Planning and Environmental Consultants

Natura Impact Statement

Single House Development at Ballincar, Co. Sligo

DOCUMENT DETAILS

Client:	**Martview Ltd.**
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Planning and Environmental Consultants

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1. INTRODUCTION

1.1 Background

McCarthy Keville O'Sullivan Ltd. (MKO) has been appointed to provide the information necessary to allow the competent authority to conduct an Article 6(3) Appropriate Assessment of a proposed single house development at Ballincar, Co. Sligo.

Screening for Appropriate Assessment is required under Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (the Habitats Directive). Where it cannot be excluded that a project or plan, either alone or in combination with other projects or plans, would have a significant effect on a European Site then same shall be subject to an appropriate assessment of its implications for the site in view of the site's conservation objectives. The current project is not directly connected with, or necessary for, the management of any European Site consequently the project has been subject to the Appropriate Assessment Screening process, as provided in Section 3 of this NIS.

The assessment in this report is based on a desk study and field surveys undertaken on the 14th of December 2020.

This Natura Impact Statement has been prepared in accordance with the European Commission's Assessment of Plans and Projects Significantly affecting Natura 2000 Sites: Methodological Guidance on the provisions of Article 6(3) and 6(4) of the Habitats Directive 92/43/EEC (EC, 2001) and Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC (EC, 2018) as well as the Department of the Environment's Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities (DoEHLG, 2010).

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

1. *European Communities (2000) Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC, Office for Official Publications of the European Communities, Luxembourg. European Commission,*
2. *Directive 92/43/EEC, Office for Official Publications of the European Communities, Luxembourg. European Commission,*
3. *EC (2007) Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC – Clarification of the concepts of: alternative solutions, imperative reasons of overriding public interest, compensatory measures, overall coherence, opinion of the commission. European Commission.*

1.2 Appropriate Assessment

1.2.1 Screening for Appropriate Assessment

Screening is the process of determining whether an Appropriate Assessment is required for a plan or project. Under Part XAB of the Planning and Development Act, 2000, as amended, screening must be carried out by the Competent Authority. As per Section 177U of the Planning and Development Act, 2000, as amended 'A screening for appropriate assessment shall be carried out by the competent authority to assess, in view of best scientific knowledge, if that Land use plan or proposed development, individually or in combination with another plan or project is likely to have a significant effect on the European site'. The Competent Authority's determination as to whether an Appropriate Assessment is required must be made on the basis of objective information and should be recorded. The Competent Authority may request information to be supplied to enable it to carry out screening.

Consultants or project proponents may provide for the competent authority, the information necessary for them to determine whether an Appropriate Assessment is required and provide advice to assist them in the Article 6(3) Appropriate Assessment Screening decision.

Where it cannot be excluded beyond reasonable scientific doubt at the Screening stage, that a proposed plan or project, individually or in combination with other plans and projects, would have a significant effect on the conservation objectives of a European site, an Appropriate Assessment is required.

Where an Appropriate Assessment is required, the Competent Authority may require the applicant to prepare a Natura Impact Statement.

The term Natura Impact Statement (NIS) is defined in legislation[1]. An NIS, where required, should present the data, information and analysis necessary to reach a definitive determination as to 1) the implications of the plan or project, alone or in combination with other plans and projects, for a European site in view of its conservation objectives, and 2) whether there will be adverse effects on the integrity of a European site. The NIS should be underpinned by best scientific knowledge, objective information and by the precautionary principle.

This report has been prepared in compliance with the provision of section 177U of the Planning & Development Act 2010 as amended.

Statement of Authority

A field assessment was undertaken by Pat Roberts (B.Sc., MCIEEM) on the 14th of December 2020. This report has been prepared by Julie O'Sullivan (B.Sc., M.Sc.). Julie is an experienced ecologist with over five years professional experience. This report has been reviewed by Pat Roberts (B.Sc., MCIEEM) who has over 15 years' experience in ecological consultancy.

