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Appropriate Assessment Screening Report & Natura Impact Statement



**Aghamore,
Co. Sligo**



ASH Ecology & Environmental

Appropriate Assessment Screening Report & Natura Impact Statement - Aghamore, Co. Sligo

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1.0 Introduction

1.1 Purpose of the Report

This Appropriate Assessment (AA) Screening Assessment and Stage II Natura Impact Statement was undertaken by Ash Ecology & Environmental Ltd (AEE) on behalf of Colm Burns as part of a request for further information for Planning Application 22/55 from Sligo County Council (SCC). The planning application is for a proposed dwelling, garage and packaged wastewater treatment system (WWTS) and percolation area at Aghamore, Co. Sligo (Grid Ref: 54.238639, -8.451129), see Figure 1 for Site Location and Figure 2 for aerial photo of site and surrounding landscapes. The purpose of the assessment was to determine the potential impacts, if any, of the proposed works on nearby sites with European conservation designations (i.e. Natura 2000 sites).

1.2 Competency of Assessor

This report has been prepared by Aisling Walsh whose qualifications include MSc in Biodiversity and Conservation (TCD) and B.Sc. (Hons) Zoology (NUIG). Aisling is the Managing Director of Ash Ecology & Environmental Ltd and has over 15 years of experience providing environmental consultancy and environmental assessment services. Aisling also has extensive experience undertaking forestry research in Trinity College Dublin (TCD) and teaching in the Life Sciences Department of University of Limerick (UL). Aisling has written numerous Ecological Impact Assessments (EclA), Screening for Appropriate Assessment Stage I and Stage II Natura Impact Statements, Environmental Impact Assessments/Statements, Badger Surveys, Bat Surveys, Bird and Habitat Surveys. She has also provided input and reviewed Ecological and Environmental assessments for several EIS and EIAR and conducted numerous noise surveys for EPA licenced facilities. AEE is listed as a Registered Practice by the CIEEM (see Appendix A) and a member of Bat Conservation Ireland. Aisling Walsh is a licenced bat ecologist (e.g. DER/BAT 2020 – 46 EUROPEAN, DER/BAT 2020 – 48 EUROPEAN).

1.3 Project Description

This project is for the construction of a dwelling house, garage, WWTS and percolation area with all ancillary site works.

The site comprises of 0.28Ha. The proposed site layout is shown as Figure 3.

The site suitability assessment attached to original planning application details a new watermain connection will be made to the public mains. The sewage system will be via an EPA approved Waste Water Treatment and Percolation Area. The system will be serviced and maintained annually with a contract in place. Further information is given in the Site Characterisation Form (SCF) accompanying this application (Middleton Engineering, January 2022). In summary the WWTS proposes:

1. Site suitable for effluent treatment unit and soil polishing filter due to sloped site.
2. "T" value in the range from 3-20. minimum area of filter required is $3.75 \times 6 = 22.5$ square metres. 23 square metres of filter bed proposed for site.
3. A minimum 300mm stone bed to be used below the invert of puraflo modules.
4. It is proposed to install a proprietary effluent treatment unit followed by two puraflo modules to complete tertiary treatment.
5. Effluent will flow by gravity to the effluent treatment unit and pumped from the secondary treatment system to two puraflo modules.
6. No dropped manhole will be required in the foul sewer pipe run and a fall of 1 in 60 must be maintained to the effluent treatment system.

Surface water run-off from the proposed development will be directed to a proposed soakway.

During earthmoving and construction works waste-water/foul effluent will be managed at a temporary site compound (e.g. site portaloos and welfare units) with all waste removed from site by licenced waste disposal.

2.0 Desk Review

This report has been prepared by AEE using the following guidance documents:

- European Commission (Nov 2018) Managing Natura 2000 sites, The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC
- Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities. (Department of the Environment, Heritage and Local Government, 2010).
- Appropriate Assessment under Article 6 of the Habitats Directive: Guidance for Planning Authorities. Circular NPW 1/10 & PSSP 2/10.
- Assessment of Plans and Projects Significantly Affecting Natura 2000 sites: Methodological Guidance on the Provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC (European Commission Environment Directorate-General, 2001). The Guidance within this document provides a non-mandatory methodology for carrying out assessments required under Article 6(3) and (4) of the Habitats Directive.
- Managing Natura 2000 Sites: The Provisions of Article 6 of the Habitats Directive 92/43/EEC (EC Environment Directorate-General, 2000).
- Guidance Document on Article 6(4) of the Habitats Directive 92/43/EEC. Clarification of the Concepts of Alternative Solutions, Imperative Reasons of Over-riding Public Interest, Compensatory Measures, Overall Coherence. Opinion of the European Commission (European Commission, January 2007).

A desk-based review of information sources was completed. Information contained on the websites of the National Parks and Wildlife Service (NPWS)¹ and the National Biodiversity Data Centre (NBDC)² was reviewed.

In addition, the following publications and websites were also reviewed and consulted:

- Ordnance Survey of Ireland mapping and aerial photography available from www.heritagemaps.ie;
- Online data available on European sites as held by the National Parks and Wildlife Service (NPWS) from www.npws.ie;
- Information on water quality and water body mapping in the area available from EPA ENVISION mapping;
<http://maps.epa.ie/internetmapviewer/mapviewer.aspx>
- EPA www.epa.ie/QValue/webusers
- Information on the status of EU protected habitats and species in Ireland (National Parks & Wildlife Service, 2013a and 2013b)³
- Information on Special Conservation Interests for SPAs in Ireland from Irelands Article 12 submission to the EU Commission on the Status and trends of birds species 2008- 2012⁴
- The NPWS site synopsis for Lough Gill SAC (Site Code 001976)
- NRA (2009) Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes, National Roads Authority
- Water Framework Ireland website <http://www.wfdireland.ie/maps.html>
- IFI (2016) Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters, Inland Fisheries Ireland;
- River Basin Management District 2018-2021;
- Natura Impact Statement of the RBMP 2018-2021;
- The National Parks and Wildlife Service (NPWS) website www.npws.ie
- National Biodiversity Data Centre (NBDC) www.NBDC.ie
- Sligo County Development Plan 2017-2023

¹ The National Parks and Wildlife Services map viewer <http://webgis.npws.ie/npwsviewer/>

² The National Biodiversity Data Centre www.NBDC.ie

³ NPWS (2013a). The Status of EU Protected Habitats and Species in Ireland. Species Assessments Volume 2, Version 1.1. Unpublished Report, National Parks & Wildlife Services. Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

NPWS (2013b). The Status of EU Protected Habitats and Species in Ireland. Species Assessments Volume 3, Version 1.0. Unpublished Report, National Parks & Wildlife Services. Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

⁴ NPWS (2015) The Status and trends of Ireland's bird species (2008-2012). Available at <http://www.npws.ie/status-and-trends-ireland%E2%80%99s-bird-species-%E2%80%93-article-12-reporting>

3.0 Methodology

3.1 Field Assessment Methodology

The site was visited for the purposes of identifying habitats onsite on the 24th of October 2021. Habitats were identified and classified according to Fossitt (2000)⁵ and Smith *et al.* (2011)⁶. During the survey, particular attention was given to the possible presence of highly invasive plant species⁷ and habitats or species which are legally protected under Irish or European legislation (Wildlife Acts 1976 to 2018; EU Habitats Directive; EU Birds Directive), or listed on the Flora Protection Order (2015) or Red Data books.^{8, 9} Plant nomenclature follows Parnell and Curtis (2012).¹⁰

Invasive terrestrial plant species listed on S.I. 477 recorded in 10km² G73 are:

- Canadian Waterweed (*Elodea canadensis*)
- Indian Balsam (*Impatiens glandulifera*)
- Japanese Knotweed (*Fallopia japonica*)
- Rhododendron ponticum

3.2 Appropriate Assessment Methodology

3.2.1 Regulatory Context

The Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Flora and Fauna better known as "*The Habitats Directive*" provides the framework for legal protection for habitats and species of European importance. Articles 3 to 9 of the Directive provide the legislative means to protect habitats and species of Community interest through the establishment and conservation of an EU-wide network of sites known as Natura 2000. These are Special Areas of Conservation (SACs) designated under the Habitats Directive and Special Protection Areas (SPAs) designated under the Conservation of Wild Birds Directive (79/409/EEC) (better known as "*The Birds Directive*").

Article 6(3) and 6(4) of the Habitats Directive set out the decision-making tests for plans and projects likely to affect Natura 2000 sites (Annex 1.1). Article 6(3) establishes the requirement for Appropriate Assessment:

⁵ Fossitt, J. (2000). *A Guide to Habitats in Ireland*. The Heritage Council, Kilkenny.

⁶ Smith, G.F., O'Donoghue, P., O'Hora, K. and Delaney, E. (2011) Best practice guidance for habitat survey and mapping. The Heritage Council, Kilkenny.

⁷ Risk of High Impact Invasive Species for Ireland List

http://www.biodiversityireland.ie/wordpress/wp-content/uploads/Invasives_taggedlist_HighImpact_2013RA-1.pdf

⁸ Wyse Jackson, M., FitzPatrick, Ú., Cole, E., Jebb, M., McFerran, D., Sheehy Skeffington, M. & Wright, M. (2016) Ireland Red List No. 10: Vascular Plants. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs, Dublin, Ireland.

⁹ Colhoun, K and Cummins, S (2013) Birds of Conservation Concern in Ireland 2014–2019, *Irish Birds* 9: 523-544.

¹⁰ Parnell, J and Curtis, J. (2012). *Webb's, An Irish Flora*. Cork University Press.

"Any plan or project not directly connected with or necessary to the management of the [Natura 2000] site but likely to have a significant effect thereon, either individually or in combination with other plans and projects, shall be subjected to appropriate assessment of its implications for the site in view of the site's conservation objectives. In light of the conclusions of the assessment of the implication for the site and subject to the provisions of paragraph 4, the component national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public".

Articles 6(3) and 6(4) of the Habitats Directive require an Appropriate Assessment of plans to prevent significant adverse effects on European conservation sites, also known as Natura 2000 sites. In this particular case the purpose of Appropriate Assessment is to assess the potential impacts of the proposed activities on the conservation objectives of European sites. The assessment will determine whether the plan would have significant adverse effects upon the integrity of each site in terms of its nature conservation objectives.

The integrity of the site has been defined as *"the coherence of the site's ecological structure and function, across its whole area, or the habitats, complex of habitats and/or populations of species for which the site is or will be classified"* (PPG 9, UK Department of the Environment, October 1994). Where negative effects are identified other options should be thoroughly examined to avoid any potential damaging effects prior to implementing the plan.

3.2.2 AA Process

The European Commission's Methodological Guidance recommends a 4 stage approach:

Stage 1: Screening

Determining whether the plan 'either alone or in combination with other plans or projects' is likely to have a significant effect on a European site.

Stage 2: Appropriate Assessment

Determining whether, in view of the site's conservation objectives, the plan 'either alone or in combination with other plans or projects' would have an adverse effect (or risk of this) on the integrity of the site. If not, the plan can proceed.

Stage 3: Assessment of Alternative Solutions

Where it has not been proven that measures considered will not avoid or mitigate the adverse effect on the Natura 2000 site, then an assessment of the alternatives will be required; and if none are acceptable then stage 4 is required to be considered.

Stage 4: Assessment where no Alternative Solutions Exist & where Adverse Impacts Remain

This will involve assessment where the Plan is considered to result in adverse impacts on the Natura 2000 site and no alternative solutions remain – the

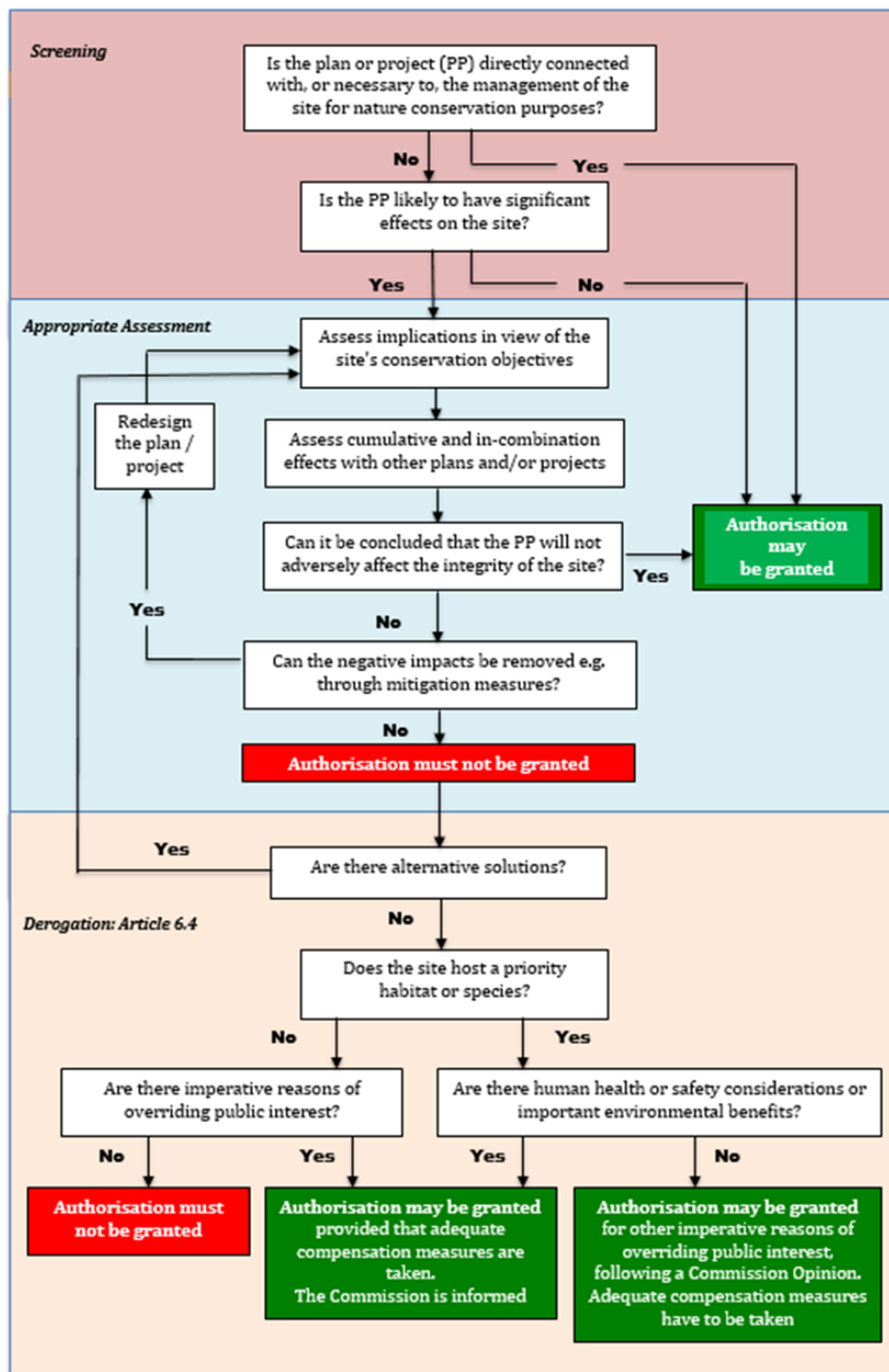
imperative reasons of overriding public interest (IROPI) test must be met before authorisation, permission or adoption of the Plan is agreed. This includes the agreement of compensatory measures. This report covers Stage 1 of Appropriate Assessment - Screening. The outcome of each stage determines whether a further stage in the process is required.

