electronic database of recorded monuments which may be accessed at [www.archaeology.ie](http://www.archaeology.ie) was consulted.

#### Aerial Photograph Analysis

Aerial photographs of the site were examined, and no previously unrecorded archaeological features could be seen. Sources included Bing, Google Maps and Ordnance Survey of Ireland.

### 9.2.3 Archaeology

Archaeological heritage is a non-renewable resource. The overall objective of this assessment of impacts of the proposed development is to ensure that where a potential impact has been identified, that it can be mitigated against to ensure that the archaeological heritage will be available for future generations. The potential impacts on the recorded archaeological heritage are assessed here.

Potential impact are assessed on the basis of the impact classification terminology outlined in Table 1.1 of the EIAR, with the significance of impacts being defined as either imperceptible, slight, moderate, significant or profound, or if no impact is predicted to occur, 'No Impact'.

### 9.2.4 Potential Impacts

Potential afforestation impacts include direct destruction of recorded and unrecorded sites and indirect impacts on archaeological potential of nearby sites.

## 9.3 Replanting Area 1: Sheehaun, Co. Roscommon

### 9.3.1 Existing Environment

The electronic database of recorded monuments ([www.archaeology.ie](http://www.archaeology.ie)) was used to compile a list of known sites which occur in the vicinity of the site. There are no recorded archaeological features on the study site.

The nearest recorded feature is an earthwork (RO036-017), located approximately 500 metres west of the site.

There are no structures listed in the NIAH located within or in the vicinity of the site.

### 9.3.2 Potential Impacts

#### 9.3.2.1 'Do-Nothing' Scenario

The lands have been Technically Approved and will be afforested should the Curraglass Renewable Energy Development proceed or not.

#### 9.3.2.2 Potential Direct Impacts on the Archaeological/Architectural Heritage

Direct Impact refers to a 'physical impact' on a monument. The afforestation will require some minor earthmoving activities such as drainage and the provision of access tracks. Harvesting will require tree felling.

There are no recorded monuments or structures on the site and therefore there will be no direct impacts.

#### 9.3.2.3 Potential Indirect Impacts on the Archaeological/ Architectural Heritage

Potential indirect impacts may arise where a monument or area of archaeological or architectural potential is situated in relatively close proximity to a proposed development but is not directly (physically) affected by the development. In such cases the impact on the setting of the monument or views to and from it are assessed.

There are no recorded monuments or structures in the vicinity of the site and therefore there will be no indirect impacts.

#### 9.3.2.4 Cumulative Impacts

There will be no cumulative impact associated with the afforestation of the site as there are no features close to the site. A planning history search of applications in the vicinity of the proposed replanting lands has also been carried out, as described in Section 3.2 of this report. There are no developments located in the vicinity of the site that would give rise to cumulative impacts, in conjunction with the proposed development, on features of cultural heritage significance.

#### 9.3.3 Significance of the Effects

Based on the above, there will be no significant effects, on cultural heritage or archaeology, associated with afforestation at this site.

### 9.4 Replanting Area 2: Cloghaun More, Co. Clare

#### 9.4.1 Existing Environment

The electronic database of recorded monuments ([www.archaeology.ie](http://www.archaeology.ie)) was used to compile a list of known sites which occur at and in the vicinity of the site. There are no recorded archaeological features on the study site.

The nearest recorded feature is a Ringfort (CL038-051), located approximately 100 metres east of the site.

There are no structures listed in the NIAH located within or in the vicinity of the site.

#### 9.4.2 Potential Impacts

##### 9.4.2.1 'Do-Nothing' Scenario

The lands have been Technically Approved and will be afforested should the Curraglass Renewable Energy Development proceed or not.

##### 9.4.2.2 Potential Direct Impacts on the Archaeological/Architectural Heritage

Direct Impact refers to a 'physical impact' on a monument. The afforestation will require some minor earthmoving activities such as drainage and the provision of access tracks. Harvesting will require tree felling.

There are no recorded monuments or structures on the site and therefore there will be no direct impacts.

##### 9.4.2.3 Potential Indirect Impacts on the Archaeological/ Architectural Heritage

Potential indirect impacts may arise where a monument or area of archaeological or architectural potential is situated in relatively close proximity to a proposed development but is not directly (physically) affected by the development. In such cases the impact on the setting of the monument or views to and from it are assessed.

There are no recorded monuments or structures in the vicinity of the site and therefore there will be no indirect impacts.

#### 9.4.2.4 **Cumulative Impacts**

There will be no cumulative impact associated with the afforestation of the site as there are no features close to the site. A planning history search of applications in the vicinity of the proposed replanting lands has also been carried out, as described in Section 3.2 of this report. There are no developments located in the vicinity of the site that would give rise to cumulative impacts, in conjunction with the proposed development, on features of cultural heritage significance.

#### 9.4.3 **Significance of the Effects**

Based on the above, there will be no significant effects, on cultural heritage or archaeology, associated with afforestation at this site.

## 10. AIR, CLIMATE AND NOISE

### 10.1 Air

#### 10.1.1 Background

The primary land-uses within and in the vicinity of the 2 no. site locations comprise agriculture, forestry and some peat extraction. Due to the non-industrial nature of afforestation and the general character of the surrounding environment, air quality sampling was deemed to be unnecessary for this study. It is expected that air quality in the existing environment is good, since there are no major sources of air pollution (e.g. heavy industry) in the vicinity of the sites.

The growth of forestry has no direct atmospheric emissions. Some minor indirect emissions associated with site preparation, planting and harvesting include vehicular and dust emissions.

#### 10.1.2 Air Quality Standards

In 1996, the Air Quality Framework Directive (96/62/EC) was published. This Directive was transposed into Irish law by the Environmental Protection Agency Act 1992 (Ambient Air Quality Assessment and Management) Regulations 1999. The Directive was followed by four Daughter Directives, which set out limit values for specific pollutants:

- The first Daughter Directive (1999/30/EC) deals with sulphur dioxide, oxides of nitrogen, particulate matter and lead.
- The second Daughter Directive (2000/69/EC) addresses carbon monoxide and benzene. The first two Daughter Directives were transposed into Irish law by the Air Quality Standards Regulations 2002 (SI No. 271 of 2002).
- A third Daughter Directive, Council Directive (2002/3/EC) relating to ozone was published in 2002 and was transposed into Irish law by the Ozone in Ambient Air Regulations 2004 (SI No. 53 of 2004).
- The fourth Daughter Directive, published in 2007, deals with polyaromatic hydrocarbons (PAHs), arsenic, nickel, cadmium and mercury in ambient air.

The Air Quality Framework Directive and the first three Daughter Directives have been replaced by the Clean Air for Europe (CAFE) Directive (Directive 2008/50/EC on ambient air quality), which encompasses the following elements:

- The merging of most of the existing legislation into a single Directive (except for the Fourth Daughter Directive) with no change to existing air quality objectives.
- New air quality objectives for PM<sub>2.5</sub> (fine particles) including the limit value and exposure concentration reduction target.
- The possibility to discount natural sources of pollution when assessing compliance against limit values.
- The possibility for time extensions of three years (for particulate matter PM<sub>10</sub>) or up to five years (nitrogen dioxide, benzene) for complying with limit values, based on conditions and the assessment by the European Commission.

Table 10-1 below sets out the limit values of the CAFE Directive, as derived from the Air Quality Framework Daughter Directives. Limit values are presented in micrograms per cubic metre ( $\mu\text{g}/\text{m}^3$ ) and parts per billion (ppb). The notation PM<sub>10</sub> is used to describe particulate matter or particles of ten micrometres or less in aerodynamic diameter. PM<sub>2.5</sub> represents particles measuring less than 2.5 micrometres in aerodynamic diameter.