[1] As defined in Section 177T of the Planning and Development Act, 2000 as amended, an NIS means a statement, for the purposes of Article 6 of the Habitats Directive, of the implications of a proposed development, on its own and in combination with other plans and projects, for a European site in view of its conservation objectives. It is required to include a report of a scientific examination of evidence and data, carried out by competent persons to identify and classify any implications for the European site in view of its conservation objectives

2. DESCRIPTION OF THE PROPOSED DEVELOPMENT

2.1 Site Location

The site (Plot 4) is located in Ballincar, Rosses Point, Co. Sligo, approximately 3km north-west of Sligo Town (grid reference: G 67394 38726). The site is accessed via a local road off the R291. The site is located approximately 120-125m north of Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC and Cumeen Strand SPA.

The location of the proposed development is shown in Figure 2.1.

2.2 Characteristics of the Proposed Development

2.2.1 Description of the project

The planning application is for a permission for the construction of a dwelling house, wastewater treatment system and all associated site works at Ballincar, Co. Sligo. The proposed development site is approximately 0.21ha. The layout of the proposed works is shown in Figure EJSA0, included in Appendix 1 of this report.

A site suitability assessment with regard to the onsite treatment of wastewater has been completed by a suitably qualified professional as part of the planning application for this development. The relevant conclusions of this report have been summarised below.

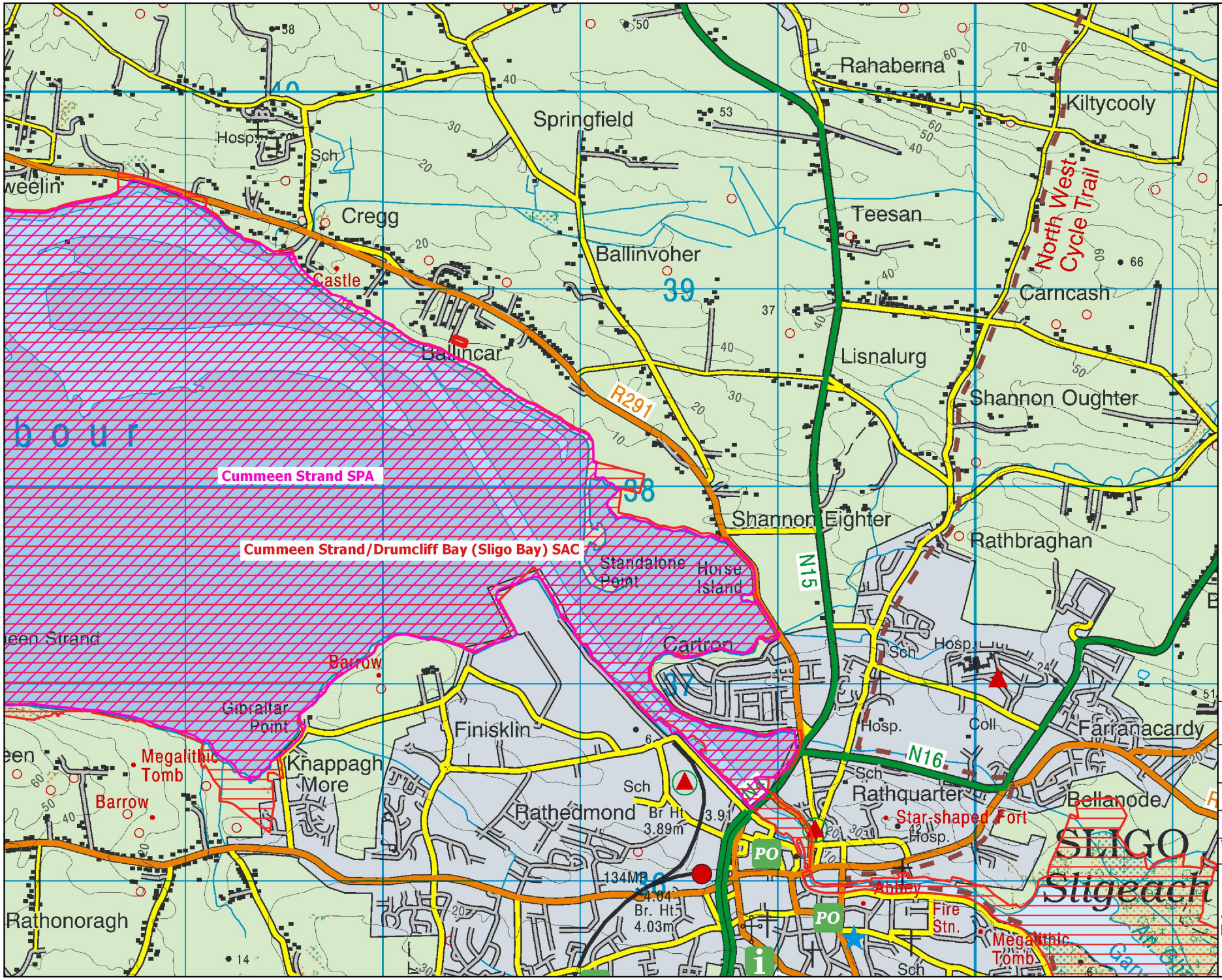
The site suitability assessment concluded that the proposed site is located in a Regionally Important Aquifer, with a Moderate Vulnerability Rating and is suitable for a packaged wastewater treatment system and polishing filter with discharge to ground. All tanks, filters, etc. will be installed in accordance with EPA Code of Practice.