This report comprises a Stage I Screening Report and Stage II Natura Impact Report.

A flow diagram illustrating the various stages of AA are outlined below (EC 2018)¹¹:

¹¹ Figure taken from - European Commission (Nov 2018) Managing Natura 2000 sites, The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC

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4.0 Stage I Appropriate Assessment

4.1 Field Assessment Results

A series of photographic plates are attached in Appendix B. Protected species previously recorded in 10km² grid square G73 within which the site is located, taken from the NBDC website, is attached in Appendix C. None of the protected species listed were noted or invasive species listed on Regs S.I 477.

The main habitat affected by the proposed development will be 'Dry Meadows and Grassy Verges (GS2)' with areas of 'Scrub (WS1)'. Areas of rank, unmown grassland which includes species such as false oat grass, Yorkshire fog, cocksfoot, hogweed, creeping buttercup and meadow buttercup are present along with intermittent patches of gorse scrub. Recent activity by a tracked digger (for trial holes), have created areas of disturbed bare ground (ED2).

Along the field boundaries are mature treelines (WL2) with gappy hedgerow species (WL1). The native treelines have trees present that are classed as having bat potential and should therefore be retained or surveyed if to be felled. There is a treeline of non-native Leylandi also present to the south field boundary separating site from the adjacent property.

Lough Gill is located approx. 250m east of the site. None of the habitats on site are qualifying habitats of the Lough Gill SAC.

A habitat map is shown as Figure 5.

4.2 Source-Pathway-Receptor Approach and Identification of Zone of Influence

In establishing which European sites are potentially at risk (in the absence of mitigation) from the proposed development, a source-pathway-receptor approach was applied. In order for an impact to occur, there must be a risk enabled by having a source (e.g. water abstraction or construction works), a receptor (e.g. a European site or its Qualifying Interest(s) (QIs) or Special Conservation Interest(s) (SCIs) species), and a pathway between the source and the receptor (e.g. pathway by air for air borne pollution, or a pathway by a watercourse for mobilisation of pollution). For an impact to occur, all three elements must exist; the absence or removal of one of the elements means there is no possibility for the impact to occur.

The identification of source-pathway-receptor connection(s) between the proposed development and European sites essentially is the process of identifying which European sites are within the Zone of Influence (Zoi) of the proposed development, and therefore potentially at risk of significant effects. The Zoi is defined as the area within which the proposed development could affect the receiving environment such that it could potentially have significant effects on the QI habitats

or QI/SCI species of a European site, or on the achievement of their conservation objectives (as defined in CIEEM, 2018).

The identification of a source-pathway-receptor risk does not automatically mean that significant effects will arise. The likelihood for significant effects will depend upon the characteristics of the source (e.g. extent and duration of construction works), the characteristics of the pathway (e.g. direction and strength of prevailing winds for air borne pollution) and the characteristics of the receptor (e.g. the sensitivities of the European site and its QIs/SCIs). However, identification of the risk does mean that there is a possibility of ecological or environmental damage occurring, with the significance of the effect depending upon the nature and exposure to the risk and the characteristics of the receptor. In this case, where uncertainty existed, the precautionary principle was applied.

4.3 Description of Relevant Receptor-Source-Pathway Connections between the proposed development site and European sites Identified

In accordance with the European Commission Methodological Guidance (EC2001), a list of Natura 2000 Sites that can be potentially affected by the proposed works has been compiled. Adopting the precautionary principle in identifying these sites, it has been decided to include all SACs (Special Areas of Conservation) and SPAs (Special Protection Areas) within 15km of the site at Aghamore, Co. Sligo.

The nearest protected areas to the site are listed below in Table 1. A map showing the 6 SAC and 4 SPA sites located within a 15km radius of the site are shown as Figures 6 and 7.

Table 1 Natura 2000 Sites within 15km of the Site.

Code	Site Name	Approx. Distance (as the crow flies)	Screening Conclusion
Special Area of Conservation (SAC)			
001976	Lough Gill SAC	250m N, NE, E, SE	Screened in as inside the Zone of Influence with the SAC located approx. 400m from the proposed works to the lake edge (250m to SAC boundary).
000627	Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC	4km NW	Screened out as outside the Zone of Influence - no hydrological connections from the applicant sites to these SAC sites that could lead to impacts affecting water quality. The distances from applicant site to these SACs is sufficient to ensure no disturbance impacts from the proposed works.
000622	Ballysadare Bay SAC	3.8km SW, W	
000638	Union Wood SAC	3.6km SW	
001898	Unshin River SAC	4.1km SW	
000623	Ben Bulbin, Gleniff And Glenade Complex SAC	10.8km N, NE	
Special Protection Area (SPA)			

Code	Site Name	Approx. Distance (as the crow flies)	Screening Conclusion
004129	Ballysadare Bay SPA	3.8km SW	Screened out as outside the Zone of Influence - no hydrological connections from the applicant site to these SPAs that could lead to impacts affecting water quality. The distances from applicant site to these SPAs are sufficient to ensure no disturbance impacts from the proposed works.
004035	Cummeen Strand SPA	4.4km NW	
004187	Sligo/Leitrim Uplands SPA	8.7km N, NE	
004013	Drumcliff Bay SPA	9.2km NW	

The proposed works occur do not occur within a designated site however Lough Gill SAC is located approx. 250m east of the applicant site and is therefore screened in as within the Zone of Influence. All other sites listed in Table 1 are over 3.6km away with no hydrological connections and sufficient distance to rule out disturbance impacts, in this regard these SAC and SPA sites are screened out for potential impacts as they are outside the Zone of Influence. The Site Synopsis for Lough Gill SAC is attached as Appendix D.

5.0 Screening Assessment of Likely Effects

The potential for impact on the features of interest and conservation objectives of Lough Gill SAC are considered below. A number of factors were examined at this stage and dismissed, or carried forward for appropriate assessment if necessary.

5.1 Potential impacts for Lough Gill SAC

5.1.1 Habitat Loss/Alteration

There will be no direct habitat loss of Lough Gill SAC. The area affected by the proposed works is currently Grassy Meadows and Scrub mosaic (GS2/WS1)' and does not correspond to qualifying interests of Lough Gill SAC.

Impacts arising from habitat loss/alteration are screened out.

5.1.2 Disturbance and/or Displacement of Species

Otters (associated with Lough Gill SAC) are species that are typically crepuscular in nature and susceptible to disturbance. Although otters often occur within urban areas and are occasionally observed in such areas during the day (in Sligo Town for example), the most likely impacts on otter relate to potential from noise disturbance (notably during construction) and light disturbance during operational phase of the proposal.

There will be unavoidable levels of noise during the construction phase. Notably, noise levels during any earthworks, and activities for the foundations will result in significant, although localised and temporary, noise levels.

Disturbance and displacement of fauna species as a result of construction related disturbance could potentially occur within the vicinity of the proposed works. For mammal species such as otter and badger, disturbance effects would not be expected to extend beyond 250m¹². For birds, disturbance effects would not be expected to extend beyond a distance of c.300m, as noise levels associated with general construction activities would attenuate to close to background levels.

The proposed works at the nearest point is 250m to Lough Gill SAC. In that regard impacts to qualifying interests of this SAC are ruled out due to the distance and the fact the construction works will be localised and temporary. Impacts to aquatic species i.e. Salmon, Crayfish and Lamprey spp. are screened out given the lake edge is ~400m away from the site.

Disturbance to features of interest of Lough Gill SAC is screened out.

5.1.3 Habitat /Species Fragmentation

Habitat fragmentation has been defined as the 'reduction and isolation of patches of natural environment'¹³ usually due to an external disturbance such that an alteration of the spatial composition of a habitat occurs that alters the habitat and 'create[s] isolated or tenuously connected patches of the original habitat.' This results in spatial separation of habitat units which had previously been in a state of greater continuity.

It is considered that habitat fragmentation to qualifying habitats of Lough Gill SAC will not arise from the proposed works and is therefore screened out.

5.1.4 Changes in Population Density

It is not expected that the proposed works will cause any reduction in the baseline population of any qualifying species of Lough Gill SAC is therefore screened out.

5.1.5 Changes in Water Quality

There is potential risk to water quality during the construction phase of the proposed works as silt and harmful substances become entrained in surface water run-off. Lough Gill SAC is 250m away so may be affected.

¹² This is consistent with Transport Infrastructure Ireland (TII) guidance (Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes and Guidelines for the Treatment of Badgers prior to the Construction of National Road Schemes) documents. This is a precautionary distance, and likely to be moderated by the screening effect provided by surrounding vegetation and buildings, with the actual Zol of construction related disturbance likely to be much less in reality.

¹³ Franklin, A. N. (2002). What is Habitat Fragmentation? *Studies in Avian Biology*, 20-29.

During earthmoving and construction works waste-water/foul effluent will be managed at a temporary site compound (e.g. site portaloos and welfare units) with all waste removed from site by licenced waste disposal. Therefore, no potential hydrological link from waste-water/effluent during the construction phase is relevant.

An EPA approved Waste Water Treatment System and Percolation Area is planned to treat foul water during the operational phase. The system will be serviced and maintained annually with a contract in place.

Contaminated surface water runoff leaving the site may result in contamination events and therefore this impact is screened in.

5.2 Screening Statement Conclusions

According to NPWS (2009), the Appropriate Assessment Screening exercise can either identify that an Appropriate Assessment is not required; or that there is no potential for significant effects (i.e. Appropriate Assessment is not required); or that significant effects are certain, likely or uncertain (i.e. the project must either proceed to Stage 2 (AA) or be rejected).

The site of the proposed development is within a 15km radius of four Natura 2000 sites. It has been determined during the screening process that nine of these sites will not be impacted:

- Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC
- Ballysadare Bay SAC
- Union Wood SAC
- Unshin River SAC
- Ben Bulbin, Gleniff And Glenade Complex SAC
- Ballysadare Bay SPA
- Cummeen Strand SPA
- Sligo/Leitrim Uplands SPA
- Drumcliff Bay SPA

The remaining site, Lough Gill SAC, located approx. 250m from the site works may potentially be impacted during the construction of the proposed development by water quality impacts (both surface and groundwater) due to the drainage network on the site towards Carns Stream, which flows to Lough Gill, during the construction phase.

A Natura Impact Statement (NIS) is therefore required in order to assess the significance of the potential impacts. The NIS is presented in Section 4 of this report.

6.0 Natura Impact Statement

Based on the results of the screening assessment (Section 3) a Natura Impact Statement (NIS) is required to assist Sligo County Council undertake an Appropriate Assessment. This NIS concludes the findings of a Natura Impact Assessment (NIA).

6.1 Stages of Natura Impact Assessment

The stages of the Natura Impact Assessment are broadly in line with those required for an Appropriate Assessment in accordance with the European Commission Methodological Guidance on the provision of Article 6(3) and 6(4) of the 'Habitats' Directive 92/43/EEC (EC 2001) and the European Commission Guidance 'Managing Natura 2000 Sites'.

In complying with the obligations under Article 6 and following the above Guidelines, this NIA has been structured in a stage by stage approach outlined in Table 2.

Table 2 Stages of Natura Impact Assessment (NIA)

Stages of the NIA	Description of Requirements in accordance with Article 6
Stages 1 & 2	Identification of the location and compilation of the information required regarding the Natura 2000 sites and the qualifying interests and conservation objectives for the sites.
Stage 3	Undertake an assessment of likely significant effects. As part of Stage 3 it is required to provide the following: <ul style="list-style-type: none"> • Description of the project. • Identification of the main features of the proposed project, (scale and size, physical changes that will result from the project).
Stage 4	Assessment of 'in combination effects'. These include <i>ex situ</i> and <i>in situ</i> projects/developments.
Stage 5	Conclusion as to whether or not the project may give rise to significant effects.

The Habitats Directive promotes a hierarchy of avoidance, mitigation and compensatory measures. First the project should aim to avoid any negative impacts on European sites by identifying possible impacts early in the planning stage, and designing the project in order to avoid such impacts. Second, mitigation measures should be applied, if necessary, during the NIA process to the point, where no adverse impacts on the site(s) remain. If the project is still likely to result in adverse effects, and no further practicable mitigation is possible, then it is rejected. If no alternative solutions are identified and the project is required for imperative reasons of overriding public interest (IROPI test) under Article 6 (4) of the Habitats Directive, then compensation measures are required for any remaining adverse effect.