Table 10-1 Limit values of Directive 2008/50/EC, 1999/30/EC and 2000/69/EC (Source: EPA)

Pollutant	Limit Value Objective	Averaging Period	Limit Value ( $\mu\text{g}/\text{m}^3$ )	Limit Value (ppb)	Basis of Application of Limit Value	Attainment Date
Sulphur dioxide ( $\text{SO}_2$ )	Protection of Human Health	1 hour	350	132	Not to be exceeded more than 24 times in a calendar year	1st Jan 2005
Sulphur dioxide ( $\text{SO}_2$ )	Protection of human health	24 hours	125	47	Not to be exceeded more than 3 times in a calendar year	1st Jan 2005
Sulphur dioxide ( $\text{SO}_2$ )	Protection of vegetation	Calendar year	20	7.5	Annual mean	19th Jul 2001
Sulphur dioxide ( $\text{SO}_2$ )	Protection of vegetation	1st Oct to 31st Mar	20	7.5	Winter mean	19th Jul 2001
Nitrogen dioxide ( $\text{NO}_2$ )	Protection of human health	1 hour	200	105	Not to be exceeded more than 18 times in a calendar year	1st Jan 2010
Nitrogen dioxide ( $\text{NO}_2$ )	Protection of human health	Calendar year	40	21	Annual mean	1st Jan 2010
Nitrogen monoxide (NO) and nitrogen dioxide ( $\text{NO}_2$ )	Protection of ecosystems	Calendar year	30	16	Annual mean	19th Jul 2001
Particulate matter 10 ( $\text{PM}_{10}$ )	Protection of human health	24 hours	50	-	Not to be exceeded more than 35 times in a calendar year	1st Jan 2005
Particulate matter 2.5 ( $\text{PM}_{2.5}$ )	Protection of human health	Calendar year	40	-	Annual mean	1st Jan 2005

Pollutant	Limit Value Objective	Averaging Period	Limit Value ( $\mu\text{g}/\text{m}^3$ )	Limit Value (ppb)	Basis of Application of Limit Value	Attainment Date
Particulate matter 2.5 ( $\text{PM}_{2.5}$ ) Stage 1	Protection of human health	Calendar year	25	-	Annual mean	1st Jan 2015
Particulate matter 2.5 ( $\text{PM}_{2.5}$ ) Stage 2	Protection of human health	Calendar year	20	-	Annual mean	1st Jan 2020
Lead (Pb)	Protection of human health	Calendar year	0.5	-	Annual mean	1st Jan 2005
Carbon Monoxide (CO)	Protection of human health	8 hours	10,000	8,620	-	1st Jan 2005
Benzene ( $\text{C}_6\text{H}_6$ )	Protection of human health	Calendar Year	5	1.5	-	1st Jan 2010

The Ozone Daughter Directive 2002/3/EC is different from the other Daughter Directives in that it sets target values and long-term objectives for ozone rather than limit values. Table 10-2 presents the limit and target values for ozone.

Table 10-2 Target values for Ozone Defined in Directive 2008/50/EC

Objective	Parameter	Target Value for 2010	Target Value for 2020
Protection of human health	Maximum daily 8 hour mean	120 $\text{mg}/\text{m}^3$ not to be exceeded more than 25 days per calendar year averaged over 3 years	120 $\text{mg}/\text{m}^3$
Protection of vegetation	AOT <sub>10</sub> calculated from 1 hour values from May to July	18,000 $\text{mg}/\text{m}^3\cdot\text{h}$ averaged over 5 years	6,000 $\text{mg}/\text{m}^3\cdot\text{h}$
Information Threshold	1 hour average	180 $\text{mg}/\text{m}^3$	-
Alert Threshold	1 hour average	240 $\text{mg}/\text{m}^3$	-

AOT<sub>10</sub> is a measure of the overall exposure of plants to ozone. It is the sum of the excess hourly concentrations greater than 80  $\mu\text{g}/\text{m}^3$  and is expressed as  $\mu\text{g}/\text{m}^3$  hours.

### 10.1.3 Air Quality Zones

The Environmental Protection Agency (EPA) has designated four Air Quality Zones for Ireland:

- > Zone A: Dublin City and environs
- > Zone B: Cork City and environs

- > Zone C: 16 urban areas with population greater than 15,000
- > Zone D: Remainder of the country.

These zones were defined to meet the criteria for air quality monitoring, assessment and management described in the Framework Directive and Daughter Directives. The sites for afforestation lie within Zone D, which represents rural areas located away from large population centres.

## 10.1.4 Likely and Significant Impacts and Associated Mitigation Measures

### 10.1.4.1 'Do-Nothing' Impact

The land has been Technically Approved and will be afforested should the proposed Curraglass Renewable Energy Development proceed or not.

### 10.1.4.2 Long Term Slight Positive Impact

The growth of trees will result in the fixation of atmospheric carbon, and the production of oxygen.

### 10.1.4.3 Short-term Imperceptible Negative Impact

#### 10.1.4.3.1 Exhaust Emissions

Some minor emissions associated with the use of an excavator for site drainage works are expected. This potential impact will not be significant and will be restricted to the duration of the drainage works.

#### Mitigation

All construction machinery will be maintained in good operational order while on-site, minimising any emissions that are likely to arise.

#### Residual Impact

Short-term Imperceptible Negative impact.

#### Significance of the Effects

Based on the above, there will be no significant effects, on air quality, associated with afforestation at the two sites.

#### 10.1.4.3.2 Dust Emissions

Potential dust emission sources include the working of an excavator. This potential impact will not be significant and will be restricted to the duration of the drainage works.

#### Mitigation

Areas of excavation will be kept to a minimum, and all works will be carried out in accordance with the Forestry Service Best Practice Guidelines described in detail in Section 2.

#### Residual Impact

Short-term Imperceptible Negative Impact.

## Significance of the Effects

Based on the above, there will be no significant effects, on air quality, associated with afforestation at the two sites.

## 10.2 Climate

### 10.2.1 Climate Change and Greenhouse gases

Although climate change is thought to be a natural process, the rate at which the climate is changing has been accelerated rapidly by human activities. Climate change is one of the most challenging global issues facing us today and is primarily the result of increased levels of greenhouse gases in the atmosphere. These greenhouse gases come primarily from the combustion of fossil fuels in energy use. Changing climate patterns are thought to increase the frequency of extreme weather conditions such as storms, floods and droughts. In addition, warmer weather trends can place pressure on animals and plants that cannot adapt to a rapidly changing environment. Moving away from our reliance on coal, oil and other fossil fuel-driven power plants is essential to reduce emissions of greenhouse gases and combat climate change.

### 10.2.2 International Policy

#### 10.2.2.1 United Nations Framework Convention on Climate Change

In 1992, countries joined an international treaty, the United Nations Framework Convention on Climate Change (UNFCCC), as a framework for international efforts to combat the challenge posed by climate change. The UNFCCC seeks to limit average global temperature increases and the resulting climate change. In addition, the UNFCCC seeks to cope with impacts that are already inevitable. It recognises that the climate system is a shared resource whose stability can be affected by industrial and other emissions of carbon dioxide and other greenhouse gases. The framework set no binding limits on greenhouse gas emissions for individual countries and contains no enforcement mechanisms. Instead, the framework outlines how specific international treaties (called "protocols" or "Agreements") may be negotiated to set binding limits on greenhouse gases.

Ireland is a Party to the Kyoto Protocol, which is a protocol to the UNFCCC. The Kyoto Protocol is an international agreement that sets limitations and reduction targets for greenhouse gases for developed countries. It came into effect in 2005, as a result of which, emission reduction targets agreed by developed countries, including Ireland, are now binding. Further details on Ireland's obligations under the Kyoto Protocol are presented below.

#### 10.2.2.2 Kyoto Protocol Targets

Under the Kyoto Protocol, the EU agreed to achieve a significant reduction in total greenhouse gas emissions of 8% below 1990 levels in the period 2008 to 2012. Ireland's contribution to the EU commitment for the period 2008 - 2012 was to limit its greenhouse gas emissions to no more than 13% above 1990 levels.

#### 10.2.2.3 Doha Amendment to the Kyoto Protocol

In Doha, Qatar, on 8<sup>th</sup> December 2012, the "Doha Amendment to the Kyoto Protocol" was adopted. The amendment includes:

- New commitments for Annex I Parties to the Kyoto Protocol who agreed to take on commitments in a second commitment period from 1 January 2013 to 31 December 2020;
- A revised list of greenhouse gases (GHG) to be reported on by Parties in the second commitment period; and

- Amendments to several articles of the Kyoto Protocol which specifically referenced issues pertaining to the first commitment period and which needed to be updated for the second commitment period.

During the first commitment period, 37 industrialised countries and the European Community committed to reduce GHG emissions to an average of 5% against 1990 levels. During the second commitment period, Parties committed to reduce GHG emissions by at least 18% below 1990 levels in the eight-year period from 2013 to 2020; however, the composition of Parties in the second commitment period is different from the first.