The wastewater treatment proposed is a Tricel Novo wastewater treatment plant followed by a gravity fed soil polishing filter, also called a percolation area. The Tricel Novo provides secondary treatment using submerged aeration filter technology. The gravity fed soil polishing filter consists of a series of pipe work which distribute the effluent for treatment using the in-situ subsoil.

A Tricel Novo IRL8 wastewater treatment plant will be installed which is designed to treat a maximum of 1200 litres of wastewater per day. This recommendation is based on the EPA Code of Practice which states the plant selection should be based on a hydraulic loading rate of 150l/per person/per day. The Novo IRL8 has a capacity of 4000 litres, of which 1900 are in the primary chamber, this ensures a long desludging interval. The Tricel Novo range of wastewater treatment plants is fully in conformance with EN12566-3 and complies with SR66.

For the soil polishing filter, a minimum of 42m of percolation pipe will be required. The EPA Code of Practice outlines a loading rate on the trench of 50 l/m2/d based on a P/T value of 3-20. It recommends that each percolation trench should be equal in length and no longer than 10m. The percolation pipe is laid in trenches 500mm wide. A Tricel distribution box will be required to split the flow evenly into each trench to ensure even dispersal.

The location and detail of the proposed wastewater treatment and percolation area is shown in Figures EJSA1, EJSA2 & EJSA3, included in Appendix 1 of this report. Further details on the Tricel Novo Package Plant and Soil Polishing filter proposed are provided in the Site Characterisation report compiled by J O'Hara Consultant Engineering and a Tricel report that have been provided as Appendix 2.



Map Legend

- Site Boundary
- Special Area of Conservation (SAC)
- Special Protection Area (SPA)

Drawing Title

Site Location

Project Title

Maguire Ballincar NIS

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JOS	PR
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2.2.2 Best Practice Measures

Pollution Prevention

- The site boundary will be fenced off with a solid barrier prior to works commencing to protect adjacent habitats and to prevent any egress of machinery outside of the site during construction activities.
- All works associated with the proposed on-site wastewater treatment systems will be carried out in accordance with the EPA Code of Practice 2009 and current Building Regulations.
- A site-specific wastewater treatment facility is proposed to ensure no effect on the groundwater aquifer and the nearby European site. The proposed system will include a packaged wastewater treatment system and polishing filter which discharges to ground with a secondary treatment system proposed in conjunction with a sand polishing filter. All tanks, filters, etc. will be installed in accordance with the manufacturer's guidelines and the EPA Code of Practice. The details and location of the proposed wastewater treatment system and percolation area are provided in the layout drawings in the Site Characterisation report that has been provided as a separate document as part of this planning application.
- All works associated with the proposed on-site wastewater treatment system to be installed by a suitably qualified professional. The installation of the wastewater treatment system will be supervised by a chartered engineer at time of installation and installed by an experienced contractor.
- The wastewater treatment system will be serviced every twelve months and a maintenance agreement will be put in place with tricel.
- The site of the infiltration system will be staked and roped off before any construction activities begin to make others aware of the site and to keep traffic and materials off the site.
- Trenches will be backfilled as soon as possible after excavation.
- Earth-moving machinery will not circulate over the infiltration area before or, more importantly, after pipework and backfilling of trenches has been completed. The area will be clearly marked for the duration of any subsequent site works.
- All site plant will be inspected at the beginning of each day prior to use. Defective plant shall not be used until the defect is satisfactorily fixed. All major repair and maintenance operations will take place off site.
- Vehicles will never be left unattended during refuelling. Only dedicated trained and competent personnel will carry out refuelling operations and plant refuelling procedures shall be detailed in the contractor's method statements.
- Fuels, lubricants and hydraulic fluids for equipment used on the site will be carefully handled to avoid spillage, properly secured against unauthorised access or vandalism, and provided with spill containment.
- Potential impacts caused by spillages etc. during the construction phase will be reduced by keeping spill kits and other appropriate equipment on-site.