6.2 Stages 1 & 2 of Natural Impact Assessment

This stage of the NIA identifies and provides information regarding the Natura 2000 site, Lough Gill SAC, selected for the NIA and the features of interest and conservation objectives for this site.

6.3 Lough Gill SAC (Site Code: 001976)

This European Site includes Lough Gill, Doon Lough to the north-east, the Bonet River (as far as, but not including, Glenade Lough), and a stretch of the Owenmore River near Manorhamilton in Co. Leitrim. Lough Gill itself, 2 km east of Sligo town via the Garavogue River, lies at a geological junction of ancient metamorphic rocks which produce acid groundwater, and limestone which dissolves in the groundwater (from Site Synopsis, Appendix C). Qualifying Interests of SAC Lough Gill SAC is designated for importance for three habitats listed on Annex I of the EU Habitats Directive, one of which has priority status* (meaning habitats which are in danger of disappearing within EU territory) and six Annex II species. The qualifying interests are as follows:

- Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation [3150]
- Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210]
- Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0]
- *Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae) [91E0]
- *Austropotamobius pallipes* (White-clawed Crayfish) [1092]
- *Petromyzon marinus* (Sea Lamprey) [1095]
- *Lampetra planeri* (Brook Lamprey) [1096]
- *Lampetra fluviatilis* (River Lamprey) [1099]
- *Salmo salar* (Salmon) [1106]
- *Lutra lutra* (Otter) [1355]

Conservation Objectives for the Qualifying Interests of SAC (NPWS, 2020):

To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected: Favourable conservation status of a habitat is achieved when:

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

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

Table 3 below lists the features of interest for Lough Gill SAC significance of Impact Matrix.

Table 3 Significance of Impact Matrix – Lough Gill SAC (001976)

European Site and connectivity	Features of Interest	Potential impact / cause	Potential for significant effects?
	<p><i>Qualifying Interests (QI's)</i></p> <p><i>Special Conservation Interests (SCI:s)</i></p> <p>* = A priority habitat – habitats which are in danger of disappearing within the EU territory, are highlighted with an asterisk.</p>		
Proposal lies within 250m of Lough Gill SAC.	Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation [3150]	The site specific conservation objectives and associated mapping were reviewed to inform this assessment.	Yes – Potential for Significant Effect though unlikely, cannot be ruled out.
	Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, <i>Alnion incanae</i> , <i>Salicion albae</i>) * [91E0]	A potential pathway for surface/groundwater connectivity with the SAC has been identified.	
	<i>Austropotamobius pallipes</i> (White- clawed Crayfish) [1092]	Therefore taking a precautionary approach a potential pathway for deterioration of surface water affecting the Annex I habitat/supporting habitat of QI species has been identified on a precautionary basis. The potential for impact on these QIs is therefore considered further in this document.	
	<i>Petromyzon marinus</i> (Sea Lamprey) [1095] <i>Lampetra planeri</i> (Brook Lamprey) [1096] <i>Lampetra fluviatilis</i> (River Lamprey) [1099]		
	<i>Salmo salar</i> (Salmon) [1106]	Potential for toxicity impacts hydrocarbon / chemical / silt pollution during construction, or operational pollution event.	

	<i>Lutra lutra</i> (Otter) [1355]	Potential for toxicity impacts hydrocarbon / chemical / silt pollution during construction, or operational pollution event.	
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6.4 Conservation Objectives of Lough Gill SAC

Conservation objectives were set for SAC 001976 in July 2012,¹⁴ and have been summarised in Table 7. The overall aim of the Habitats Directive is to maintain favourable conservation status of the Annex I habitats and the Annex II species for which the *Lough Gill* SAC has been selected.

It is deemed there are no features of interest of the *Lough Gill* SAC occurring within the site of the proposed development.

Table 4 shows Conservation Objectives of the Lough Gill SAC.

Table 4 Conservation Objectives for Potentially Affected Sites

Objectives for Lough Gill SAC	
Objective 1	To maintain the Annex I habitats for which the SAC has been selected at favourable conservation status.
Objective 2	To maintain the Annex II species for which the SAC has been selected at favourable conservation status.
Objective 3	To maintain the extent, species richness and biodiversity of the entire site
Objective 4	To establish effective liaison and co-operation with landowners, legal users and relevant authorities.

Table 5 sets out the main threats and impacts to the qualifying habitats and species of Lough Gill SAC as per the NPWS Natura 2000 form.

¹⁴ NPWS (2021) NPWS (2021) Conservation Objectives: Lough Gill SAC 001976. Version 1. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage

Table 5 Potential Pressures and Threats on Annex I Habitats in Lough Gill SAC

Negative Impacts			
Rank	Threats and pressures [code]		Inside/outside/both [a] o [b]
M	B06	grazing in forests/ woodland	I
L	J02.05.02	modifying structures of inland water courses	I
M	A10.01	removal of hedges and copses or scrub	I
M	E01.03	dispersed habitation	I
M	D01.01	paths, tracks, cycling tracks	I
L	B	Sylviculture, forestry	I
H	E01.01	continuous urbanisation	B
L	J02.10	management of aquatic and bank vegetation for drainage purposes	I
L	G01.01.01	motorized nautical sports	I
L	E03.03	disposal of inert materials	I
M	I01	invasive non-native species	I

6.5 Water Framework Directive

The Water Framework Directive (WFD) is a key initiative aimed at improving water quality throughout the EU. It applies to rivers, lakes, groundwater, coastal & transitional waters. The Directive requires an integrated approach to managing water quality on a river basin basis; with the aim of maintaining and improving water quality. The Directive requires that management plans be prepared on a river basin basis and specifies a structured approach to developing those plans. It requires that a programme of measures for improving water quality be brought into effect.

Specifically, the WFD aims to protect/enhance all waters (surface, ground and coastal waters), achieve "good status" for all waters, manage water bodies based on river basins (or catchments), involve the public and streamline legislation.

The EPA maps¹⁵ were consulted for the drainage of the area in respect of waterbodies in the locality and their 2013-2018 Water Framework Directive (WFD) waterbody status (see Figure 4). There are no streams or drainage ditches near the affected areas of the applicant connecting it to Special Areas of Conservation (SACs) or Special Protection Areas (SPAs); specifically Lough Gill SAC located

¹⁵ <https://gis.epa.ie/EPAMaps/>

approx. 250m east of the site. The site is located within the Sligo Bay & Drowse Catchment (HA 35).

The Water framework Directive (WFD) gave the following results for the WFD Sub-Catchment 'Bonet_SC_030' within which the site is located:

- 2013-2018 WFD Groundwater Body Status of 'Carrowmore East' is 'Good' but Risk Status is 'At Risk'
- 2013-2018 WFD Riverbody Status of 'GARAVOGUE_010' is 'Poor' and Risk Status is 'At Risk'
- 2013-2018 WFD Lake Waterbody Status of 'Gill SO/Lough Gill' is 'Moderate' and Risk Status is 'At Risk'

6.5 Stage 3: Assessment of Likely Significant Effects

The potential impacts to the conservation interests of Lough Gill SAC from the proposed development are listed below:

1. Negative impacts to water quality e.g. a pollution event involving release of suspended solids during construction phase which may make its way into the drainage system from the site via surface water run-off. This may impact species associated with the Lough Gill SAC.
2. Water quality contamination of ground water during the operational phase due to foul water.
3. Introduction of invasive species e.g. via construction materials or machinery which may spread to Lough Gill SAC 250m NE of the site.

Mitigation outlined in Section 6.7 will be implemented to prevent these impacts.

6.6 Stage 4: In Combination Effects of Plans & Projects

The Habitats Directive requires that due consideration needs to be given to any plan or project which is likely to have a significant effect alone or in combination with other plans and projects. As all potential negative impacts to Natura 2000 sites have been screened out, there cannot be in-combination effects with other plans or projects. The proposal alone does not have a significant effect on listed habitats or species as detailed above.

The Sligo County Development Plan in complying with the requirements of the Habitats Directive requires that all Projects and Plans, that could affect the Natura 2000 sites in Sligo, would be initially screened for Appropriate Assessment and if requiring Stage 2 AA, that appropriate employable mitigation measures would be put in place to avoid, reduce or ameliorate negative impacts. In this way any in-combination impacts with plans or projects for the area of Aghamore, Co. Sligo, would be avoided.

Any new applications for the project areas will be assessed on a case by case basis by Sligo County Council which will determine the requirement for AA as per the requirements of Article 6(3) of the Habitats Directive. Similar mitigation measures would be imposed for other projects as for this Natura Impact Statement, and therefore this will ensure that no significant cumulative/in-combination impacts will occur.

In-combination effects may arise from the development of other projects in the vicinity of the site, such as construction of housing, roads, rail, water and wastewater infrastructure, gas, electricity, provision of tourism facilities and telecommunications infrastructure, however, the in-combination effects of other developments would depend on factors such as the distance in relation to the site, the scale and the characteristics e.g. the types and quantities of emissions.

In the past 5 years there have been a total of 4 finalised planning applications (excluding the current application) with planning granted with 'Aghamore' in the

address to SCC. Three of these (13131, 17322 & 21482) were all small one-off projects and unlikely to cause cumulative impacts with the current application. The fourth (18345) was for continued quarry operations.

6.7 Mitigation

6.7.1 Disturbance

The construction works involved will be localised in nature and not reach excessive levels. This means that any potential disturbance would be temporary and short-term, and as a result it is considered that there will be no significant disturbance and/or displacement of species caused as a result of the proposed development.

Building works will take place during normal daytime hours. Environmental noise arising from activities on the construction site shall be controlled in accordance with the requirements of BS5228. The following noise control measures shall be implemented by all contractors:

- All contractors will ensure that the plant and construction methods employed are the quietest available for the required purpose insofar as practicable.
- Equipment and vehicles to be shut down when not in use.
- normal construction work noise limits and working hours will be in place with reference to the recent DEFRA noise guidelines¹⁶

The native treelines (WL2) around the site (except to the east where there is a Leylandi treeline) contain bat potential trees and should be retained. Additional supplementary planting using 5+ native hedging species will also be done on the other site boundaries giving a net positive impact for biodiversity. Teagasc hedge planting advice, along with native trees planting lists and pollinator friendly planting advice is attached as Appendix E.

Bat boxes and bird boxes should be erected around the site during the operational phase to increase bird nesting and bat roosting opportunities.

¹⁶ Radford et al (2019) The Effects of Noise on Biodiversity (NO0235) - Final Report for Defra, University of Bristol

6.7.2 Introduction/Spread of Invasive Species

The intended construction methodology shall contain measures for avoiding the introduction and spread of non-native invasive species and will follow best practice guidance documents. The control measures shall be in accordance with the "Guidelines on the Management of Noxious Weeds and Non-native Invasive Plant Species on National Roads" (NRA, 2008).¹⁷ The measures outlined in the 'Horticulture Code of Good Practice'¹⁸ and the 'IFI Biosecurity Protocol for Field Survey Work'¹⁹ should be adhered to for example high-pressure steam cleaning, with water > 40°C for machinery and sprayed with Virkon™ antiseptic.

Machinery will have the wheels power washed/disinfected prior to and before leaving the site so as to prevent the entry of alien invasive weeds to the site e.g. Japanese knotweed.

Guidelines referring to invasive species will be taken into consideration whilst carrying out the proposed development - available on the *Invasive Species Ireland* website.²⁰

Quarries supplying material for the project should be able to give written confirmation to the client that material from their depot is free of non-native invasive species and noxious weeds.

6.7.3 Water Quality

6.7.3.1 Construction Phase

As part of standard practice, appropriate mitigation measures to prevent water pollution will be implemented during all of the construction phases and will include referral to CIRIA (Construction Industry Research and Information Association) Publications including C532 – *Control of Water Pollution from Construction, Guidance for Consultants and Contractors*. These measures include the release of suspended solids and contaminants (e.g. cement and oil) during construction and are listed:

Reduction & Prevention of Suspended Solids Pollution

Inland Fisheries Ireland (2016)²¹ guidelines will be followed by the contractor. Release of suspended solids will be kept to a minimum. The key factors in erosion

¹⁷ <http://www.tii.ie/technical-services/environment/construction/Management-of-Noxious-Weeds-and-Non-Native-Invasive-Plant-Species-on-National-Road-Schemes.pdf>

¹⁸ Kelly, J. 2012. Horticulture code of good practice to prevent the introduction and spread of invasive non-native species. V2.0. Prepared as part of Invasive Species Ireland.

¹⁹ IFI (2010) *IFI Biosecurity Protocol for Field Survey Work*. Inland Fisheries Ireland.

²⁰ www.invasivespecies.com

²¹ IFI (2016) *Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters*, Inland Fisheries Ireland

and sediment control are to intercept and manage on-site runoff. This limits the potential for soils to be eroded and enter any watercourses (if present) in runoff.

The following mitigation measures will be adhered to:

- Existing vegetation onsite will be retained except for the footprint of building works.
- Existing hedgerows and treelines will be retained except for sightlines.
- There will be no site works during extreme wet weather conditions.
- The extent of ground required for building works will have the minimum ground cover stripped where possible, and it will be stripped on a phased basis to minimise the area of soil exposed at any one time.
- Eroded sediments will be retained on site using a silt fence and hay bale barrier described later
- Temporary stockpiled material will be located onsite and will be covered to prevent run-off.

Reduction or Elimination of Pollution from other Substances

The following guidelines, based on the IFI guidelines (2016), Chilibeck *et al* (1992)²², and NRA (2005)²³ will be followed by the contractor:

- Raw or uncured waste concrete will be removed from the construction site and disposed of in accordance with the relevant waste management legislation.
- Wash down water from concrete trucks, cast in place concrete etc. will be collected in a suitable containment structure and then taken off-site for appropriate disposal.
- Fuels, lubricants and hydraulic fluids for equipment used in the construction site will be carefully handled to avoid spillage, properly secured against unauthorised access or vandalism, and provided with spill containment according to current best practice²⁴.
- Fuelling and lubrication of equipment will be carried out offsite or in bunded areas.