Under the protocol, countries must meet their targets primarily through national measures, although market based mechanisms (such as international emissions trading) can also be utilised.

#### 10.2.2.4 COP21 Paris Agreement

COP21 was the 21st session of the Conference of the Parties (COP) to the UNFCCC. Every year since 1995, the COP has gathered the 196 Parties (195 countries and the European Union) that have ratified the Convention in a different country, to evaluate its implementation and negotiate new commitments. COP21 was organised by the United Nations in Paris and held from 30th November to 12th December 2015.

COP21 closed on 12th December 2015 with the adoption of the first international climate agreement (concluded by 195 countries and applicable to all). The 12-page text, made up of a preamble and 29 articles, provides for a limitation of the global average temperature rise to well below 2°C above pre-industrial levels and to limit the increase to 1.5°C. It is flexible and takes into account the needs and capacities of each country. It is balanced as regards adaptation and mitigation, and durable, with a periodical ratcheting-up of ambitions. Ireland formally ratified the agreement on the 27th October 2016, and it entered into force on the 4th November 2016.

### 10.2.3 Replanting Area 1: Sheehaun, Co. Roscommon

#### 10.2.3.1 Baseline Environment

Ireland has a temperate, oceanic climate, resulting in mild winters and cool summers. The Met Éireann weather station at Mullingar which is located approximately 50 kilometres from the site, is the nearest weather and climate monitoring station to the proposed development site that has meteorological data recorded for the 30-year period from 1979 - 2008. Meteorological data recorded at Mullingar over the 30-year period from 1979 - 2008 is shown in Table 10-3 overleaf. The wettest months are October and December, April and July are usually the driest. July is the warmest month with an average temperature of 15.2° Celsius.

Table 10-3 Data from Met Éireann Weather Station at Mullingar, 1979 to 2008

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
<b>TEMPERATURE (degrees Celsius)</b>													
mean daily max	7.4	7.9	9.8	12.1	14.9	17.3	19.2	18.9	16.7	13.2	9.9	7.9	12.9
mean daily min	1.5	1.5	2.8	4.1	6.3	9.2	11.1	10.8	8.9	6.2	3.5	2.2	5.7
mean temperature	4.5	4.7	6.3	8.1	10.6	13.2	15.2	14.8	12.8	9.7	6.7	5	9.3
absolute max.	13.8	15.4	19.1	21.6	25	28.3	29.7	29.1	25	20.1	17.3	14.6	29.7
absolute min.	-14.9	-6.6	-8.0	-4.4	-2.6	0.2	3.8	2.1	0.0	-4.4	-6.9	-12.4	-14.9
<b>RELATIVE HUMIDITY (%)</b>													
mean at 0900UTC	90.8	89.8	87.6	81.9	78.3	79.7	82.1	84.8	87.6	89.9	91.7	91.8	86.3
mean at 1500UTC	83.4	77.8	72.8	68.1	67.1	69.1	69.9	70.6	72.1	77.0	82.2	85.9	74.7
<b>SUNSHINE (Hours)</b>													
mean daily duration	1.8	2.5	3.2	4.9	5.8	5.0	4.6	4.6	3.9	3.2	2.2	1.6	3.6
greatest daily duration	8.2	9.9	10.9	13.6	15.4	15.9	15.3	14.4	12.2	10.1	8.6	7.3	15.9
mean num. of days with no sun	10.3	7.2	5.3	2.9	1.9	2.2	1.8	1.9	3.3	5.7	8.4	11.0	62.0
<b>RAINFALL (mm)</b>													
mean monthly total	91.7	72.0	78.3	62.1	68.7	70.5	61.8	80.8	73.8	102.1	82.4	97.1	941.3
greatest daily total	30.3	24.7	29.5	27.6	26.1	52.9	26.6	58.2	42.1	48.8	43.7	38.8	58.2
mean num. of days with >= 0.2mm	19	17	20	15	16	16	16	17	17	19	18	19	209
mean num. of days with >= 1.0mm	15	13	15	11	12	11	11	13	12	14	13	14	154
mean num. of days with >= 5.0mm	6	5	5	4	5	4	3	5	4	6	6	7	60
<b>WIND (knots)</b>													
mean monthly speed	9.0	9.1	9.1	7.7	7.3	6.7	6.4	6.3	6.7	7.5	7.8	8.3	7.6
max. gust	67	71	59	56	58	48	48	50	51	59	62	73	58.5
max. mean 10-minute speed	38	36	36	30	34	26	27	28	32	36	32	39	32.8
mean num. of days with gales	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.8
<b>WEATHER (Mean No. of Days With:)</b>													
now or sleet	5.0	4.4	3.5	1.6	0.2	0.0	0.0	0.0	0.0	0.0	0.4	2.7	17.8
hail	0.6	0.9	2.0	2.0	1.1	0.2	0.1	0.1	0.1	0.5	0.2	0.3	8.1
thunder	0.1	0.2	0.2	0.3	0.9	0.9	1.2	0.8	0.1	0.1	0.1	0.1	4.9
fog	3.4	3.0	2.4	2.0	1.8	1.3	1.9	2.9	4.0	4.1	4.1	4.3	35.1

## 10.2.3.2 Potential Impacts

### 10.2.3.2.1 Long Term Slight Positive Impact

The growth of forestry allows for the fixation of atmospheric carbon as it grows.

### 10.2.3.2.2 Short Term Imperceptible Negative Impact

The use of machinery during the drainage works will result in the emission of greenhouse gases. Operations such as the transport of materials are typical examples of machinery use. This impact is considered to be imperceptible only, given the insignificant quantity of greenhouse gases that will be emitted. Planting will be carried out by hand.

#### Proposed Mitigation Measures

Planting of trees will be carried out by hand using the methods described in Section 2.3.2 above. Any drains will be constructed in accordance with the Forestry Service Best Practice Guidelines described in detail in Section 2.

#### Residual Impacts

On balance there will be positive impacts on air and climate associated with the proposed afforestation at this site.

#### Significance of the Effects

Based on the above, there will be no significant effects, on climate, associated with afforestation at this site.

## 10.2.4 Replanting Area 2: Cloghaun More, Co. Clare

### 10.2.4.1 Baseline Environment

Ireland has a temperate, oceanic climate, resulting in mild winters and cool summers. The Met Éireann weather station at Shannon Airport which is located approximately 30 kilometres from the site, is the nearest weather and climate monitoring station to the proposed development site that has meteorological data recorded for the 30-year period from 1971-2000. Meteorological data recorded at Shannon Airport over the 30-year period from 1971 - 2000 is shown in Table 10-4 overleaf. The wettest months are October and December, and April is usually the driest. July is the warmest month with an average temperature of 16.4° Celsius.

Table 10-4 Data from Met Éireann Weather Station at Shannon Airport, 1981 to 2010