Earth Works

- In all circumstances, excavation depths and volumes will be minimised.
- All excavated spoil will be stockpiled and contained within the works area (site boundary), which will be entirely within the curtilage of the bounds of the existing agricultural field within its stone wall boundary's or transported off site to a designated waste facility.
- Earthworks will be carried out during periods of dry weather.

Waste Management

- All waste will be collected in skips and the site will be kept tidy and free of debris at all times.
- Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the site for disposal or recycling.
- All construction waste materials will be stored within the confines of the site, prior to removal from the site to a permitted waste facility.

Disturbance Limitation Measures

- All plant and equipment for use will comply with Statutory Instrument No 359 of 1996 "European Communities (Construction Plant and Equipment) (Permissible Noise Levels) Regulations 1996".
- Operating machinery will be restricted to the proposed works site area.
- Construction works will be limited to daylight hours and artificial lighting to facilitate works will not be permitted.
- The best means practical, including proper maintenance of plant, will be employed to minimise the noise produced by on-site operations.
- All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the contract.
- Compressors will be of the "sound reduced" models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers.
- Machines which are used intermittently will be shut down or throttled back to a minimum during those periods when they are not in use.
- Any plant such as generators or pumps which are required to work outside of normal working hours will be surrounded by an acoustic enclosure.

Invasive Species Prevention Measures

- Good construction site hygiene will be employed to prevent the introduction and spread of problematic invasive alien plant species (e.g. Rhododendron, Japanese Knotweed, Giant Rhubarb etc.) by thoroughly washing vehicles prior to entering the site.
- Materials used on site will be confirmed to be from a clean source that is free of invasive species.

Environmental Monitoring

- The contractor will assign a member of the site staff as the environmental officer with the responsibility for ensuring the environmental measures prescribed in this document are adhered to. Any environmental incidents or non-compliance issues will immediately be reported to the project team.

2.2.3 Description of the Baseline Ecological Environment

A dedicated habitat survey of the area within and in the vicinity of the proposed development was undertaken on 14th of December 2020.

The site was a field of Improved Agricultural Grassland (GA1) (Plates 2-1 & 2-2). Species recorded in the Improved Agricultural Grassland (GS2) habitat include Yorkshire fog (*Holcus lanatus*), perennial rye grass (*Lolium perenne*), ribwort plaintain (*Plantago lanceolata*) and creeping buttercup (*Ranunculus repens*). The western field boundary was marked by fencing and bramble scrub (WS1) and the eastern boundary consisted of a similar boundary, but with a stone wall adjacent to a residential house located to the north east. There are existing residential properties to the north east, west and to the south. The site is separated from the SAC to the south by a distance of over 100 metres but is separated from it by existing residential dwellings and a site, which is currently under construction. No surface watercourses were recorded on the site.

Plate 2-1 Site of proposed development, facing north east

Plate 2-2 Site of proposed development, facing south towards the estuary

2.2.4 Fauna

No evidence of Annex II protected species associated with Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC was recorded within or adjacent to the site boundary. The detailed Conservation Objectives for Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC were reviewed as part of this assessment.

The nearby Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC is designated for the following species

- *Vertigo angustior* (Narrow-mouthed Whorl Snail) [1014]
- *Petromyzon marinus* (Sea Lamprey) [1095]
- *Lampetra fluviatilis* (River Lamprey) [1099]
- *Phoca vitulina* (Harbour Seal) [1365]

There are no watercourses within the proposed development site and no supporting habitat for these species. There is no suitable habitat for *Vertigo angustior* (Narrow-mouthed Whorl Snail) within the proposed development site. Optimal habitat for this species within the SAC is defined as fixed dune and species-rich grassland dominated with a vegetation height of 10-30cm.