²² Chilibeck, B., G. Chislett, and G. Norris (1992) Land development guidelines for the protection of aquatic habitat. Department of Fisheries and Oceans, Canada. Habitat management division. Ministry of Environment Lands and Parks. Integrated Management Branch

²³ National Roads Authority (2005) Guidelines for the crossing of watercourses during construction of national road schemes. National Roads Authority.

²⁴ Enterprise Ireland (2012) Best Practice Guide (BPGCS005) Oil storage guidelines.

- Appropriate spill control equipment, including oil booms and oil soakage pads, will be kept within the construction site to deal with any accidental spillage.
- Any spillage of fuels, lubricants or hydraulic oils will be immediately contained and the contaminated soil removed from the construction site and disposed of in accordance with all relevant waste management legislation.
- Prior to any work commencing all construction equipment will be checked to ensure that it is mechanically sound, to avoid leaks of oil, fuel, hydraulic fluids and grease.
- Measures will be implemented to minimise waste and ensure correct handling storage and disposal of waste.
- Emergency response procedures will be put in place.

Surface Water Specific Mitigation

The additional surface water run-off, due to the proposed works, has the ability to flow offsite via drainage channels. This may have a negative impact on water quality however with the following in place any silt and/or pollutants will be contained.

Silt fencing and hay bale barriers are two types of sediment barriers. They are temporary structures that are installed across or at the toe of a slope. They are used to control sheet flow - a very thin film of water. They are not suitable for use in areas of concentrated flows such as ditches or waterways.

Although silt fencing and hay bale barriers are considered interchangeable, in reality they perform very differently in the field. Silt fencing is much better at filtering fine soil particles out of dirty water, much as a coffee filter holds back ground coffee from the pot. They are not very sturdy when compared to hay bales, and heavy machinery can readily run them over rendering them useless.

Hay bale barriers do a poorer job at filtering dirty water. They are however, readily available. Once they are installed properly, they are very resistant to being moved.

Fine textured sediment (fine sands, silts or clays) are best contained using a silt fence.

A hay bale barrier is better suited for coarse and sandy soils/run-off.

In that regard this project will use both, a silt fence (see Appendix F) for specification required) which will be reinforced with the sturdy structure of hay bales to give the best filtering ability, see Figure 3.

Installing a Hay Bale Barrier

- Dig a trench the width of the bales and 4 inches deep.
- Place the bales in a row with the ends tightly together. The bales will be embedded. Gaps between bales should be chinked with straw to prevent water from escaping from between them.
- Drive stakes or re-bars through the bales (two per bale). The first stake in each bale should be angled toward the previously laid bale to force the two bales together.
- Sprinkle loose hay over the area immediately uphill from the barrier. This will increase barrier efficiency.

Installing a Silt Fence

These instructions are general. Follow the manufacturer's instructions if they are available.

- Dig a trench about 4 inches wide and 4 inches deep across the slopes where you wish to install the fencing.
- Place the base of the silt fencing in the trench. Be sure that the posts are positioned on the down-slope side.
- Backfill the trench being sure to compact the soil over the base of the silt fence.
- If fabric with support fence (wire or plastic) is used, posts should be spaced 10 feet apart at the most. If no support fence is used, the spacing should be reduced to 6 feet apart. Posts should be driven at least a foot into the ground.
- Silt fencing should be no higher than 3 feet.
- If you have to join two pieces of silt fencing, splice the fabric at a support post and overlap the fabric a minimum of 6 inches. Seal it as securely as possible.
- An Irish supplier can be found here: <http://ssienviromental.ie/product/silt-fence/>.

Sediment barrier maintenance

- Inspect barriers after each rainfall and repair any damage.
- Remove sediment deposits once they reach 1/2 the height of the barrier. Dispose of the sediment wisely (in a location far away from sensitive areas on the property).
- Replace sections of the barrier that decompose or no longer filter properly.

6.7.3.2 Operational Phase

Groundwater

The 'Site Suitability Report' that accompanies this planning application found the site to be suitable for a packaged waste water treatment system (WWTS) with polishing filter. This WWTS will conform to EPA standards set out in the guidance set out in 'The Code of Practice Wastewater Treatment and Disposal Systems Serving Single Houses' published in 2021' and be serviced annually. Water supply will be a new connection to the public mains. Surface water run-off will be to a proposed soakpit. There are no streams or drainage ditches onsite.

With the measures listed in place to prevent contaminated surface water run-off, a decline in water quality to the surface water and ground water during the construction and operation phase of the proposed works is not expected, significant or otherwise, to have negative direct or indirect impacts, to the drainage system on the site which may flow to Lough Gill SAC approx. 250m east of the site.

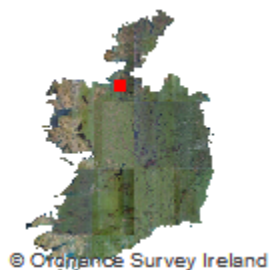
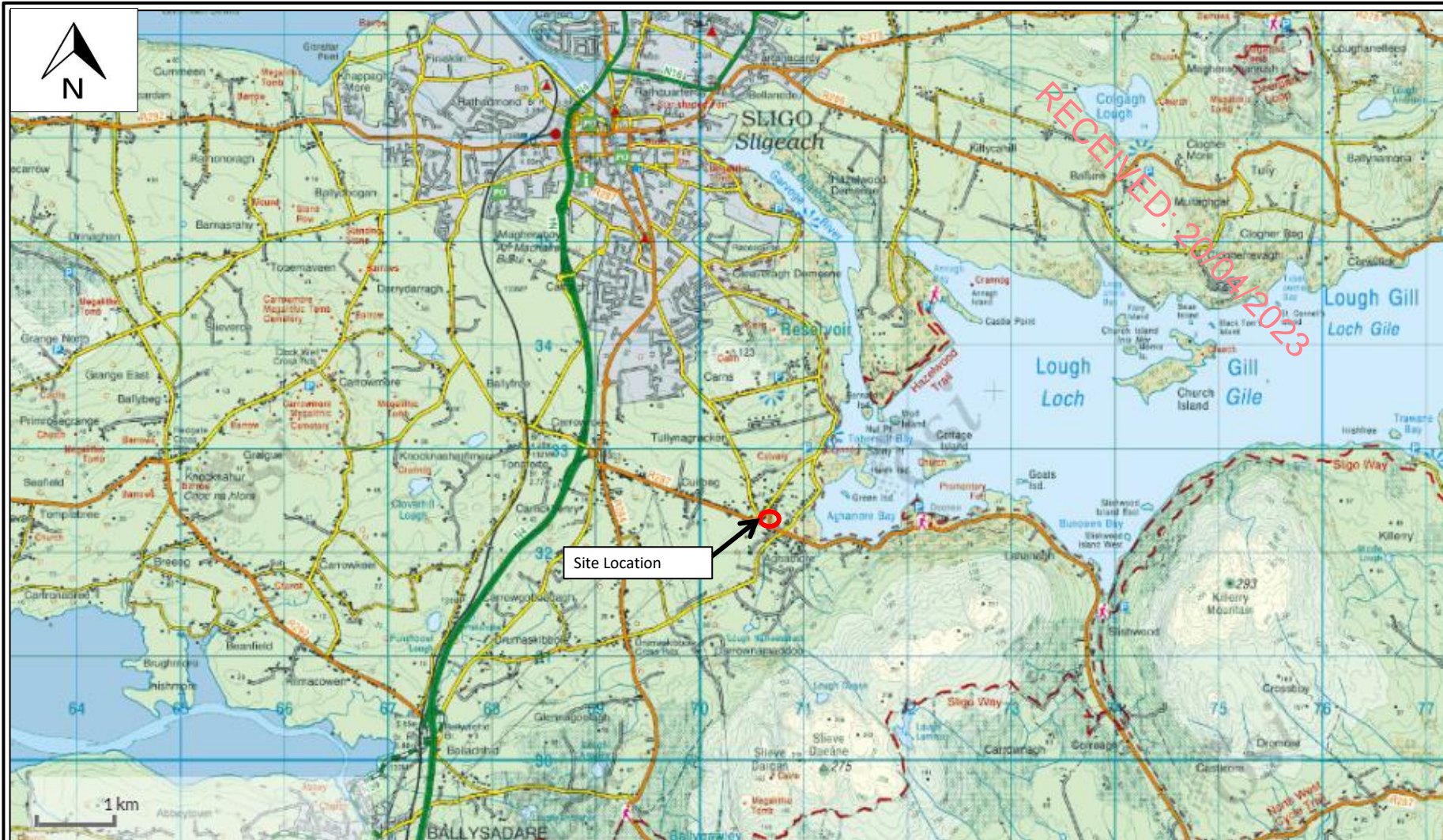
6.8 Stage 5: Conclusion of Natura Impact Assessment

Due to the potential for impacts upon the *Lough Gill* SAC an Appropriate Assessment of the impacts of the proposed development, on its own or in combination with other plans or projects, was required. As a result of the proposed mitigation measures, this Natura Impact Statement is able to conclude that the proposed development will not result in impacts on the integrity of:

- Lough Gill SAC
- Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC
- Ballysadare Bay SAC
- Union Wood SAC
- Unshin River SAC
- Ben Bulbin, Gleniff And Glenade Complex SAC
- Ballysadare Bay SPA
- Cummeen Strand SPA
- Sligo/Leitrim Uplands SPA
- Drumcliff Bay SPA

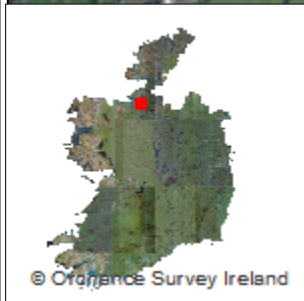
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FIGURES



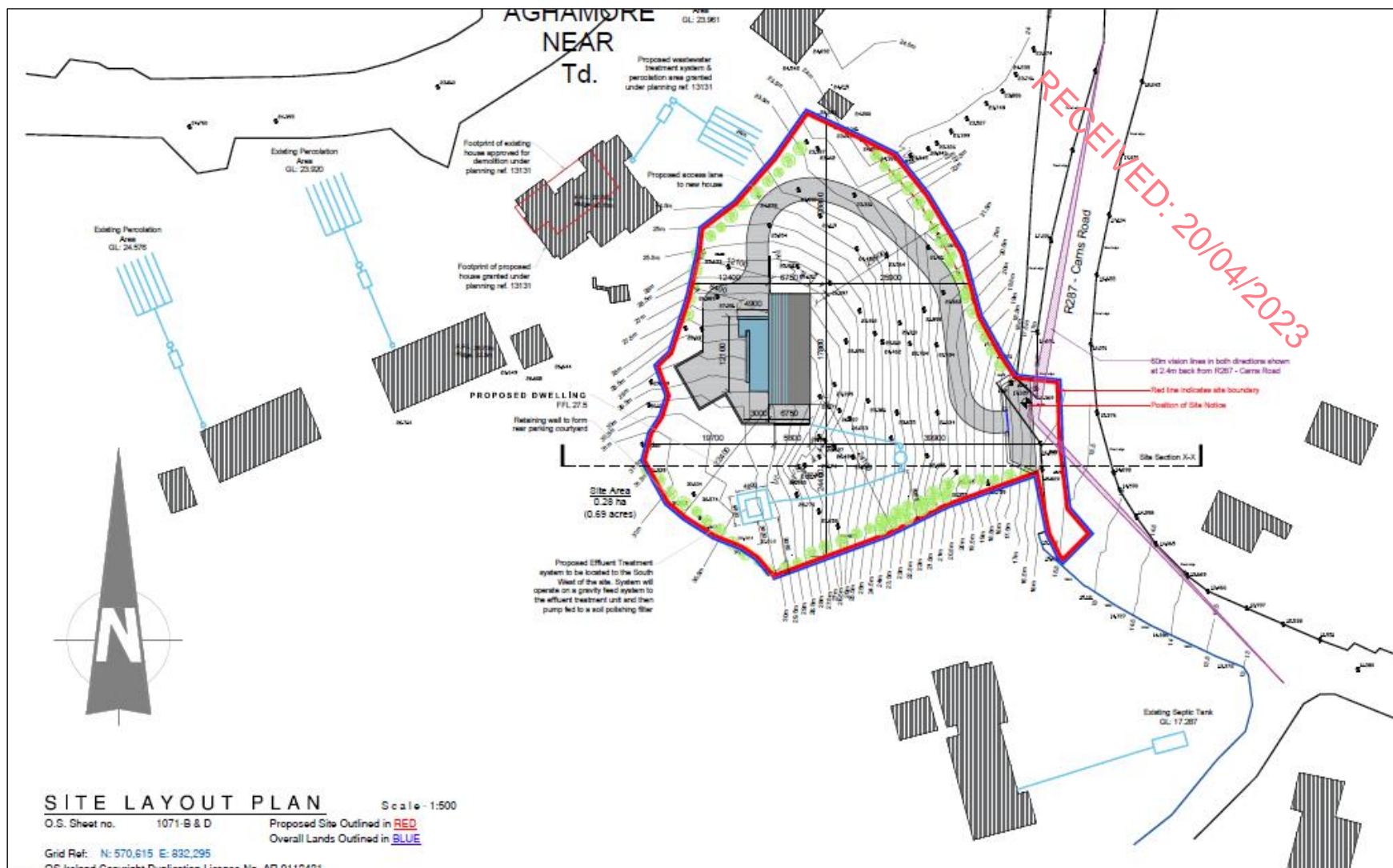
Map sourced from National Biodiversity Data Centre Website – www.nbdc.ie

Client Colm Burns		Drawing Site location map			
Job NIS Report					
Drawing Number Figure 1	Status Final	Sht. Size A4	Scale As Shown	Date Jun 22	Drawn AW