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
<b>TEMPERATURE (degrees Celsius)</b>													
mean daily max	8.8	9.2	11.1	13.3	16.0	18.3	19.8	19.6	17.7	14.3	11.1	9.0	14.0
mean daily min	3.2	3.2	4.5	5.7	8.2	10.9	12.9	12.7	10.8	8.2	5.5	3.6	7.4
mean temperature	6.0	6.2	7.8	9.5	12.1	14.6	16.4	16.2	14.2	11.2	8.3	6.3	10.7
absolute max.	14.8	15.5	18.3	23.5	27.2	30.2	30.6	29.8	26.1	22.3	17.6	15.3	30.6
min. maximum	-2.4	0.9	3.5	5.4	8.0	11.8	13.8	13.0	11.1	7.0	0.8	-6.0	-6.0
max. minimum	11.8	12.3	11.7	13.0	15.3	17.8	19.4	19.3	17.8	16.3	13.4	12.9	19.4
absolute min.	-11.2	-5.5	-5.8	-2.3	0.2	3.6	6.7	4.4	1.7	-2.0	-6.6	-11.4	-11.4
<b>RELATIVE HUMIDITY (%)</b>													
mean at 0900UTC	87.1	87.0	85.0	79.8	76.3	76.8	80.0	82.1	84.7	87.0	88.9	88.4	83.6
mean at 1500UTC	80.5	74.6	70.5	64.4	63.3	65.1	68.0	68.2	69.2	75.2	80.5	83.1	71.9
<b>SUNSHINE (Hours)</b>													
mean daily duration	1.6	2.3	3.2	5.1	5.8	5.2	4.5	4.5	3.9	2.9	2.0	1.4	3.5
greatest daily duration	8.1	10.2	11.0	13.6	15.6	15.8	15.7	14.4	12.2	10.1	8.3	7.1	15.8
mean no. of days with no sun	9.2	6.4	5.7	2.4	1.9	2.0	2.4	2.3	2.9	5.5	7.8	11.1	59.8
<b>RAINFALL (mm)</b>													
mean monthly total	102.3	76.2	78.7	59.2	64.8	69.8	65.9	82.0	75.6	104.9	94.1	104.0	977.6
greatest daily total	38.2	29.4	28.1	40.2	25.0	40.6	39.5	51.0	52.3	36.9	26.9	41.2	52.3
mean num. of days with $\geq 0.2$ mm	20	16	19	16	16	15	16	18	16	20	20	19	211
mean num. of days with $\geq 1.0$ mm	16	12	14	11	12	11	12	13	12	16	15	15	159
mean num. of days with $\geq 5.0$ mm	8	5	5	4	4	4	4	5	4	7	6	7	63
<b>WIND (knots)</b>													
mean monthly speed	10.3	10.2	10.0	9.0	8.9	8.5	8.5	8.2	8.4	9.2	9.1	9.4	9.1
max. gust	75	80	65	62	59	51	52	55	62	71	66	83	83
max. mean 10-minute speed	52	46	44	40	37	37	38	35	40	47	41	57	57
mean num. of days with gales	1.7	0.9	0.8	0.3	0.2	0.1	0.0	0.1	0.1	0.6	0.7	1.2	6.7
<b>WEATHER (Mean No. of Days With:)</b>													
snow or sleet	2.3	2.3	1.4	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.3	8.0
snow lying at 0900UTC	0.6	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.9
hail	3.6	3.3	3.4	2.2	1.2	0.1	0.1	0.1	0.3	0.9	1.1	2.4	18.6



thunder	0.9	0.5	0.4	0.3	0.5	0.5	0.8	0.4	0.2	0.4	0.4	0.5	5.7
fog	3.3	2.0	2.1	1.9	1.5	1.4	1.4	2.0	2.9	2.9	3.9	4.2	29.6

## 10.2.4.2 Potential Impacts

### 10.2.4.2.1 Long Term Slight Positive Impact

The growth of forestry allows for the fixation of atmospheric carbon as it grows.

### 10.2.4.2.2 Short Term Imperceptible Negative Impact

The use of machinery during the drainage works will result in the emission of greenhouse gases. Operations such as the transport of materials are typical examples of machinery use. This impact is considered to be imperceptible only, given the insignificant quantity of greenhouse gases that will be emitted. Planting will be carried out by hand.

#### Proposed Mitigation Measures

Planting of trees will be carried out by hand using the methods described in Section 2.3.2 above. Any drains will be constructed in accordance with the Forestry Service Best Practice Guidelines described in detail in Section 2.

#### Residual Impacts

On balance there will be positive impacts on air and climate associated with the proposed afforestation at this site.

#### Significance of the Effects

Based on the above, there will be no significant effects, on climate, associated with afforestation at this site.

## 11. NOISE

### 11.1.1 Replanting Area 1: Sheehaun, Co. Roscommon

#### 11.1.1.1 Receiving Environment

The nearest sensitive locations to the afforestation site are the residential dwellings located along the local road to the south west of the site. In general, the existing noise climate is typical of a rural agricultural location. There are existing forestry plantations located in the vicinity of the site, along with a small number of agricultural yards.

#### 11.1.1.2 Likely and Significant Impacts and Associated Mitigation Measures

##### 11.1.1.2.1 'Do-Nothing' Scenario

The land has been Technically Approved and will be afforested should the proposed Curraglass Renewable Energy Development proceed or not.

#### 11.1.1.3 Planting Phase

##### 11.1.1.3.1 Construction Activities

There will potentially be an increase in noise levels in the vicinity of the proposed development site during the planting phase, as a result of the use of an excavator for drainage works. These impacts will be short-term in duration and are not considered potentially significant. The noise levels will be similar to the existing agricultural machinery in use in the vicinity of the lands which is a working rural environment. Noise at any given noise sensitive location will be variable throughout the works, depending on the distance from the excavator to the receiving properties. This is likely to have a Short-term Negative Imperceptible Impact.

##### Mitigation

Best practice measures for noise control will be adhered to onsite during the planting phase of the afforestation in order to mitigate the potentially imperceptible short-term negative impact associated with this phase of the development. The measures include:

- Noise will be controlled by prescribing that all work will be restricted to the specified working hours. Any work carried out outside of these hours shall be restricted to activities that will not generate noise of a level that may cause a nuisance.
- The excavator used on the site shall be well maintained and will comply with E.U. and Irish legislation in relation to noise emissions. The timing of on- and off-site movements of plant near occupied properties will be controlled.

##### Residual Impacts

Potential residual impacts will be imperceptible and temporary in nature

##### Significance of the Effects

Based on the above, there will be no significant effects, in relation to noise, associated with afforestation at this site.

#### 11.1.1.4 Operational Phase

##### 11.1.1.4.1 Negative Slight Short-term Impact

There will be an intermittent increase in noise levels in the vicinity of the proposed development site during the operational phase, as a result of the use of machinery for timber harvesting works. These impacts will be short-term in duration. Noise at any given noise sensitive location will be variable throughout the harvesting works, depending on the distance from the machinery to the receiving properties.

##### Mitigation

Best practice measures for noise control will be adhered to onsite during the timber harvesting at the proposed afforestation site in order to mitigate the slight short-term negative impact associated with this phase of the development. The measures include:

- Harvesting noise will be controlled by prescribing that all construction work will be restricted to the specified working hours. Any work carried out outside of these hours shall be restricted to activities that will not generate noise of a level that may cause a nuisance.
- The machinery used on the site shall be well maintained and will comply with E.U. and Irish legislation in relation to noise emissions. The timing of on- and off-site movements of plant near occupied properties will be controlled.

##### Residual Impacts

Potential residual impacts will be imperceptible and temporary in nature and not dissimilar to the existing noise sources of a working rural environment.

##### Significance of the Effects

Based on the above, there will be no significant effects, in relation to noise, associated with afforestation at this site.

#### 11.1.2 Replanting Area 2: Cloghaun More, Co. Clare

##### 11.1.2.1 Receiving Environment

The nearest sensitive location to the afforestation site is the residential dwelling located along the R483 road the splits the site down its centre into two parcels of land. In general, the existing noise climate is typical of a rural agricultural location. There are existing forestry plantations located in the vicinity of the site, along with a small number of agricultural yards.

##### 11.1.2.2 Likely and Significant Impacts and Associated Mitigation Measures

###### 11.1.2.2.1 'Do-Nothing' Scenario

The land has been Technically Approved and will be afforested should the proposed Curraglass Renewable Energy Development proceed or not.

##### 11.1.2.3 Planting Phase

###### 11.1.2.3.1 Construction Activities

There will potentially be an increase in noise levels in the vicinity of the proposed development site during the planting phase, as a result of the use of an excavator for drainage works. These impacts will be

short-term in duration and are not considered potentially significant. The noise levels will be similar to the existing agricultural machinery in use in the vicinity of the lands which is a working rural environment. Noise at any given noise sensitive location will be variable throughout the works, depending on the distance from the excavator to the receiving properties. This is likely to have a Short-term Negative Imperceptible Impact.

#### Mitigation

Best practice measures for noise control will be adhered to onsite during the planting phase of the afforestation in order to mitigate the potentially imperceptible short-term negative impact associated with this phase of the development. The measures include:

- Noise will be controlled by prescribing that all work will be restricted to the specified working hours. Any work carried out outside of these hours shall be restricted to activities that will not generate noise of a level that may cause a nuisance.
- The excavator used on the site shall be well maintained and will comply with E.U. and Irish legislation in relation to noise emissions. The timing of on- and off-site movements of plant near occupied properties will be controlled.

#### Residual Impacts

Potential residual impacts will be imperceptible and temporary in nature

#### Significance of the Effects

Based on the above, there will be no significant effects, in relation to noise, associated with afforestation at this site.