No species listed as a Special Conservation Interest species of Cummeen Strand SPA were recorded during the site visit. No significant foraging or roosting habitat for the listed SCI bird species was recorded within the proposed works site boundary, therefore additional dedicated bird surveys were not deemed necessary.

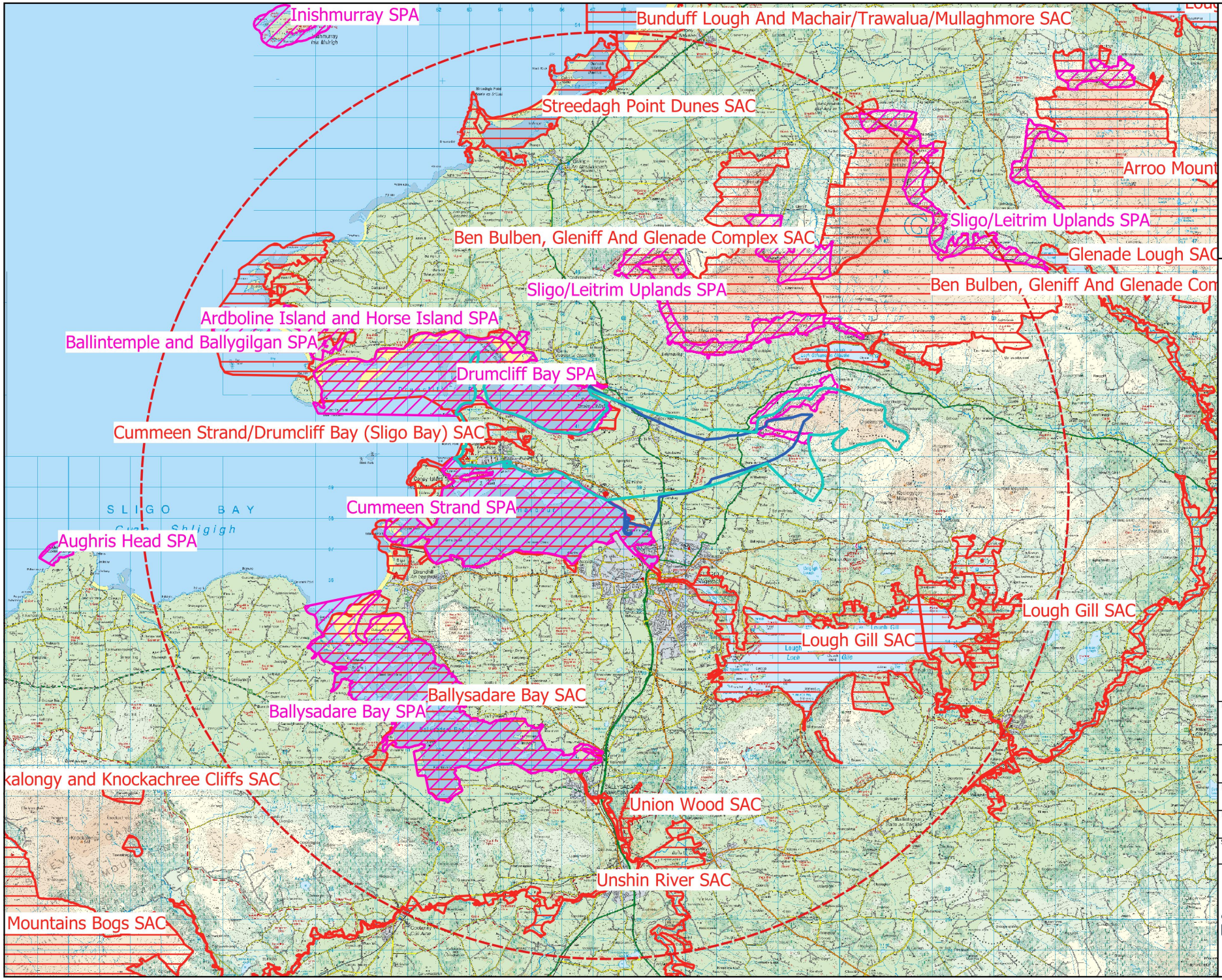
No QI's or SCI's associated any other European site were recorded within or adjacent of the proposed development site boundary.