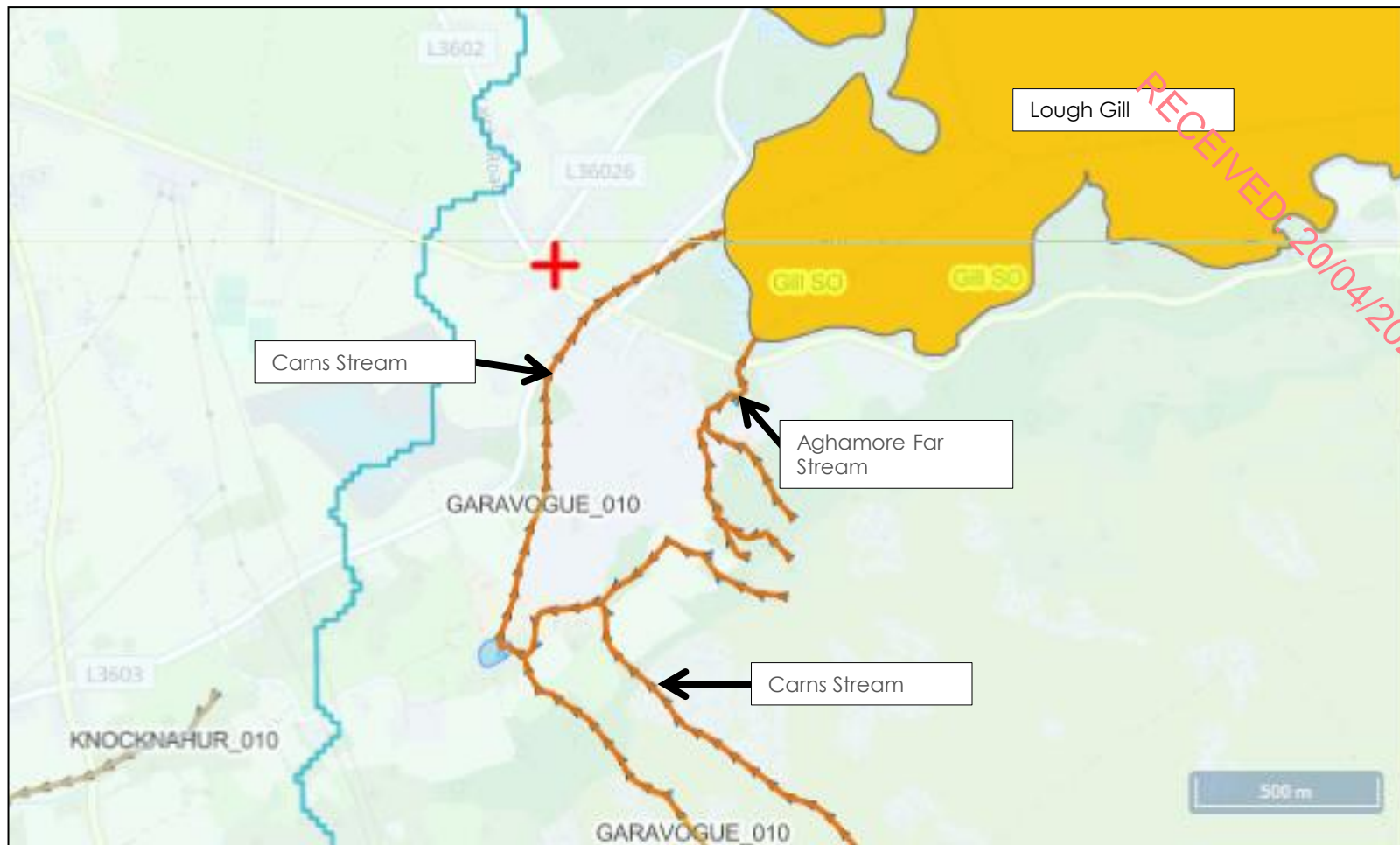


Lough Gill Special Area of Conservation

Colm Burns			Drawing			
Job	NIS Report		Aerial Map			
	Figure 2	Status Final	Sht. Size A4	Scale As Shown	Jun 22	Figure 2



Client Colm Burns		Drawing Proposed Site Layout			
Job NIS Report					
Drawing Number Figure 3	Status Final	Sht. Size A4	Scale As Shown	Date Jun 22	Drawn AW



Map sourced from EPA Maps <https://gis.epa.ie/EPAMaps/>



Approx. Site location - site is located within the Sligo Bay & Drowse Catchment (HA 35).

The Water framework Directive (WFD) gave the following results for the WFD Sub-Catchment 'Bonet_SC_030' within which the site is located:

2013-2018 WFD Groundwater Body Status of 'Carrowmore East' is 'Good' but Risk Status is 'At Risk'

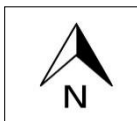
2013-2018 WFD Riverbody Status of 'GARAVOGUE_010' is 'Poor' and Risk Status is 'At Risk'

2013-2018 WFD Lake Waterbody Status of 'Gill SO' is 'Moderate' and Risk Status is 'At Risk'

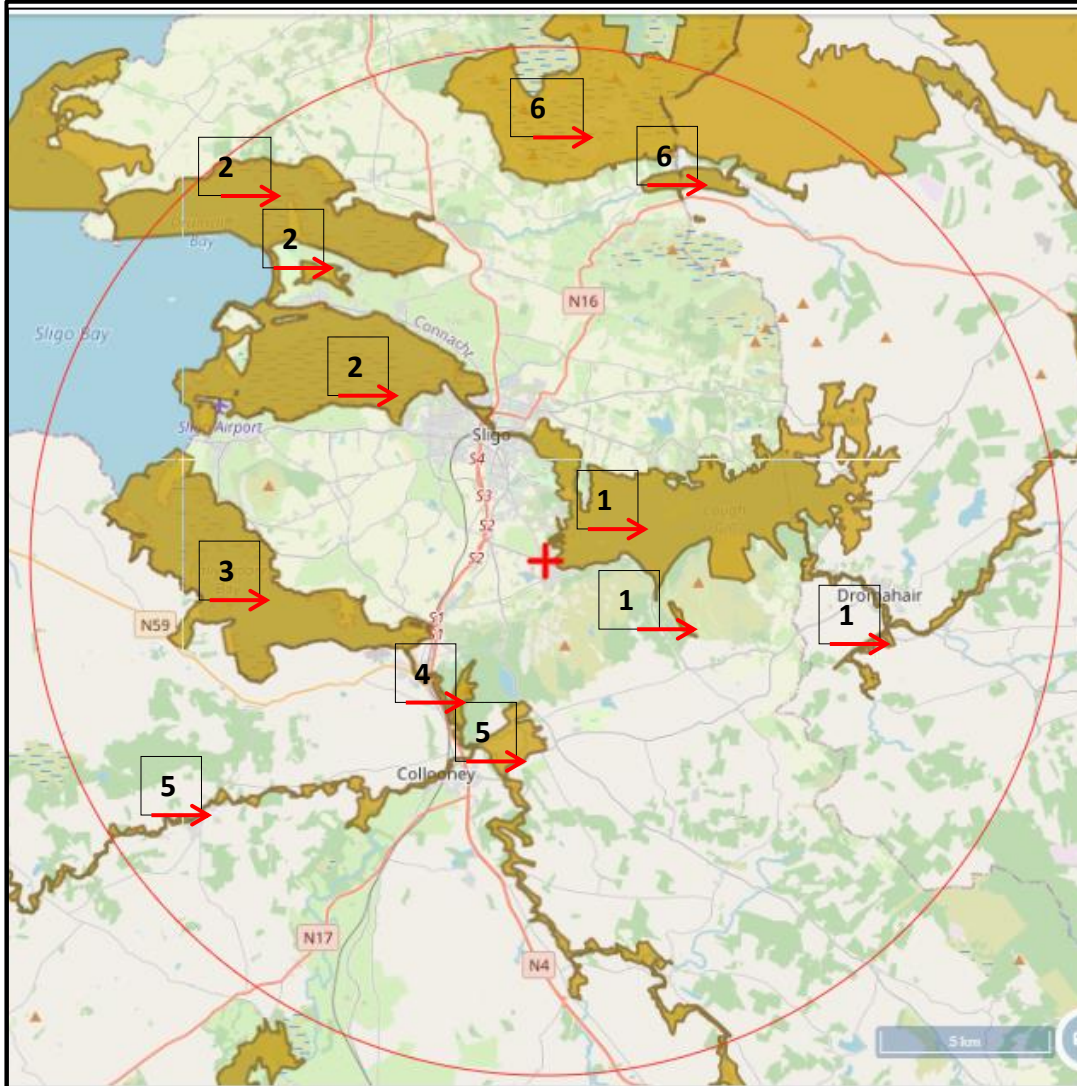
Client		Colm Burns		Drawing		
Job		NIS Report		Water Quality Data		
Drawing Number	Status	Sht. Size	Scale	Date	Drawn	
Figure 4	Final	A4	As Shown	Jun 22	AW	



- Approx. Site Boundary
- Grassy Meadows & Scrub Mosaic (GA2/WS1)
- Disturbed Ground (ED2)
- Native Treeline and gappy hedgerow Spp. (WL1/WL2)
- Non-Native Leylandi Treeline (WL1)



Client		Colm Burns		Drawing	
Job		NIS Report		Habitat Map	
Drawing Number	Status	Sht. Size	Scale	Date	Drawn
Figure 5	Final	A4	As Shown	Jun 22	AW



No.	Site Code	Name	Distance
1	001976	Lough Gill SAC	250m N, NE, E, SE
2	000627	Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC	4km NW
3	000622	Ballysadare Bay SAC	3.8km SW, W
4	000638	Union Wood SAC	3.6km SW
5	001898	Unshin River SAC	4.1km SW
6	000623	Ben Bulbin, Gleniff And Glenade Complex SAC	10.8km N, NE



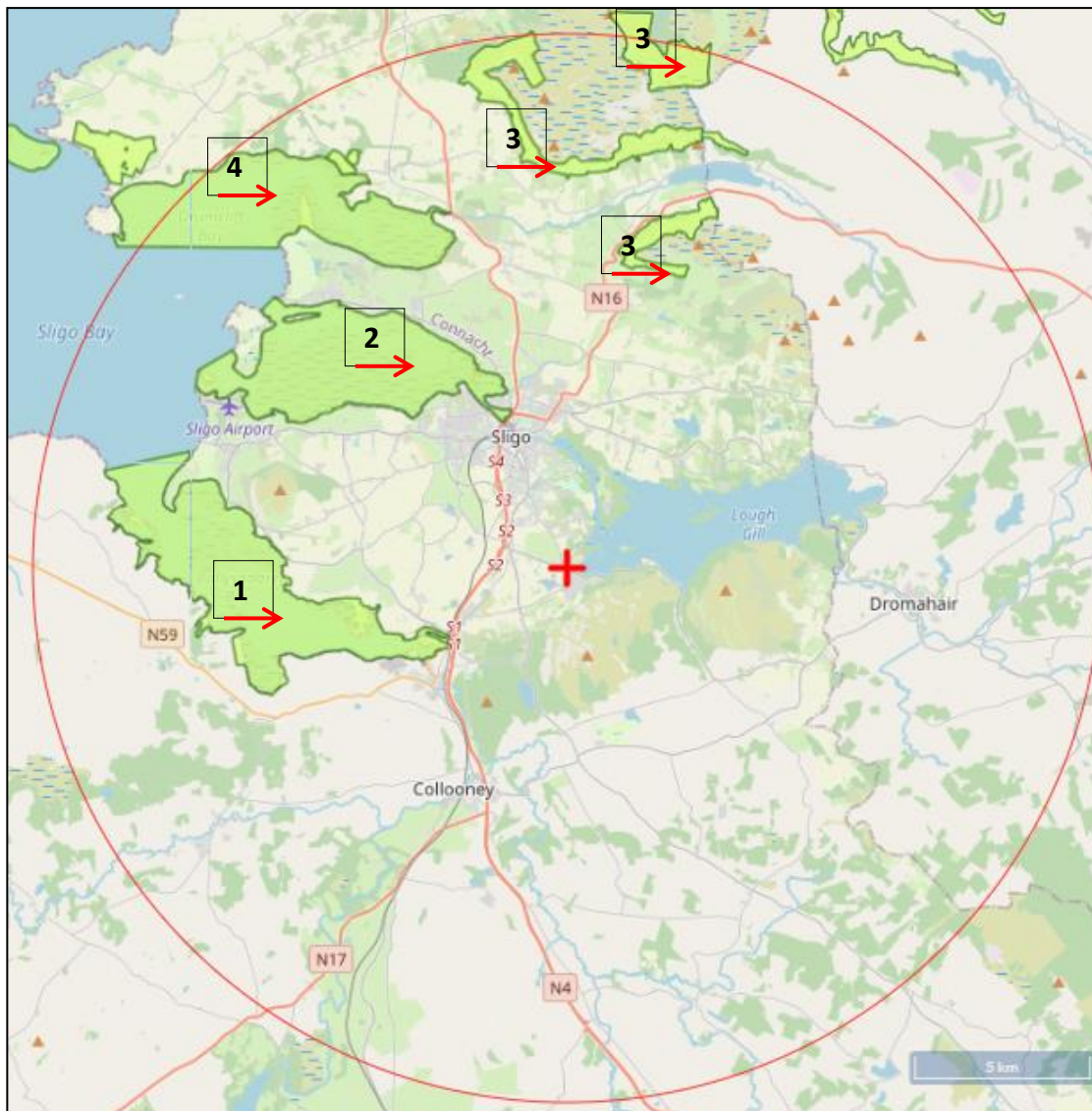
Special Area of Conservation



Site Location



Client Colm Burns		Drawing				
Job NIS Report		Special Areas of Conservation (SACs) within 15km of Site				
Drawing Number Figure 6	Status Final	Sht. Size A4	Scale As Shown	Date Jun 22	Drawn AW	



Special Protection Area



Site Location



No.	Site Code	Name	Distance
1	004129	Ballysadare Bay SPA	3.8km SW
2	004035	Cummeen Strand SPA	4.4km NW
3	004187	Sligo/Leitrim Uplands SPA	8.7km N, NE
4	004013	Drumcliff Bay SPA	9.2km NW

Client Colm Burns		Drawing Special Protection Areas (SPAs) within 15km of Site			
Job NIS Report					
Drawing Number Figure 7	Status Final	Sht. Size A4	Scale As Shown	Date Jun 22	Drawn AW

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APPENDICES

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APPENDIX A



Chartered
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Environmental
Management

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Registered Practices Certificate

April 2022 – March 2023

Pioneer Environment Group Ltd

has been admitted as a Registered Practice

of the

Chartered Institute of Ecology
and Environmental Management

on the 17th day of March 2022

Richard Handley CEng MCIEEM
President

17th March 2022

This certificate remains the property of CIEEM. Membership is subject to annual renewal and may be authenticated by contacting CIEEM at the registered address. Company no. RC000861. Registered Charity Number (England and Wales): 1189915. Registered address: Grosvenor Court, Ampfield Hill, Ampfield, Romsey, SO51 9BD United Kingdom.