### 11.1.2.4 Operational Phase

#### 11.1.2.4.1 *Negative Slight Short-term Impact*

There will be an intermittent increase in noise levels in the vicinity of the proposed development site during the operational phase, as a result of the use of machinery for timber harvesting works. These impacts will be short-term in duration. Noise at any given noise sensitive location will be variable throughout the harvesting works, depending on the distance from the machinery to the receiving properties.

#### Mitigation

Best practice measures for noise control will be adhered to onsite during the timber harvesting at the proposed afforestation site in order to mitigate the slight short-term negative impact associated with this phase of the development. The measures include:

- Harvesting noise will be controlled by prescribing that all construction work will be restricted to the specified working hours. Any work carried out outside of these hours shall be restricted to activities that will not generate noise of a level that may cause a nuisance.
- The machinery used on the site shall be well maintained and will comply with E.U. and Irish legislation in relation to noise emissions. The timing of on- and off-site movements of plant near occupied properties will be controlled.

#### Residual Impacts

Potential residual impacts will be imperceptible and temporary in nature and not dissimilar to the existing noise sources of a working rural environment.



### Significance of the Effects

Based on the above, there will be no significant effects, in relation to noise, associated with afforestation at this site.

## 12. POPULATION AND HEALTH

This section of the report describes the potential impacts of the proposed afforestation on Population & Human Health, and has been completed in accordance with the guidance set out by the Environmental Protection Agency in *'Draft Guidelines on the Information to be contained in Environmental Impact Statements'* (EPA, 2017).

One of the principle concerns in the development process is that people, as individuals or communities, should experience no diminution in their quality of life from the direct or indirect impacts arising from the construction and operation of a development. Ultimately, all the impacts of a development impinge on human health, directly and indirectly, positively and negatively. The key issues examined in this section of the document include population, employment, health and safety, land-use, residential amenity, community facilities and services, and tourism.

### 12.1 Replanting Area 1: Sheehaun, Co. Roscommon

#### 12.1.1 Baseline Environment

The Sheehaun site is located approximately 3.5 kilometres to the northwest of Lanesborough, Co. Longford and 10 kilometres to the northeast of Roscommon town, Co. Roscommon. The site is located within the District Electoral Division (DED) of Kilgefin. The proposed replanting site is accessed from a local road to the west of the site. The overall level of residential development in the area around the site is low, and comprises one-off houses located along the local road. The nearest major settlement to the proposed replanting site is Lanesborough, located approximately 3.5 kilometres to the southeast of the site.

##### 12.1.1.1 Employment

Socio-economic grouping divides the population into categories depending on the level of skill or educational attainment required. The 'Higher Professional' category includes scientists, engineers, solicitors, town planners and psychologists. The 'Lower Professional' category includes teachers, lab technicians, nurses, journalists, actors and driving instructors. Skilled occupations are divided into 'Manual Skilled', such as bricklayers and building contractors; 'Semi-skilled', e.g. roofers and gardeners; and 'Unskilled', which includes construction labourers, refuse collectors and window cleaners.

The highest level of employment within the Kilgefin DED is within the 'Non-manual' and 'Lower Professional' categories at 70 persons and 48 persons, respectively. The total population in this DED in Census 2016 was 318.

##### 12.1.1.2 Land-use

The current land-use on the proposed replanting area is agriculture. This site is located within a rural, working landscape in which agriculture and forestry form the primary land-uses. There are areas of existing coniferous forestry to the north, south and east of the site.

##### 12.1.1.3 Community Facilities and Amenities

There are no community facilities or amenities located within or in the vicinity of the proposed replanting site. The nearest retail services, schools and community facilities to the sites are located in the town of Lanesborough, located approximately 3.5 kilometres to the southeast of the site.

#### 12.1.1.4 Tourism

Ireland is divided into eight tourism regions. The West region, in which the Sheehaun site is located, comprises Counties Galway, Mayo and Roscommon. There are no tourist attractions located in the vicinity of the proposed replanting sites. The nearest tourist attractions or facilities are located in the village of Lanesborough, including B&B's, Pubs and a marina. The nearest walking route, 'Lanesborough Commons Walk' is located to the south of the Lanesborough town.

### 12.1.2 Potential Impacts

#### 12.1.2.1 'Do-Nothing' Scenario

In the event that the proposed Curraglass Renewable Energy Development does not proceed, the proposed replanting land at Sheehaun will still be afforested, as per the specifications of the Technical Approval document for the site.

#### 12.1.2.2 Population

Afforestation of the replanting land at Sheehaun will have no impact on population trends or population density in the vicinity of the site.

#### 12.1.2.3 Employment

The preparation and planting of the proposed replanting land will provide short-term employment for three people; one person to operate an excavator for installation of drainage features, and two people to plant the site by hand.

In the longer-term, maintenance and felling of the site will provide part-term employment for two people.

#### 12.1.2.4 Health and Safety

Health and safety in forestry is the concern of all those involved, including forest owners, managers, supervisors, operators, recreational users and trespassers (*'Code of Best Forest Practice'*, Forest Service, 2000). Forest practice must ensure that operations do not endanger workers and others. In the absence of the correct health and safety measures, forestry-related activities have the potential to have a significant negative effect on the health and safety of workers and members of the public, on and in the vicinity of the site.

The Forest Service's *'Code of Best Forest Practice'* states that the Safety, Health and Welfare at Work Act 2005 and the Safety, Health and Welfare at Work (General Application) Regulations 2007 as amended, place responsibilities on all involved in work activities, and set out a basis for managing health and safety in all workplaces. Forest owners have legal responsibilities to ensure that the workplace and all articles and substances situated there are safe and free from health risk. This involves informing contractors of potential hazards, work agreements and monitoring. Employers, self-employed and employees all have clear responsibility to ensure safe working practices for themselves and others.

All Forest Service guidelines and Health and Safety legislation will be adhered to during all forestry-related activities at the proposed replanting land. The residual potential for a significant negative impact on worker and public health and safety is therefore reduced to minimal.

#### 12.1.2.5 Land-use

Afforestation of the proposed replanting site will result in a long-term change in use of the site, from agriculture to forestry. This change in land-use is in keeping with the character of the surrounding landscape, as forestry is already an established land-use in the area. The impact of the change in land-use is therefore neutral, i.e. a change which does not affect the quality of the environment.

### 12.1.3 Residential Amenity

Planting at the site will have no impact on the residential amenity of the area.

### 12.1.4 Community Facilities and Amenities

There are no community facilities or amenities located on or in the immediate vicinity of the proposed replanting land. No recreational walks are located close to the proposed replanting site, as described in Section 12.1.1.4 above. There will be no impact to these or any other community amenities within the wider area. All appropriate health and safety measures, including signage, will be adopted at the site to ensure the safety of workers and the general public.

### 12.1.5 Tourism

Afforestation of the proposed replanting land will have no impact on tourism. There are no tourist facilities or attractions located on or in the immediate vicinity of the proposed replanting land. Forestry is an established land-use in this area, and a common feature in the landscape.

## 12.2 Replanting Area 2: Cloghaun More, Co. Clare

### 12.2.1 Baseline Environment

The Cloghaun More site is located approximately 6 kilometres to the northeast of Doonbeg, Co. Clare and 8.5 kilometres to the northwest of Kilmihil, Co. Clare. The site is located within the District Electoral Divisions (DED) of Creagh. The proposed replanting site is accessed from the R483 the runs through the centre of the site. The overall level of residential development in the area around the site is low, and comprises one-off houses located along the local roads. The nearest major settlement to the proposed replanting site is Doonbeg, located approximately 6 kilometres to the southwest of the site.

#### 12.2.1.1 Employment

Socio-economic grouping divides the population into categories depending on the level of skill or educational attainment required. The 'Higher Professional' category includes scientists, engineers, solicitors, town planners and psychologists. The 'Lower Professional' category includes teachers, lab technicians, nurses, journalists, actors and driving instructors. Skilled occupations are divided into 'Manual Skilled', such as bricklayers and building contractors; 'Semi-skilled', e.g. roofers and gardeners; and 'Unskilled', which includes construction labourers, refuse collectors and window cleaners.

The highest level of employment within the Creagh DED is within the 'Farmers and 'Non-manual' categories at 111 persons and 61 persons, respectively. The total population in this DED in Census 2016 was 427.

#### 12.2.1.2 Land-use

The current land-use on the proposed replanting area is agriculture. This site is located within a rural, working landscape in which agriculture and forestry form the primary land-uses. There are areas of existing coniferous forestry to the northwest and south of the site.