3. SCREENING ASSESSMENT IDENTIFICATION OF RELEVANT EUROPEAN SITES

3.1 Identification of the European Sites within the Likely Zone of Impact

The following methodology was used to establish which European Sites are within the Likely Zone of Impact of the proposed development:

- Initially the most up to date GIS spatial datasets for European designated sites and water catchments were downloaded from the NPWS website (www.npws.ie) and the EPA website (www.epa.ie) on the 10/12/2019. The datasets were utilized to identify European Sites which could feasibly be affected by the proposed development.
- All European Sites within a distance of 15km surrounding the development site were identified and are shown on Figure 3.1. In addition, the potential for connectivity with European Sites at distances of greater than 15km from the proposed development was also considered in this initial assessment. In this case, no potential connectivity with sites located at a distance of over 15km from the proposed development was identified.
- The catchment mapping was used to establish or discount potential hydrological connectivity between the site of the proposed development and any European Sites. The hydrological catchments are also shown in Figure 3.1.
- In relation to Special Protection Areas, in the absence of any specific European or Irish guidance in relation to such sites, the Scottish Natural Heritage (SNH) Guidance, 'Assessing Connectivity with Special Protection Areas (SPA)' (2016) was consulted. This document provides guidance in relation to the identification of connectivity between proposed development and Special Protection Areas. The guidance takes into consideration the distances species may travel beyond the boundary of their SPAs and provides information on dispersal and foraging ranges of bird species which are frequently encountered when considering plans and projects.
- Table 3.1, provides details of all relevant European Sites as identified in the preceding steps and assesses which are within the likely Zone of Impact. The assessment considers any likely direct or indirect impacts of the proposed development, both alone and in combination with other plans and projects, on European Sites by virtue of the following criteria: size and scale, land-take, distance from the European Site or key features of the site, resource requirements, emissions, excavation requirements, transportation requirements and duration of construction, operation and decommissioning were considered in this screening assessment
- The site synopses and conservation objectives of these sites, as per the NPWS website (www.npws.ie), were consulted and reviewed at the time of preparing this report. Figure 3.1 shows the location of the proposed development in relation to all European sites within 15km of the proposed development.
- Where potential pathways for Significant Effect are identified, the site is included within the Likely Zone of Impact and further assessment is required.



Map Legend

- Site Boundary
- Special Area of Conservation (SAC)
- Special Protection Area (SPA)
- 15km Buffer
- Drumcliffe subcatchment
- Rosses Point groundwater catchment

Drawing Title

EU sites within 15km

Project Title

Maguire Ballincar NIS

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Table 3.1 Identification of Designated sites within the Likely Zone of Impact

European Sites and distance from proposed development	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 10/12/200	Conservation Objectives	Likely Zone of Impact Determination
Special Areas of Conservation (SAC)			
Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC Distance: 120m	• Estuaries [1130] • Mudflats and sandflats not covered by seawater at low tide [1140] • Embryonic shifting dunes [2110] • Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120] • Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] • *Juniperus communis* formations on heaths or calcareous grasslands [5130] • Petrifying springs with tufa formation (Cratoneurion) [7220] • *Vertigo angustior* (Narrow-mouthed Whorl Snail) [1014] • *Petromyzon marinus* (Sea Lamprey) [1095] • *Lampetra fluviatilis* (River Lamprey) [1099] • *Phoca vitulina* (Harbour Seal) [1365]	Detailed conservation objectives for this site, (Version 1, September 2013), were reviewed as part of the assessment and are available at www.npws.ie	The proposed development is located outside the boundary of this SAC and there is no potential for direct effect. Indirect impacts on the following QIs can be ruled out due to the terrestrial nature of the habitats/species, the distance from the proposed works area and the absence of a complete source-pathway-receptor chain: • *Juniperus communis* formations on heaths or calcareous grasslands [5130] • *Vertigo angustior* (Narrow-mouthed Whorl Snail) [1014] The proposed development site lies within an area of moderate groundwater vulnerability (as per the EPA maps). Following a precautionary approach, the construction and operational phase of the proposed residential development may result in pollution to groundwaters via the percolation of polluting materials through the bedrock underlying the site. A potential pathway for indirect effects on the following aquatic QI's species/habitats was identified in the form of deterioration of water quality and supporting habitats for aquatic fauna: • Estuaries [1130] • Mudflats and sandflats not covered by seawater at low tide [1140] • Embryonic shifting dunes [2110] • Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120] • Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] • Petrifying springs with tufa formation (Cratoneurion) [7220] • *Petromyzon marinus* (Sea Lamprey) [1095]