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APPENDIX B



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Plates 1 Tracks of digger access for trial holes creating bare ground (ED2). Site of rank grassland (Grassy meadows) and intermittent gorse scrub (GS2/WS1).



Plate 2 Leylandi Trees (WL2) on adjacent property.



Plates 3 Site on a slope overlooking Lough Gill SAC in distance.

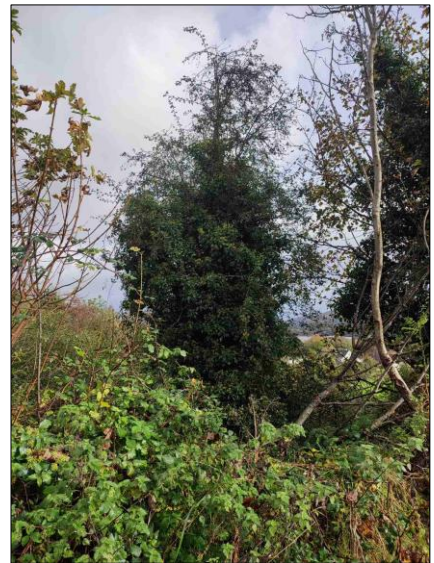


Plate 4 Treeline (WL2) with bat potential to the east boundary near entrance.



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Plate 5 Treeline (WL2) to the west of site, with bat potential, should be retained.



Plates 6/7/8 Bat potential trees near site entrance to the east. Should be retained for biodiversity.

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APPENDIX C

Species group	Species name	Date of last record	Designation
amphibian	Common Frog (<i>Rana temporaria</i>)	10/05/2020	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex V Protected Species: Wildlife Acts
amphibian	Smooth Newt (<i>Lissotriton vulgaris</i>)	03/04/2020	Protected Species: Wildlife Acts
bird	Arctic Tern (<i>Sterna paradisaea</i>)	31/07/1991	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Barn Owl (<i>Tyto alba</i>)	31/12/2011	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
bird	Barn Swallow (<i>Hirundo rustica</i>)	31/12/2011	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Black-headed Gull (<i>Larus ridibundus</i>)	31/12/2011	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
bird	Brent Goose (<i>Branta bernicla</i>)	10/02/2004	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Canada Goose (<i>Branta canadensis</i>)	27/11/2017	Invasive Species: Invasive Species Invasive Species: Invasive Species >> High Impact Invasive Species Invasive Species: Invasive Species >> Regulation S.I. 477 (Ireland) Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section I Bird Species
bird	Common Coot (<i>Fulica atra</i>)	27/11/2017	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section I Bird Species Protected Species: EU Birds Directive >> Annex III, Section II Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Common Goldeneye (<i>Bucephala clangula</i>)	31/12/2011	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section II Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Common Grasshopper Warbler (<i>Locustella naevia</i>)	31/12/2011	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Common Greenshank (<i>Tringa nebularia</i>)	27/11/2017	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List

Species group	Species name	Date of last record	Designation
bird	Common Kestrel (<i>Falco tinnunculus</i>)	31/12/2011	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Common Kingfisher (<i>Alcedo atthis</i>)	31/12/2011	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Common Linnet (<i>Carduelis cannabina</i>)	31/12/2011	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Common Pheasant (<i>Phasianus colchicus</i>)	31/12/2011	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section I Bird Species Protected Species: EU Birds Directive >> Annex III, Section I Bird Species
bird	Common Pochard (<i>Aythya ferina</i>)	31/12/2011	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section I Bird Species Protected Species: EU Birds Directive >> Annex III, Section II Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Common Redshank (<i>Tringa totanus</i>)	31/12/2001	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
bird	Common Sandpiper (<i>Actitis hypoleucos</i>)	31/12/2011	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Common Shelduck (<i>Tadorna tadorna</i>)	31/12/2011	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Common Snipe (<i>Gallinago gallinago</i>)	31/12/2011	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section I Bird Species Protected Species: EU Birds Directive >> Annex III, Section III Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Common Starling (<i>Sturnus vulgaris</i>)	31/12/2011	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Common Swift (<i>Apus apus</i>)	31/12/2011	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Common Tern (<i>Sterna hirundo</i>)	31/12/2011	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of

Species group	Species name	Date of last record	Designation
			Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Common Wood Pigeon (Columba palumbus)	31/12/2011	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section I Bird Species Protected Species: EU Birds Directive >> Annex III, Section I Bird Species
bird	Corn Crane (Crex crex)	31/07/1991	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
bird	Eurasian Curlew (Numenius arquata)	09/03/2020	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section II Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
bird	Eurasian Oystercatcher (Haematopus ostralegus)	10/02/2004	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Eurasian Teal (Anas crecca)	27/11/2017	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section I Bird Species Protected Species: EU Birds Directive >> Annex III, Section II Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Eurasian Wigeon (Anas penelope)	27/11/2017	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section I Bird Species Protected Species: EU Birds Directive >> Annex III, Section II Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Eurasian Woodcock (Scolopax rusticola)	31/12/2011	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section I Bird Species Protected Species: EU Birds Directive >> Annex III, Section III Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Great Black-backed Gull (Larus marinus)	31/12/2011	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Great Cormorant (Phalacrocorax carbo)	24/10/2017	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Great Crested Grebe (Podiceps cristatus)	31/12/2011	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List

Species group	Species name	Date of last record	Designation
bird	Greater Scaup (Aythya marila)	31/12/2011	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section II Bird Species Protected Species: EU Birds Directive >> Annex III, Section III Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Herring Gull (Larus argentatus)	31/12/2011	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
bird	House Martin (Delichon urbicum)	08/04/2016	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	House Sparrow (Passer domesticus)	31/12/2011	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Lesser Black-backed Gull (Larus fuscus)	31/12/2011	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Little Grebe (Tachybaptus ruficollis)	27/11/2017	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Long-tailed Duck (Clangula hyemalis)	31/12/2011	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section II Bird Species
bird	Mallard (Anas platyrhynchos)	12/09/2019	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section I Bird Species Protected Species: EU Birds Directive >> Annex III, Section I Bird Species
bird	Mediterranean Gull (Larus melanocephalus)	31/12/2011	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Merlin (Falco columbarius)	31/12/2011	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Mew Gull (Larus canus)	31/12/2011	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Mute Swan (Cygnus olor)	24/10/2017	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List

Species group	Species name	Date of last record	Designation
bird	Northern Lapwing (Vanellus vanellus)	31/07/1991	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section II Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
bird	Northern Wheatear (Oenanthe oenanthe)	31/12/2011	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Red-billed Chough (Pyrrhocorax pyrrhocorax)	31/12/2011	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Red-breasted Merganser (Mergus serrator)	31/12/2011	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section II Bird Species
bird	Ringed Plover (Charadrius hiaticula)	31/07/1972	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Rock Pigeon (Columba livia)	31/12/2011	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section I Bird Species
bird	Sand Martin (Riparia riparia)	31/12/2011	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Sky Lark (Alauda arvensis)	31/12/2011	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Spotted Flycatcher (Muscicapa striata)	31/12/2011	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Stock Pigeon (Columba oenas)	31/07/1991	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Tufted Duck (Aythya fuligula)	27/11/2017	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section I Bird Species Protected Species: EU Birds Directive >> Annex III, Section II Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Water Rail (Rallus aquaticus)	31/12/2011	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List

Species group	Species name	Date of last record	Designation
bird	Whooper Swan (Cygnus cygnus)	27/11/2017	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Yellowhammer (Emberiza citrinella)	31/07/1972	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
bony fish (Actinopterygii)	Atlantic Salmon (Salmo salar)	31/12/2004	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex II Protected Species: EU Habitats Directive >> Annex V Threatened Species: OSPAR Convention Threatened Species: Vulnerable
clubmoss	Fir Clubmoss (Huperzia selago)	31/12/1999	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex V
crustacean	Freshwater White-clawed Crayfish (Austropotamobius pallipes)	31/12/2007	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex II Protected Species: EU Habitats Directive >> Annex V Protected Species: Wildlife Acts
insect - butterfly	Marsh Fritillary (Euphydryas aurinia)	31/12/2010	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex II Threatened Species: Vulnerable
marine mammal	Common Seal (Phoca vitulina)	05/12/2012	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex II Protected Species: EU Habitats Directive >> Annex V Protected Species: Wildlife Acts
marine mammal	Grey Seal (Halichoerus grypus)	30/01/2014	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex II Protected Species: EU Habitats Directive >> Annex V Protected Species: Wildlife Acts
moss	Irish Beard-moss (Didymodon maximus)	06/07/2003	Protected Species: Flora Protection Order Protected Species: Flora Protection Order >> Flora Protection Order 2015 Schedule B (Mosses) Threatened Species: Near threatened
moss	Large White-moss (Leucobryum glaucum)	27/06/2003	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex IV Threatened Species: Least concern
reptile	Common Lizard (Zootoca vivipara)	08/08/2020	Protected Species: Wildlife Acts
terrestrial mammal	Brown Long-eared Bat (Plecotus auritus)	01/07/2008	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts
terrestrial mammal	Daubenton's Bat (Myotis daubentonii)	01/07/2008	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts
terrestrial mammal	Eurasian Badger (Meles meles)	15/01/2018	Protected Species: Wildlife Acts
terrestrial mammal	Eurasian Pygmy Shrew (Sorex minutus)	10/04/1993	Protected Species: Wildlife Acts
terrestrial mammal	Eurasian Red Squirrel (Sciurus vulgaris)	28/05/2018	Protected Species: Wildlife Acts
terrestrial mammal	European Otter (Lutra lutra)	22/01/2014	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex II Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts

Species group	Species name	Date of last record	Designation
terrestrial mammal	Fallow Deer (Dama dama)	28/05/2018	Invasive Species: Invasive Species Invasive Species: Invasive Species >> High Impact Invasive Species Invasive Species: Invasive Species >> Regulation S.I. 477 (Ireland) Protected Species: Wildlife Acts
terrestrial mammal	Lesser Noctule (Nyctalus leisleri)	16/07/2013	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts
terrestrial mammal	Natterer's Bat (Myotis nattereri)	01/07/2008	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts
terrestrial mammal	Pine Marten (Martes martes)	28/05/2018	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex V Protected Species: Wildlife Acts
terrestrial mammal	Pipistrelle (Pipistrellus pipistrellus sensu lato)	12/08/2014	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts
terrestrial mammal	Red Deer (Cervus elaphus)	20/10/2015	Protected Species: Wildlife Acts
terrestrial mammal	Soprano Pipistrelle (Pipistrellus pygmaeus)	12/08/2014	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts
terrestrial mammal	West European Hedgehog (Erinaceus europaeus)	24/04/2018	Protected Species: Wildlife Acts

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APPENDIX D

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Site Name: Lough Gill SAC

Site Code: 001976

This site includes Lough Gill, Doon Lough to the north-east, the Bonet River (as far as, but not including, Glenade Lough), and a stretch of the Owenmore River near Manorhamilton in Co. Leitrim. Lough Gill itself, 2 km east of Sligo town, lies at a geological junction of ancient metamorphic rocks which produce acid groundwater, and limestone which dissolves in the groundwater.

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

[3150] Natural Eutrophic Lakes
[6210] Orchid-rich Calcareous Grassland*
[91A0] Old Oak Woodlands
[91E0] Alluvial Forests*
[1092] White-clawed Crayfish (<i>Austropotamobius pallipes</i>)
[1095] Sea Lamprey (<i>Petromyzon marinus</i>)
[1096] Brook Lamprey (<i>Lampetra planeri</i>)
[1099] River Lamprey (<i>Lampetra fluviatilis</i>)
[1106] Atlantic Salmon (<i>Salmo salar</i>)
[1355] Otter (<i>Lutra lutra</i>)

Lough Gill is a large lake, being 8 km long, and has steep limestone shores and underwater cliffs. It is over 20 m deep in places. The lake appears to be naturally eutrophic. The aquatic macrophyte flora is very limited, probably due to the rapid increase in depth around most of the margin. Species such as pondweeds (*Potamogeton* spp.) are present, as well as Shoreweed (*Littorella uniflora*). Where the lake shore has a shallow gradient, some swamp vegetation occurs, mainly dominated by Common Reed (*Phragmites australis*), with Common Club-rush (*Scirpus lacustris*) and sedges (*Carex* spp.).

The Old Oak Woodlands within this site are dominated by oak (*Quercus* spp.), Rowan (*Sorbus aucuparia*) and willows (*Salix* spp.). A number of interesting tree species occur. Strawberry Tree (*Arbutus unedo*) is found in its most northerly site in the world. Yew (*Taxus baccata*) occurs in abundance. Bird Cherry (*Prunus padus*), a Red Data Book species, is also found, as is the nationally scarce Rock Whitebeam (*Sorbus rupicola*). Some areas of conifer plantation occur in association with these woodlands.