#### 12.2.1.3 Community Facilities and Amenities

There are no community facilities or amenities located within or in the vicinity of the proposed replanting site. The nearest retail services, schools and community facilities to the sites are located in the town of Doonbeg, approximately 6 kilometres southwest of the site.

#### 12.2.1.4 Tourism

Ireland is divided into eight tourism regions. The Mid West region, in which the replanting site is located, comprises Counties Clare, Limerick and Tipperary (North). There are no tourist attractions located in the vicinity of the proposed replanting sites. The nearest tourist attraction is the Trump International Golf course is located approximately 4.5 kms to the west of the site. Other tourist attractions or facilities are located in the village of Doonbeg, including B&B's and Pubs.

### 12.2.2 Potential Impacts

#### 12.2.2.1 'Do-Nothing' Scenario

In the event that the proposed Curraglass Renewable Energy Development does not proceed, the proposed replanting land at Cloghaun More will still be afforested, as per the specifications of the Technical Approval document for the site.

#### 12.2.2.2 Population

Afforestation of the replanting land at Cloghaun More will have no impact on population trends or population density in the vicinity of the site.

#### 12.2.2.3 Employment

The preparation and planting of the proposed replanting land will provide short-term employment for three people; one person to operate an excavator for installation of drainage features, and two people to plant the site by hand.

In the longer-term, maintenance and felling of the site will provide part-term employment for two people.

#### 12.2.2.4 Health and Safety

Health and safety in forestry is the concern of all those involved, including forest owners, managers, supervisors, operators, recreational users and trespassers (*'Code of Best Forest Practice'*, Forest Service, 2000). Forest practice must ensure that operations do not endanger workers and others. In the absence of the correct health and safety measures, forestry-related activities have the potential to have a significant negative effect on the health and safety of workers and members of the public, on and in the vicinity of the site.

The Forest Service's *'Code of Best Forest Practice'* states that the Safety, Health and Welfare at Work Act 2005 and the Safety, Health and Welfare at Work (General Application) Regulations 2007 as amended, place responsibilities on all involved in work activities, and set out a basis for managing health and safety in all workplaces. Forest owners have legal responsibilities to ensure that the workplace and all articles and substances situated there are safe and free from health risk. This involves informing contractors of potential hazards, work agreements and monitoring. Employers, self-employed and employees all have clear responsibility to ensure safe working practices for themselves and others.

All Forest Service guidelines and Health and Safety legislation will be adhered to during all forestry-related activities at the proposed replanting land. The residual potential for a significant negative impact on worker and public health and safety is therefore reduced to minimal.

#### 12.2.2.5 Land-use

Afforestation of the proposed replanting site will result in a long-term change in use of the site, from agriculture to forestry. This change in land-use is in keeping with the character of the surrounding landscape, as forestry is already an established land-use in the area. The impact of the change in land-use is therefore neutral, i.e. a change which does not affect the quality of the environment.

### 12.2.3 Residential Amenity

Planting at the site will have no impact on the residential amenity of the area.

### 12.2.4 Community Facilities and Amenities

There are no community facilities or amenities located on or in the immediate vicinity of the proposed replanting land. No recreational walks are located close to the proposed replanting site. There will be no impact to these or any other community amenities within the wider area. All appropriate health and safety measures, including signage, will be adopted at the site to ensure the safety of workers and the general public.

### 12.2.5 Tourism

Afforestation of the proposed replanting land will have no impact on tourism. There are no tourist facilities or attractions located on or in the immediate vicinity of the proposed replanting land. Forestry is an established land-use in this area, and a common feature in the landscape.

## 13. MATERIAL ASSETS

Material Assets are resources that are valued and intrinsic to specific places. Economic assets of natural heritage include non-renewable resources such as minerals or soils, and renewable resources such as wind and water. These assets are dealt with in Sections 6, 7 and 8 of this report. Cultural assets are discussed in Section 9. Transportation infrastructure and land-use practices, which are economic assets of human origin, are discussed in this section of the report.

### 13.1 Replanting Area 1: Sheehaun, Co. Roscommon

#### 13.1.1 Transportation

The proposed replanting site is accessed via a local road, which runs along the southern border of the site.

Traffic movements associated with the preparation and planting of the site will be minimal. Preparation of the site will require the use of an excavator for drainage, and travel to the site by the driver. Planting of the site will be by hand, and will be carried out by one to two people over a two-week period approximately.

Forestry felling can occur within 0.8-1 km of access points (roads and tracks) to the main forest body. Due to the small size of the proposed replanting area, additional access tracks or roads will not be required.

#### 13.1.2 Land-Use

Land-use on the site will change from agriculture to coniferous forestry. Forestry, like agriculture, is an extractive industry, i.e. it produces a raw material which is then processed to add value. The use of the proposed replanting lands for coniferous forestry will have a positive effect on the economic assets of the site.

#### 13.1.3 Potential Impacts

##### 13.1.3.1 'Do-Nothing' Scenario

In the event that the proposed Curraglass Renewable Energy Development does not proceed, the proposed replanting land at Sheehaun will still be afforested, as per the specifications of the Technical Approval document for the site.

##### 13.1.3.2 Traffic

Planting of the proposed site will have an imperceptible impact on local traffic, given the low volume of traffic associated with planting and felling.

##### 13.1.3.3 Land-use

The use of the proposed replanting land for coniferous forestry will have a positive effect on the economic assets of the site. In terms of the wider landscape, afforestation of the proposed site will be assimilated easily into the received environment.

##### 13.1.3.4 Significance of the Effects

Based on the above, there will be no significant effects, on land use and traffic, associated with afforestation at this site.

## 13.2 Replanting Area 2: Cloghaun More, Co. Clare

### 13.2.1 Transportation

The proposed replanting site is accessed from the R483 the runs through the centre of the site. Traffic movements associated with the preparation and planting of the site will be minimal. Preparation of the site will require the use of an excavator for drainage, and travel to the site by the driver. Planting of the site will be by hand, and will be carried out by one to two people over a two-week period approximately.

Forestry felling can occur within 0.8-1 km of access points (roads and tracks) to the main forest body. Due to the small size of the proposed replanting area, additional access tracks or roads will not be required.

### 13.2.2 Land-Use

Land-use on the site will change from agriculture to coniferous forestry. Forestry, like agriculture, is an extractive industry, i.e. it produces a raw material which is then processed to add value. The use of the proposed replanting lands for coniferous forestry will have a positive effect on the economic assets of the site.

### 13.2.3 Potential Impacts

#### 13.2.3.1 'Do-Nothing' Scenario

In the event that the proposed development at Curraglass Renewable Energy Development does not proceed, the proposed replanting land at Cloghaun More will still be afforested, as per the specifications of the Technical Approval document for the site.

#### 13.2.3.2 Traffic

Planting of the proposed site will have an imperceptible impact on local traffic, given the low volume of traffic associated with planting and felling.

#### 13.2.3.3 Land-use

The use of the proposed replanting land for coniferous forestry will have a positive effect on the economic assets of the site. In terms of the wider landscape, afforestation of the proposed site will be assimilated easily into the received environment.

#### 13.2.3.4 Significance of the Effects

Based on the above, there will be no significant effects, on land use and traffic, associated with afforestation at this site.

#### 13.2.3.5 Land-use

The use of the proposed replanting land for coniferous forestry will have a positive effect on the economic assets of the site. In terms of the wider landscape, afforestation of the proposed site will be assimilated easily into the received environment.

#### 13.2.3.6 Significance of the Effects

Based on the above, there will be no significant effects, on land use and traffic, associated with afforestation at this site.



## **APPENDIX 1**

***TECHNICAL APPROVAL DOCUMENTS***

190135966 - Malachy Murphy  
✓sc

RECEIVED

30 MAY 2019



Department of  
**Agriculture,  
Food and the Marine**  
An Roinn  
**Talmhaíochta,  
Bia agus Mara**

JOHN O'REILLY  
GREEN BELT LTD  
MAIN STREET  
VIRGINIA  
CO CAVAN

28 day up 24/6/19  
28/05/2019

Application for Technical Approval for an Afforestation Licence

Forest Owner	FO130973S
Contract Number	CN82803
Townland	Sheehaun (morton)
County	Roscommon
Approved Area (ha)	7.73
Fencing Length (lm)	1,400.00

copy to  
Joe Tansey

**This is technical approval for an afforestation licence only and is not grant approval. You should note that the project will not be eligible for grant aid unless prior financial approval has been given in writing in advance of commencement of planting. Also, to qualify for Afforestation grant and premiums applicants must own, lease or be in joint management of the lands proposed for planting. You should consult with your registered forester about applying for financial approval under the Scheme.**

I refer to your application for an afforestation licence as described above and shown on the enclosed map. Your application has been assessed and a licence is hereby issued on the basis that the works will be undertaken in accordance with the prescription set out in Appendix A, attached herewith. You are now required to remove your site notice immediately.