European Sites and distance from proposed development	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 10/12/200	Conservation Objectives	Likely Zone of Impact Determination
			• *Lampetra fluviatilis* (River Lamprey) [1099] • *Phoca vitulina* (Harbour Seal) [1365] **The potential for significant effects on these habitats and species is therefore considered further in this document.**
Lough Gill SAC **Distance:** 3.2km	• 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]	This designated site has the generic conservation objective '*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*' NPWS (2020) Generic Version 7.0.	The proposed development is located outside the boundary of this SAC and there is no potential for direct effect. This SAC is located 3.2km east of the proposed works area. Indirect impacts on the following QIs can be ruled out due to the freshwater/terrestrial nature of the habitats/species, the distance from the proposed works area and the absence of a complete source-pathway-receptor chain: • 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] • *Lampetra planeri* (Brook Lamprey) [1096] The proposed development site lies within an area of moderate groundwater vulnerability (as per the EPA maps). Following a precautionary approach, the construction and operational phase of the proposed residential development may result in pollution to

European Sites and distance from proposed development	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 10/12/200	Conservation Objectives	Likely Zone of Impact Determination
			groundwaters via the percolation of polluting materials through the bedrock underlying the site. A potential pathway for indirect effects on the following aquatic QI species which migrate through the Garavoge Estuary during their life cycle; • *Petromyzon marinus* (Sea Lamprey) [1095] • *Lampetra fluviatilis* (River Lamprey) [1099] • *Salmo salar* (Salmon) [1106] Potential effects on these QI species has been identified in the form of deterioration of water quality and supporting aquatic habitat. **The potential for significant effects on these habitats and species is therefore considered further in this document.**
Ben Bulben, Gleniff And Glenade Complex SAC **Distance:** 5.3km	• Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260] • Northern Atlantic wet heaths with *Erica tetralix* [4010] • European dry heaths [4030] • Alpine and Boreal heaths [4060] • *Juniperus communis* formations on heaths or calcareous grasslands [5130] • Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (* important orchid sites) [6210]	This designated site has the generic conservation objective, '*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*' NPWS (2020) Generic Version 7.0.	The proposed development is located outside the boundary of this SAC and there is no potential for direct effect. This SAC is located 5.3km north-east of the proposed works area. No source-pathway-receptor chain for impact was identified between the site of the proposed works area and the habitats and species for which this site has been designated. Potential for direct or indirect impact on the European Site can be excluded. **This site is not within the likely zone of impact and no further assessment is required.**

European Sites and distance from proposed development	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 10/12/200	Conservation Objectives	Likely Zone of Impact Determination
	• Species-rich *Nardus* grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe) [6230] • Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels [6430] • Transition mires and quaking bogs [7140] • Petrifying springs with tufa formation (Cratoneurion) [7220] • Alkaline fens [7230] • Siliceous scree of the montane to snow levels (*Androsacetalia alpinae* and *Galeopsietalia ladani*) [8110] • Calcareous and calcshist screes of the montane to alpine levels (*Thlaspietea rotundifolii*) [8120] • Calcareous rocky slopes with chasmophytic vegetation [8210] • *Vertigo geyeri* (Geyer's Whorl Snail) [1013] • *Lutra lutra* (Otter) [1355]		
Ballysadare Bay SAC Distance: 7.4km	• Estuaries [1130] • Mudflats and sandflats not covered by seawater at low tide [1140] • Embryonic shifting dunes [2110]	Detailed conservation objectives for this site, (Version 1, November 2013), were reviewed as part of the	The proposed development is located outside the boundary of this SAC and there is no potential for direct effect. This SAC is located 7.4km south of the proposed works area. No source-pathway-receptor chain for impact was identified between the site of the