There is a fringe of deciduous woodland along most of the length of the Garvoge River. In parts it is dense and impenetrable, with a very wet marshy underlayer. Some areas are dominated by Rusty Willow (*Salix cinerea* subsp. *oleifolia*), with Alder (*Alnus glutinosa*) also occurring commonly. Other tree species present include Goat Willow (*Salix caprea*), Hazel (*Corylus avellana*), Rhododendron (*Rhododendron ponticum*) and Cherry Laurel (*Prunus laurocerasus*). Both of the latter species are invasive aliens. In the understorey, species such as Guelder-rose (*Viburnum opulus*), Gipsywort (*Lycopus europaeus*) and Skullcap (*Scutellaria galericulata*) are found. Reedswamp is also common along the river. Another area of alluvial wet woodland is found at the mouth of the Bonet River. Here there is dense willow (*Salix* sp.) scrub, along with Reed Canary-grass (*Phalaris arundinacea*), and also areas where Alder and Goat Willow are dominant.

Areas of unimproved wet and dry grassland also occur within the site, the former particularly by the lake and the latter well developed in the north-east of the site and in the vicinity of O'Rourke's Table. Orchid-rich Calcareous Grassland, a priority habitat listed on Annex I of the E.U. Habitats Directive, has been reported from Clogher Beg, according to the Irish Semi-natural Grasslands Survey, 2010. Heath-covered hillsides above the woods are dominated by Heather (*Calluna vulgaris*).

The site also supports several rare plant species, including Yellow Bird's-nest (*Monotropa hypopitys*), the lady's-mantle species *Alchemilla glaucescens*, Ivy Broomrape (*Orobancha hederarum*), Black Bryony (*Tamus communis*), Intermediate Wintergreen (*Pyrola media*) and Bird's-nest Orchid (*Neottia nidus-avis*). There is also an unconfirmed record for Melancholy Thistle (*Cirsium helenioides*) from the eastern side of the site.

Both the woods and the mountains are used by a large herd of Fallow Deer. The site is of considerable importance for the presence of four Red Data Book fish species that are listed on Annex II of the E.U. Habitats Directive - Brook Lamprey (*Lampetra planeri*), River Lamprey (*Lampetra fluviatilis*), Sea Lamprey (*Petromyzon marinus*) and Atlantic Salmon (*Salmo salar*). The Lough Gill system gets a very early run of spring salmon, while the Bonet holds stocks of salmon from spring right through to the end of the season. White-clawed Crayfish (*Austropotamobius pallipes*), Otter and Pine Marten are well established on this site, the first two are both Annex II species. The woodlands have a fauna which includes several rare snail species.

Lough Gill supports low numbers of wintering waterfowl, mostly Mallard (<150), Tufted Duck (20-30) and Goldeneye (<20). A small colony of Common Tern breed on the islands (20 pairs in 1993), while Kingfisher are found on the lake and rivers. Both of these species are listed on Annex I of the E.U. Birds Directive. A colony of Black-headed Gulls (63 pairs in 1992) occurs with the terns. The woods support a good diversity of bird species including Jay, Woodcock and Blackcap.

The site is of importance for four habitats listed on Annex I of the E.U. Habitats Directive, including two with priority status. It is also noted for the high number of rare or scarce animal and plant species.

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APPENDIX E



<https://www.teagasc.ie/news--events/daily/environment/how-to-plant-a-hedge.php>

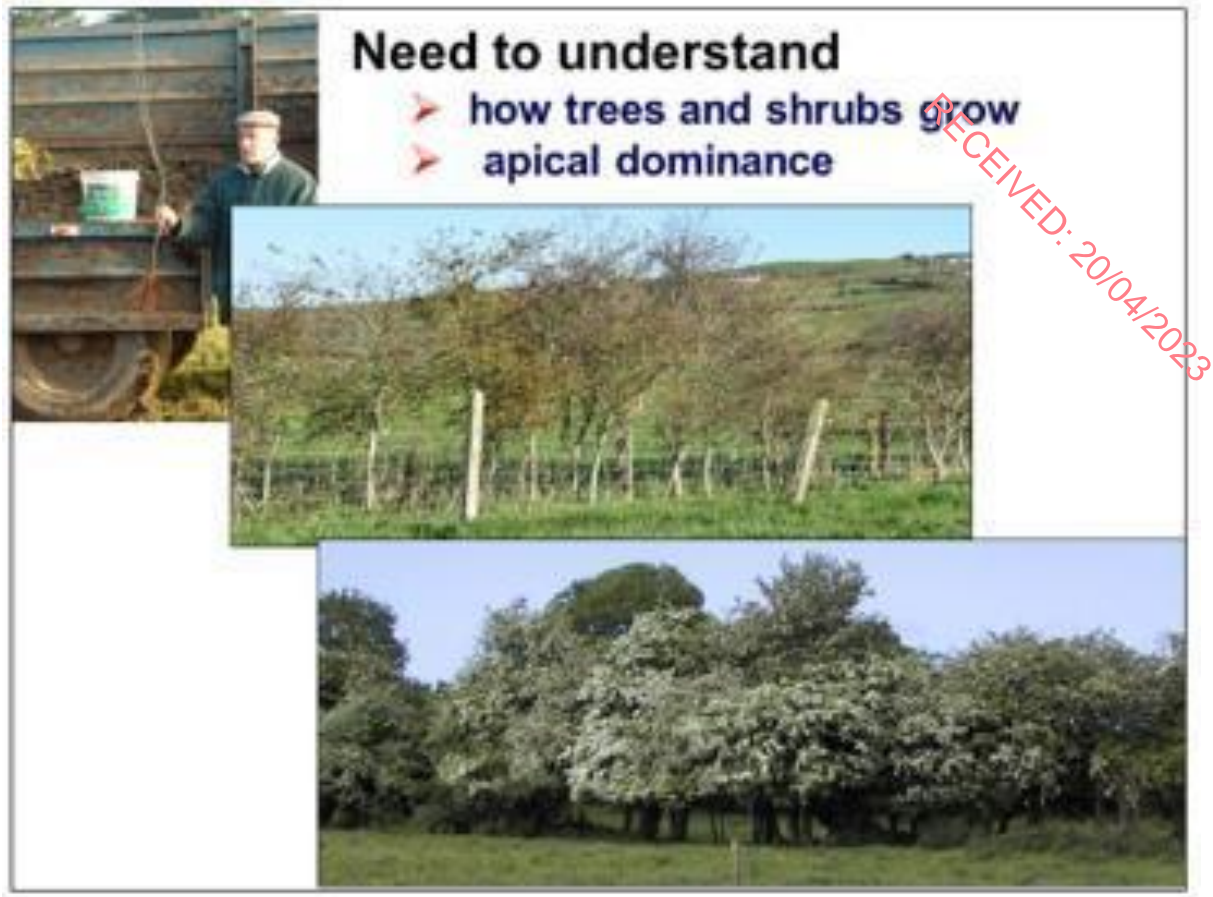
11 December 2020



How to plant a hedge

When thinking of planting a new hedge, you must first decide if you want a hedge with a dense base that will be regularly topped **OR** if you want a line of trees that will never be topped

What type of hedge do you want?	
	Topped <ul style="list-style-type: none">• Traditional hedge• Dense base
or	
	Untopped <ul style="list-style-type: none">• Escaped hedge• Line of trees• Linear woodland



Best practice to achieve a stockproof hedge - dense at the base:

- Buy 2 year old bare rooted whips, 6 plants per m, mainly whitethorn, but once every 2 m replace one with another hedging species that tolerates trimming such as
 - Blackthorn,
 - Holly,
 - Hazel,
 - Spindle,
 - Guelder Rose,
 - Dog Rose and;
 - Woodbine
- Therefore for every 100m of new hedge - buy 550 whitethorn and 50 other these other species

Hedging trees / shrubs thrive with cutting OR if left as tree



- Mark out the line of the new hedge using wire, twine or lime
- Cultivate with a digger or mini-digger
 - To make it easier to plant and give plants a great start



- Protect roots from drying out during planting by keeping plants in the bag until needed
- Plant in a double staggered row – with 330mm (just over a foot) between the rows and the same between the plants within the rows – often the length of a boot



- Plant to the same depth as was previously planted
 - Don't bury the stem or expose the roots
 - Firm in
- Identify a few whitethorn (maybe 5 / 100m) to be retained as trees and protect with tree guards or shelters
- Prune all other plants except holly down to an inch or so above ground level with a sloping cut to leave a sharp point



- Push a 4 foot or 1.2m wide strip of used silage plastic down neatly over the cut stumps.
- Press the edges of the plastic into the ground to hold it down
- Protect from livestock including rabbits *if* The aim is to remove that wire in a few years



Choosing the right species of native tree and shrub

As mentioned, choosing the right species of tree and shrub is very important in urban areas where there are restrictions on space. Where possible, always use native species. Below is a list of the trees and shrubs native to Ireland, and advice on the locations to which they are suited.

Common name	Latin name	Height (max)	Suitable for public open spaces	Suitable for streets and confined spaces	Suitable for tubs, containers, raised beds etc.	Guide to planting: see key below
Alder	<i>Alnus glutinosa</i>	22m	Yes	No	Yes	ADPS
Alder buckthorn	<i>Frangula alnus</i>	6m	Yes	No	Yes	D
Arbutus (strawberry tree)	<i>Arbutus unedo</i>		Yes	No	Yes	
Ash	<i>Fraxinus excelsior</i>	28m	Yes	Yes	No	ADIPS
Aspen	<i>Populus tremula</i>	24m	Yes	No	No	DPSV
Bird cherry	<i>Prunus padus</i>	14m	Yes	Yes	Yes	P
Bramble	<i>Rubus fruticosus</i>					C/H
Broom	<i>Cytisus scoparius</i>	2m				
Burnet rose	<i>Rosa pimpinellifolia</i>					C/H
Common (or European) gorse	<i>Ulex europeus</i>	2.5m				HV
Crab apple	<i>Malus sylvestris</i>	6m	Yes	No	No	AHIP
Dog rose	<i>Rosa canina</i>					C/H
Downy birch	<i>Betula pubescens</i>	18m	Yes	Yes	Yes	ADIP
Elder	<i>Sambucus nigra</i>	6m				V
Guelder rose	<i>Viburnum opulus</i>	4.5m				DH

Hawthorn	<i>Crataegus monogyna</i>	9m				AHIPS
Hazel	<i>Corylus avellana</i>	6m				AHS
Holly	<i>Ilex aquifolium</i>	15m	Yes	No	Yes	AHPS
Honeysuckle	<i>Lonicera periclymenum</i>					C
Ivy	<i>Hedera helix</i>					C
Juniper	<i>Juniperus communis</i>	6m	Yes	No	No	
Pedunculate oak	<i>Quercus robur</i>	30m	Yes	No	No	AI
Privet	<i>Ligustrum vulgare</i>	3m				No
Purging buckthorn	<i>Rhamnus cathartica</i>	4.5m				AHPV
Rowan or mountain ash	<i>Sorbus aucuparia</i>	9m	Yes	Yes	Yes	ADHIP
Scots pine	<i>Pinus sylvestris</i>	24m	Yes	No	No	AI
Sessile oak	<i>Quercus petraea</i>	30m	Yes	No	No	AI
Silver birch	<i>Betula pendula</i>	18m	Yes	Yes	Yes	ADIP
Sloe, blackthorn	<i>Prunus spinosa</i>	3m				AHPV
Spindle	<i>Euonymus europaeus</i>	7.5m				H
Western (or mountain) gorse	<i>Ulex gallii</i>					
Whitebeam spp.	<i>Sorbus aria/S. anglica/S. devoniensis/S. hibernica/S. latifolia/S. rupicola</i>	12m	Yes	Yes	Yes	IPS
Wild cherry	<i>Prunus avium</i>	15m	Yes	Yes	Yes	AHI

Willow spp.	<i>Salix spp.</i>	6m				V
Wych elm	<i>Ulmus glabr</i>	30m	Yes		No	PS
Yew	<i>Taxus baccata</i>	14m	Yes	No	Yes	AIPS

A – Grows in a wide variety of soils

C – Climber

H – Suitable for hedging

I – Suitable as an individual tree

D – Tolerates or prefers damp conditions

P – Tolerates smoke or pollution

S – Tolerates shade

V – Invasive

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Pollinator friendly garden plants

Aim to have 3-5 different types of these plants flowering in your garden each season. These suggestions are **not** exhaustive; many other flowers are also good for pollinators. For more planting suggestions visit www.rhs.org.uk/perfectforpollinators.

		SPRING	SUMMER	AUTUMN
		March-May	June-Aug	Sept-Oct
	Wildflowers in long grass These are examples of plants that will grow naturally in long grass; you do not need to buy seed or plants!	Dandelion Dead-nettle Vetch	Bird's foot trefoil Brassicas Clovers Geranium Knapweed Oxeye daisy Self-heal Speedwell Thistle Vetch Yarrow	Autumn Hawkbit Clovers Hawksbeard Vetch
	Ornamental plants and herbs	Comfrey Hellebores Lungwort Spring/winter Heather	Borage Calamint Catmint Columbine Delphinium Globe thistle Lavender Oregano Penstemon Poppy Scabious Stachys Sneezeweed Thyme Viper's bugloss	Aster Button Snakewort Coneflower Eupatorium Heathers Single Sunflowers ^(Annual) Stonecrop
	Flowering trees/shrubs	Barberry (Berberis) Broom Crab apple Forsythia Hawthorn Mahonia Rowan Viburnum Wild cherry Willow	Bramble Cotoneaster Deutzia Firethorn Laburnum Rock Rose Viburnum	Hebe Ivy Russian Sage (sub-shrub)
	Fruit and Veg Many of the fruits and vegetables you grow in your garden need pollinators to produce seeds and fruit!	Apples Blueberries Cherry plum Currants	Blackberries Courgettes Field/runner beans Pumpkins Raspberries Strawberries Tomatoes	

Info Box:
 Letting a small portion of Brassica plants (e.g. Cabbage, Kale, Brussel sprouts) flower can help provide food for pollinators in your garden

RECEIVED: 20/04/2023

APPENDIX F

Hy-Tex Terrastop™ Silt Fences for Stormwater Run-Off Control

Hy-Tex Terrastop silt fence in use on National Grid's Milford Haven to Aberdulais gas pipeline project



Hy-Tex Terrastop silt fence in use on National Grid's Felindre to Brecon gas pipeline project



News: Terrastop HighFlow trapped approx. 5 tonnes of silt per 10m fence run over 1 month on potato field trials in Scotland

Terrastop™ Premium (W1380)



1137-CPR-0613/29

Sand bags in both grades also available for no-dig solutions. Call for further details

Many construction, forestry and farming activities result in disturbed or bare ground that is vulnerable to weather erosion. The silt laden run-off, plus site debris and other pollutants, often contaminates surrounding land, watercourses, lakes and drains - resulting in significant environmental diffuse pollution and potentially costly fines.