This scheme is financed by the State and payment of the grant, if financial approval is given, is subject to the following conditions:

1. Availability of funds in each financial year.
2. Submission of a fully completed and signed Form 2 (Application for Payment) and the following documents to support this application.

Proof of Ownership (including removal of any constraints on ownership)

Valid Mandate

Current Tax Clearance Certificate(s)

C2 Certificate

Provenance Certificates

Fencing Map

Biodiversity Map

Certified Species Map

\* Note Cond on Pg 4

3. Satisfactory completion of the work not later than 28/05/2022.
4. Compliance with Operational Proposals and Specifications enclosed.
5. Compliance with Departmental guidelines and requirements for Landscape, Water Quality, Harvesting, Biodiversity and Archaeology.



6. Compliance with Ecological Survey and Management Plan as submitted (if applicable).
7. The work is carried out by the registered company or forester specified on the original application. If it is intended to have a different company or forester undertake the work, it will be necessary to submit a new application (Form 1) to the Forest Service.
8. All applications are subject to the provisions of the penalty schedules as set out in the Afforestation Grant and Premium Scheme document.
9. All applications are subject to Cross Compliance checks with other grant schemes.
10. Grant payment may be subject to the netting policy of the Department of Agriculture, Food and the Marine.
11. This licence is issued subject to the terms and conditions of the Forestry Standards and Procedures Manual.
12. Your acceptance that the responsibility for the ultimate success of the plantation rests with you, the applicant. Plantations which fail to establish successfully will result in grant and premium recoupment.
13. Additional Environmental & Silvicultural Conditions
  - Only required fencing as stipulated in Section 12 of the Forestry Standards Manual will be eligible for payment,
  - Adhere to Environmental Requirements for Afforestation,
  - All guidelines to apply,
  - Adhere to forestry & water quality guidelines

You are required to notify the Department of Agriculture, Food and the Marine in writing if any of the details of your application have changed. Changes to your application may invalidate this licence.

In order to allow for the possibility of appeals, you must not commence any works until 28 days from the date of this letter have elapsed. If an appeal is lodged, this licence will be suspended and no work may commence until the appeal process has concluded.

If you wish to appeal any condition attached to this licence, where applicable, you should do so in writing within 28 days of the date of this letter to the Forestry Appeals Committee. You must set out the grounds of your appeal and include a statement of the facts and contentions upon which you intend to rely along with any documentary evidence you wish to submit in support of your appeal. The appeal must be sent to the Forestry Appeals Committee, Kilminchy Court, Portlaoise, Co. Laois, Lo-Call 076 1064418 or 057 8631900.

Yours sincerely

COLIN GALLAGHER  
Approval Section  
Forestry Division


Operational Proposals for Technical Approval for an Afforestation Licence

Forest Owner Number	FO130973S
Contract Number	CN82803
Townland	Sheehaun (morton)
County	Roscommon
Area Approved	7.73(ha)
Fencing Length (LM)	1,400.00

All applications must be developed in accordance with detailed standards and procedures as described in the current Forestry Schemes Manual. Certain specific operational proposals particular to this application are described below. No change is permitted to these proposals and species approved unless approved in advance by the Department. The Department may insist that proposed changes constitutes a new application.

**Operational Proposal Details**

<b>Agro Forestry (GPC 11)</b>		
1.	Tree Shelters	Not Entered
2.	Plant Size and Stocking	Not Entered
<b>Drainage</b>		
1.	Drainage	Not Required
2.	Drainage Comment	500
<b>Fertiliser</b>		
1.	Zero	Not Entered
2.	350 Kg Granulated Rock Phosphate	Not Entered
3.	250 Kg Granulated Rock Phosphate	Yes
4.	Split Application	Not Entered
5.	Other Details	50
<b>Firebreaks/Res.</b>		
1.	Firebreaks/Res	Not Required
<b>Forestry for Fibre (GPCs: 12a and 12b )</b>		
1.	Is Land Free Drainage arable or pasture soils	Not Entered
2.	Are there surface water gleys without a peat layer	Not Entered
3.	Do you intend to use improved genetic material	Not Entered
4.	Details	500
<b>Ground Prep.</b>		
1.	Woody Weed Removal	Yes
2.	Ripping	Not Entered
3.	Pit Plant	Not Entered
4.	Mole Drainage	Not Entered
5.	Mounding	Yes
6.	Ploughing	Not Entered
9.	Other Details	50
<b>Planting Method</b>		
1.	Angle Notch	Yes
2.	Pit	Not Entered
3.	Machine	Not Entered



4.	Slit	Not Entered		
5.	Other Details	50		
<b>Road Access</b>				
1.	Road Access	Provided		
<b>Standard Stocking</b>				
1.	Standard Stocking	Yes		
2.	Details	50		
<b>Weed Control</b>				
1.	Herbicide Control yr0	Not Entered		
2.	Herbicide Control yr1	Yes		
3.	Herbicide Control yr2	Yes		
3.	Herbicide Control yr4	Not Entered		
4.	Manual	Not Entered		
4.	Herbicide Control yr3	Not Entered		
<b>Fencing Details</b>				
(metres)	Stock	1400	Stock-Sheep	0
	Stock-Rabbit	0	Upgrade to Deer	0
	Deer-Rabbit	0	Deer	0
	Upgrade Existing Fence(s)	N	Tree Shelter (Hectares)	0
	Upgrade Details: None Entered			

### Species Approved

The species approved in this proposal relate to the digitised certified species map attached.

#### Species Approved for Afforestation

Plot	Area	GPC	Land Type	Species	Species Area	Yield Class	Mixture Type	Exclusion	Exclusion Type
1	7.48	GPC 3	CHF	SS	6.7	24	Pure		
				PO	1.2	8			
2	.25	GPC 3	Bio				None		

### Additional Silvicultural and Environmental Conditions

In addition to the Department's environmental and silvicultural guidelines the following specific conditions apply to this proposal:

#### Silvicultural and Environmental Conditions

Only required fencing as stipulated in Section 12 of the Forestry Standards Manual will be eligible for payment,  
 Adhere to Environmental Requirements for Afforestation,  
 All guidelines to apply,  
 Adhere to forestry & water quality guidelines



Certified Species Information

Contract Number	CN82803
Townland	Sheehaun (morton)
County	Roscommon
6" OS No:	RN36

Plot No	GPC	Parcel No	GPC Area(H)	Land Use Type	Species Area	Species	Mixture Type	Excl Area(h)	Excl Type
1	3	49016894	7.48	CHF	7.9	PO,SS	Pure	0	
2	3	49016856	.25	Bio	0		None	0	
<b>TOTALS</b>			<b>7.73</b>		<b>7.9</b>			<b>0</b>	

**Remarks:**

**Area Surveyed By:**

**Date:**

**Species Certified By:**

**Date:**

RECEIVED  
22 JAN 2020



200536499  
Mike Moraney

JOHN O'REILLY  
GREEN BELT LTD  
MAIN STREET  
VIRGINIA  
CO CAVAN

28 day up 17/2/20

21/01/2020

Application for Technical Approval for an Afforestation Licence

Forest Owner	FO127900U
Contract Number	CN83600
Townland	Cloghaun more (west)
County	Clare
Approved Area (ha)	17.22
Fencing Length (lm)	1,600.00

copy to  
JP + Mike

**This is technical approval for an afforestation licence only and is not grant approval. You should note that the project will not be eligible for grant aid unless prior financial approval has been given in writing in advance of commencement of planting. Also, to qualify for Afforestation grant and premiums applicants must own, lease or be in joint management of the lands proposed for planting. You should consult with your registered forester about applying for financial approval under the Scheme.**

I refer to your application for an afforestation licence as described above and shown on the enclosed map. Your application has been assessed and a licence is hereby issued on the basis that the works will be undertaken in accordance with the prescription set out in Appendix A, attached herewith. You are now required to remove your site notice immediately.

This scheme is financed by the State and payment of the grant, if financial approval is given, is subject to the following conditions:

1. Availability of funds in each financial year.
2. Submission of a fully completed and signed Form 2 (Application for Payment) and the following documents to support this application.

Proof of Ownership (including removal of any constraints on ownership)

Valid Mandate

Current Tax Clearance Certificate(s)

C2 Certificate

Provenance Certificates

Fencing Map

Biodiversity Map

Certified Species Map

\*NOTE cond on Pg 2.

3. Satisfactory completion of the work not later than 21/01/2023.
4. Compliance with Operational Proposals and Specifications enclosed.
5. Compliance with Departmental guidelines and requirements for Landscape, Water Quality, Harvesting, Biodiversity and Archaeology.



6. Compliance with Ecological Survey and Management Plan as submitted (if applicable).
7. The work is carried out by the registered company or forester specified on the original application. If it is intended to have a different company or forester undertake the work, it will be necessary to submit a new application (Form 1) to the Forest Service.
8. All applications are subject to the provisions of the penalty schedules as set out in the Afforestation Grant and Premium Scheme document.
9. All applications are subject to Cross Compliance checks with other grant schemes.
10. Grant payment may be subject to the netting policy of the Department of Agriculture, Food and the Marine.
11. This licence is issued subject to the terms and conditions of the Forestry Standards and Procedures Manual.
12. Your acceptance that the responsibility for the ultimate success of the plantation rests with you, the applicant. Plantations which fail to establish successfully will result in grant and premium recoupment.
13. Additional Environmental & Silvicultural Conditions
  - Regarding any existing relevant watercourses (e.g. existing field drain), do not clean any section of such watercourses within 50 m of an aquatic zone.,
  - Adhere to all water protection measures relating to cultivation, fertilisation, herbicide application, the location of onsite storage depots and the disposal of waste, set out in the Environmental Requirements for Afforestation (DAFM, 2016).,
  - Do not remove or disturb any areas of wet woodland, carr (woodland growing on wet ground or waterlogged soil usually dominated by alder or willow species) and thick scrub on the site within 50 m of an aquatic zone or within 20 m of a relevant watercourse.,
  - Water Buffer Zone Setback 20m

You are required to notify the Department of Agriculture, Food and the Marine in writing if any of the details of your application have changed. Changes to your application may invalidate this licence.

In order to allow for the possibility of appeals, you must not commence any works until 28 days from the date of this letter have elapsed. If an appeal is lodged, this licence will be suspended and no work may commence until the appeal process has concluded.

If you wish to appeal any condition attached to this licence, where applicable, you should do so in writing within 28 days of the date of this letter to the Forestry Appeals Committee. You must set out the grounds of your appeal and include a statement of the facts and contentions upon which you intend to rely along with any documentary evidence you wish to submit in support of your appeal. The appeal must be sent to the Forestry Appeals Committee, Kilminchy Court, Portlaoise, Co. Laois, Lo-Call 076 1064418 or 057 8631900.

Yours sincerely

LISA CHIGARA  
Approval Section  
Forestry Division



Operational Proposals for Technical Approval for an Afforestation Licence

Forest Owner Number	FO127900U
Contract Number	CN83600
Townland	Cloghaun more (west)
County	Clare
Area Approved	17.22(ha)
Fencing Length (LM)	1,600.00

All applications must be developed in accordance with detailed standards and procedures as described in the current Forestry Schemes Manual. Certain specific operational proposals particular to this application are described below. No change is permitted to these proposals and species approved unless approved in advance by the Department. The Department may insist that proposed changes constitutes a new application.

**Operational Proposal Details**

<b>Agro Forestry (GPC 11)</b>		
1.	Tree Shelters	Not Entered
2.	Plant Size and Stocking	Not Entered
<b>Drainage</b>		
1.	Drainage	Required
2.	Drainage Comment	500
<b>Fertiliser</b>		
1.	Zero	Not Entered
2.	350 Kg Granulated Rock Phosphate	Not Entered
3.	250 Kg Granulated Rock Phosphate	Yes
4.	Split Application	Not Entered
5.	Other Details	50
<b>Firebreaks/Res.</b>		
1.	Firebreaks/Res	Required
<b>Forestry for Fibre (GPCs: 12a and 12b )</b>		
1.	Is Land Free Drainage arable or pasture soils	Not Entered
2.	Are there surface water gleys without a peat layer	Not Entered
3.	Do you intend to use improved genetic material	Not Entered
4.	Details	500
<b>Ground Prep.</b>		
1.	Woody Weed Removal	Not Entered
2.	Ripping	Not Entered
3.	Pit Plant	Not Entered
4.	Mole Drainage	Not Entered
5.	Mounding	Yes
6.	Ploughing	Not Entered
9.	Other Details	50
<b>Planting Method</b>		
1.	Angle Notch	Not Entered
2.	Pit	Not Entered
3.	Machine	Not Entered



4.	Slit	Yes		
5.	Other Details	50		
<b>Road Access</b>				
1.	Road Access	Provided		
<b>Standard Stocking</b>				
1.	Standard Stocking	Yes		
2.	Details	50		
<b>Weed Control</b>				
1.	Herbicide Control yr0	Yes		
2.	Herbicide Control yr1	Yes		
3.	Herbicide Control yr2	Yes		
3.	Herbicide Control yr4	Not Entered		
4.	Manual	Yes		
4.	Herbicide Control yr3	Not Entered		
<b>Fencing Details</b>				
(metres)	Stock	1600	Stock-Sheep	0
	Stock-Rabbit	0	Upgrade to Deer	0
	Deer-Rabbit	0	Deer	0
	Upgrade Existing Fence(s)	N	Tree Shelter (Hectares)	0
	Upgrade Details: None Entered			

### Species Approved

The species approved in this proposal relate to the digitised certified species map attached.

#### Species Approved for Afforestation

Plot	Area	GPC	Land Type	Species	Species Area	Yield Class	Mixture Type	Exclusion	Exclusion Type
1	10.51	GPC 3	CHF	SS	8.93	20	Groups		
				ADB	1.58	10			
2	.31	GPC 3	Bio				None		
3	.86	GPC 3	CHF	SS	.73	20	Groups		
				ADB	.13	10			
4	5.29	GPC 3	CHF	SS	4.5	20	Groups		
				ADB	.79	10			
5	.25	GPC 3	Bio				None		

### Additional Silvicultural and Environmental Conditions

In addition to the Department's environmental and silvicultural guidelines the following specific conditions apply to this proposal:

#### Silvicultural and Environmental Conditions

Regarding any existing relevant watercourses (e.g. existing field drain), do not clean any section of such watercourses within 50 m of an aquatic zone.,

Adhere to all water protection measures relating to cultivation, fertilisation, herbicide application, the location of onsite storage depots and the disposal of waste, set out in the Environmental Requirements for Afforestation (DAFM, 2016)., Do not remove or disturb any areas of wet woodland, carr (woodland growing on wet ground or waterlogged soil usually dominated by alder or willow species) and thick scrub on the site within 50 m of an aquatic zone or within 20 m of a

**An Roinn Talmhaíochta,  
Bia agus Mara**  
Department of Agriculture,  
Food and the Marine



relevant watercourse.,  
Water Buffer Zone Setback 20m

Certified Species Information

Contract Number	CN83600
Townland	Cloghaun more (west)
County	Clare
6" OS No:	CE38

Plot No	GPC	Parcel No	GPC Area(H)	Land Use Type	Species Area	Species	Mixture Type	Excl Area(h)	Excl Type
1	3	50010664	10.51	CHF	10.51	ADB,SS	Groups	0	
2	3	50010236	.31	Bio	0		None	0	
3	3	50010255	.86	CHF	.86	ADB,SS	Groups	0	
4	3	50010429	5.29	CHF	5.29	ADB,SS	Groups	0	
5	3	50010523	.25	Bio	0		None	0	
<b>TOTALS</b>			<b>17.22</b>		<b>16.66</b>			<b>0</b>	

**Remarks:**

**Area Surveyed By:**

**Date:**

**Species Certified By:**

**Date:**



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Contract: **CN83600**

Scale 1: 5000