However, due to the on-going nature of such work, it is generally not possible to protect exposed surfaces until the project is complete. So stormwater from such sites represents a major non-point source of diffuse water pollution in the UK.

Solution: Hy-Tex *Terrastop™ Premium*, and *HighFlow* silt fences, offer a proven, practical, economic and effective method to reduce stormwater run-off pollution from such locations. They are special, high quality, permeable, technical filter fabrics, that can be installed as an entrenched vertical barrier fence, and are designed to intercept and detain run-off - trapping harmful silt through settlement and filtration before it leaves the site.

Performance: The benefits of silt fences are increasingly becoming recognised in Britain: The Environment Agency/SEPA Pollution Prevention Guidelines (PPG5) now recommend the use of silt fences to reduce silt transport from exposed ground and stock piles; and research at The James Hutton Institute, using Terrastop silt fencing, demonstrated that even after post-harvest contour grubbing of potato fields an estimated 80 tonnes of soil containing 60-70 kg phosphate-P contaminants was trapped from a 17ha field [Dr Andy Vinten].

While in other countries where silt fences have been used extensively for many years, their proven performance (Intercepting up to 86% of suspended solids [Horner et al. 1990]) has made them a standard *Best Management Practice* on a diverse range of projects.

From this in-depth research, and practical experience, Hy-Tex *Terrastop™ Premium* and *HighFlow* were developed to exceed the highest standards, with many unique features for ease of use, reliability and effective results.

Key Features: General purpose non-woven and woven geotextiles are unsuitable for silt fence use as they clog, overtop and inadequately filter sediment due to poor hydraulic properties (typically less than 10 l/m²/sec) and often fail: tearing and fraying (as they are too weak to withstand the forces of stormwater/silt build-up without costly additional wire support fences) or becoming brittle quickly (due to lack of UV protection). *Terrastop™ Premium* and *HighFlow* are manufactured specifically as silt fences so have high tensile and burst strengths, premium UV stabilisation, woven structures with tear resistant non-fraying reinforced edges, that are durable and self supporting between fixing posts for reliability, as well as having a visually pleasing subtle green colour.

The CE Mark certified *Terrastop Premium* also has an special fibrous weft yarn, combined with a high quality weave, to enhance filtration, maintain flow and minimise clogging.

Installation Aids: Silt fences also often fail through poor installation or aftercare, therefore *Terrastop™ Premium* incorporates pre-marked lines for burial depth and maximum silt accumulation level to ensure correct set-up and maintenance; as well as a top ribbon strip to simplify post attachment and tensioning.

Specification	Terrastop™ Premium (Terrasilt GR180)	Terrastop™ HighFlow
Tensile Strength	22kN/m	32kN/m
Puncture Resistance (CBR)	3,500N	3,700N
Permeability (ISO 11058)	21 l/m ² .s (45 l/m ² .s to AS 3706.9)	190 l/m ² .s
Opening Size (ISO 11058)	180µm	320µm
Weight	200g/m ²	145g/m ²
Material	1000µ thick, green/black, 400kLy UV stabilised, polypropylene, tear resistant non-fraying edges.	500µ thick, green/black, 450kLy UV stabilised, polyethylene, tear resistant non-fraying edges.
Roll Size	0.75 x 100m	1.00 x 100m
Other Key Features:	Fibrous weft yarn, burial depth and max silt height marker lines, top tying-off + tensioning ribbon.	

Kirsty Liddon's Edinburgh University Dissertation "Prevention of Diffuse Pollution from Active Forestry Harvesting Sites:" concluded "the Hy-Tex [Terrastop Premium] material appears to be the most suitable material for use as sediment retention as it has the most consistent performance between differing soil types retaining the highest volumes of sediment for both gley and peat solutions."

"Basic" grade also available for less stringent applications

Hy-Tex Terrastop™ Silt Fences for Stormwater Run-Off Control

Installation Guidelines

SCOPE

1. This practice covers common installation requirements for temporary silt fence applications.

2. This practice is applicable to the use of silt fences as vertical permeable interceptors designed to remove suspended soil from overland, non-concentrated water flow. The function of a temporary silt fence is to trap and allow settlement of soil particles from sediment-laden water and to filter particles from water permeating through the fabric. The purpose is to greatly limit the transport of eroded soil from the construction site by water runoff.

3. The practices presented herein are intended to ensure good workmanship and quality and are not necessarily adequate for all purposes in view of the wide variety of possible sediments and performance objectives.

4. This standard does not purport to address all safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate health and safety practices and determine the applicability of regulatory limitations prior to use.

CONDITIONS WHERE PRACTICE APPLIES

1. Below disturbed areas where erosion would occur in the form of sheet and rill erosion, and where ponded run-off will not cause damage.

2. Where the size of the drainage area is no more than 0.30 hectares per 100.00m of silt fence length; the maximum slope length behind the barrier is 30.00m; and the maximum gradient behind the barrier is 50 percent (2:1).

3. In minor swales or ditch lines where the maximum contributing drainage area is no greater than 0.80 hectares.

4. Under no circumstances should silt fences be constructed in live streams or in swales or ditch lines where flows are likely to exceed 0.03m³/s.

5. Silt fence should not be used in areas where rock or hard surfaces prevents the full and uniform depth anchoring of the barrier.

DESIGN CRITERIA

1. An effort should be made to locate silt fence at least 1.50 to 2.00m beyond the base of disturbed slopes with grades greater than 7%.

2. Properly supported silt fence which stands 0.60 metres above the existing grade tends to promote more effective sediment control (higher fences are vulnerable to excessive wind resistance or may impound volumes of water sufficient to cause failure of the structure).

3. A minimum 150mm of silt fence shall be embedded.

4. Maximum post spacing shall be 1.50m.

CONTROLLING MATERIAL SPECIFICATIONS

1. The material used for temporary silt fence shall be Hy-Tex Terrastop™ Premium, or similar approved, with CE Mark certification for EN13253: erosion control works and conforming to the following specification requirements:

Grab tensile strength [ASTM D4632]: minimum 0.98kN warp, 0.95kN weft. Water permeability [NBN EN ISO 11058]: minimum 21 l/m².s. Opening size [EN ISO 12956]: maximum 180µm. Composition: 400kLy UV stabilised woven polypropylene with split tape warp and fibrillated fibre weft yarns, burial depth and maximum silt accumulation marker lines, top tying-off and tensioning ribbon, tear resistant non-fraying edges and 0.75m fabric width.

2. The contractor shall provide to the engineer all certifications required by the controlling material specification.

3. Silt fence materials shall be subject to sampling and testing in accordance with, and to verify conformance with, the controlling material specification.

4. All posts shall be a minimum length of 1.20m, have sufficient strength to resist damage during installation and to support the applied loads due to material build up behind the silt fence.

[Note 1]: Generally, for wooden posts the cross section must be minimum 30 x 30mm for hardwood and 50 x 50mm for softwood; while steel posts (standard "U", "T" or "L" section) must be a minimum weight of 2kg/m).

INSTALLATION

1. Silt fences sections should be continuous and transverse to the flow. The silt fence should follow the contours of the site as closely as possible. Place the fence such that the water cannot runoff around the end of the fence, extending ends upslope enough to allow water to pond behind the fence (See figure 2)..

2. A trench shall be excavated approximately 100mm wide and 100mm deep on the upslope side of the proposed silt fence location.

3. Bury bottom 150mm of silt fence (To top of RED MARKER LINE on Terrastop™ Premium) in a "L" configuration in the trench so that no flow can pass under the silt fence. Backfill the trench and compact the soil over the geotextile so that the compacted soil completely fills the trench.

4. Compaction prior to installing posts is generally recommended. Compact the backfill soil immediately next to the silt fence geotextile. Compact the upslope side first, and then the downslope side. The soil adjacent to the buried silt fence geotextile shall be compacted to achieve no less than 50% of its original in situ strength, unless otherwise specified.

[Note 2]: Poor compaction is one of the main causes of silt fence failure. Installed posts may interfere with compaction by large equipment adjacent to the silt fence. Compaction is commonly accomplished with the front wheel of a tractor, skid steer, roller or other device, as well as with manual tamping or other manual means, taking care not to damage the silt fence.

5. When joints are unavoidable, the fabric shall be spliced together only at a support post, with a min. 300mm overlap, and securely sealed so that there are

no gaps, voids, or other loss of integrity of the barrier, ideally by wrapping the overlap around the post.

6. Place the posts tight to the downslope side of the silt fence at 1.50m spacing. Drive posts a minimum of 500mm into the ground. Increase depth to 600mm if fence is placed on a slope of 3:1 or greater.

[Note 3]: Where 500mm depth is impossible to attain, posts should be adequately secured/braced to stop overturning of the fence due to sediment loading.

7. Fasten the filter fabric securely and taut to the upslope side of the posts using top ribbon (see figure 3), wire/cable ties threaded through the silt fence, or 30mm long extra wide head galvanised clout nails (The fabric shall not be stapled to existing trees). Where required, tighten top edge of fabric by looping top ribbon over posts, and strain/brace posts to maintain fence tension and stability (See figure 1).

[Note 4]: If a silt fence is to be constructed across a ditch line or swale, the fence length must be sufficient to eliminate endflow, the plan configuration shall resemble an arc or horseshoe with the ends oriented upslope, and post spacing a maximum of 1.00m.

MAINTENANCE

1. The contractor shall inspect all temporary silt fences immediately after each rainfall, and at least daily during prolonged rainfall. The contractor shall immediately correct any deficiencies.

2. The contractor shall also make a daily review of the location of silt fences in areas where construction activities have altered the natural contour and drainage runoff to ensure that the silt fences are properly located for effectiveness. Where deficiencies exist, as determined by the engineer, additional silt fence shall be installed as directed by the engineer.

3. Repair damaged or otherwise ineffective silt fences or replace promptly.

4. Either remove sediment deposits when the accumulation reaches one third the height of the exposed fence (Top of BROAD WHITE/BLACK MARKER BAND on Terrastop™ Premium), or install a second silt fence as directed by the engineer.

5. The silt fence shall remain in place until the engineer directs it be removed. Upon removal the contractor shall remove and dispose of any excess sediment accumulations, dress the area to give it a pleasing appearance, and vegetate all bare areas in accordance with contract requirements.

6. Removed silt fence may be used at other locations provided the geotextile and other material requirements continue to be met to the satisfaction of the engineer.

Figure 1: Hy-Tex Terrastop™ Premium

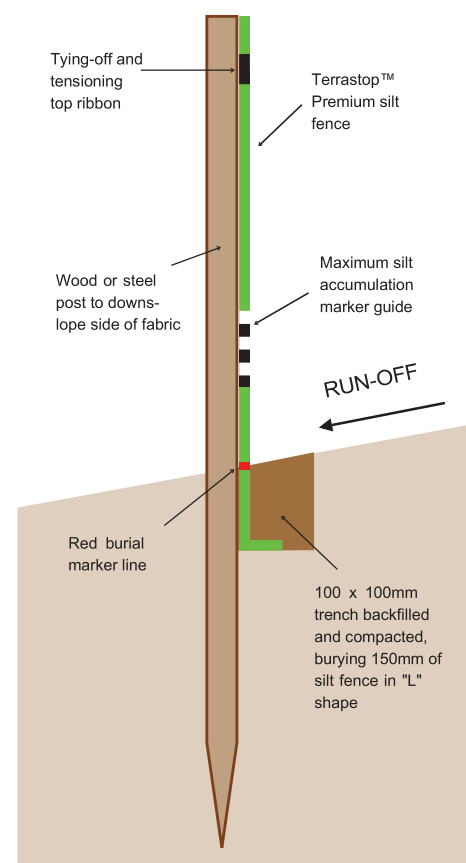


Figure 2: Silt Fence Placement

Alignments called 'U' or 'J' hooks ensure water & sediment pond behind each silt fence.

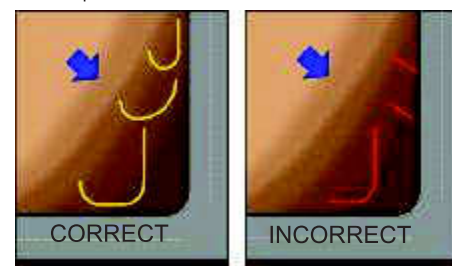
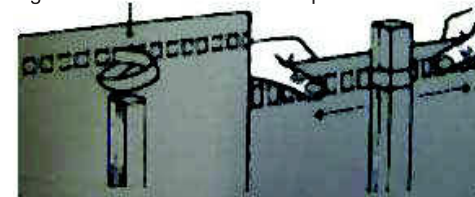


Figure 3: Ribbon attachment to post



Disclaimer: All information is provided in good faith, but without warranty. Nor does it form part of any contract, or intended contract, with the Buyer/User. Further conditions apply, details available on request.