European Sites and distance from proposed development	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 10/12/200	Conservation Objectives	Likely Zone of Impact Determination
	• Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120] • Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] • Humid dune slacks [2190] • Vertigo angustior (Narrow-mouthed Whorl Snail) [1014] • *Phoca vitulina* (Harbour Seal) [1365]	assessment and are available at www.npws.ie	proposed works area and the habitats and species for which this site has been designated. Potential for direct or indirect impact on the European Site can be excluded. **This site is not within the likely zone of impact and no further assessment is required.**
Unshin River SAC **Distance:** 9.1km	• Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260] • Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (* important orchid sites) [6210] • *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) [6410] • Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0] • *Salmo salar* (Salmon) [1106] • *Lutra lutra* (Otter) [1355]	This designated site has the generic conservation objective, '*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*' NPWS (2020) Generic Version 7.0.	The proposed development is located outside the boundary of this SAC and there is no potential for direct effect. This SAC is located 9.1km south of the proposed works area. No source-pathway-receptor chain for impact was identified between the site of the proposed works area and the habitats and species for which this site has been designated. Potential for direct or indirect impact on the European Site can be excluded. **This site is not within the likely zone of impact and no further assessment is required.**

European Sites and distance from proposed development	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 10/12/200	Conservation Objectives	Likely Zone of Impact Determination
Union Wood SAC Distance: 9.3km	• Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0]	This designated site has the generic conservation objective, '*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*' NPWS (2020) Generic Version 7.0.	The proposed development is located outside the boundary of this SAC and there is no potential for direct effect. This SAC is located 9.3km south of the proposed works area. This site is designated for a terrestrial habitat. No source-pathway-receptor chain for impact was identified between the site of the proposed works area and the habitat for which this site has been designated. Potential for direct or indirect impact on the European Site can be excluded. **This site is not within the likely zone of impact and no further assessment is required.**
Streedagh Point Dunes SAC Distance: 11km	• Mudflats and sandflats not covered by seawater at low tide [1140] • Perennial vegetation of stony banks [1220] • Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] • Mediterranean salt meadows (*Juncetalia maritimi*) [1410] • Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120] • Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] • *Vertigo angustior* (Narrow-mouthed Whorl Snail) [1014]	Detailed conservation objectives for this site, (Version 1, March 2015), were reviewed as part of the assessment and are available at www.npws.ie	The proposed development is located outside the boundary of this SAC and there is no potential for direct effect. This SAC is located 11km north of the proposed works area. No source-pathway-receptor chain for impact was identified between the site of the proposed works area and the habitats/species for which this site has been designated. Potential for direct or indirect impact on the European Site can be excluded. **This site is not within the likely zone of impact and no further assessment is required.**

European Sites and distance from proposed development	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 10/12/200	Conservation Objectives	Likely Zone of Impact Determination
Bunduff Lough And Machair/Trawalua/Mullaghmore SAC Distance: 13.2km	• Mudflats and sandflats not covered by seawater at low tide [1140] • Large shallow inlets and bays [1160] • Reefs [1170] • Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120] • Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] • Humid dune slacks [2190] • Machairs (* in Ireland) [21A0] • *Juniperus communis* formations on heaths or calcareous grasslands [5130] • Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (* important orchid sites) [6210] • Alkaline fens [7230] • *Euphydryas aurinia* (Marsh Fritillary) [1065] • *Petalophyllum ralfsii* (Petalwort) [1395]	Detailed conservation objectives for this site, (Version 1, March 2015), were reviewed as part of the assessment and are available at www.npws.ie	The proposed development is located outside the boundary of this SAC and there is no potential for direct effect. This SAC is located 13.2km north of the proposed works area. No source-pathway-receptor chain for impact was identified between the site of the proposed works area and the habitats/species for which this site has been designated. Potential for direct or indirect impact on the European Site can be excluded. **This site is not within the likely zone of impact and no further assessment is required.**
Special Protection Area (SPA)			

European Sites and distance from proposed development	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 10/12/200	Conservation Objectives	Likely Zone of Impact Determination
Cummeen Strand SPA Distance: 125m	• Light-bellied Brent Goose (*Branta bernicla hrota*) [A046] • Oystercatcher (*Haematopus ostralegus*) [A130] • Redshank (*Tringa totanus*) [A162] • Wetland and Waterbirds [A999]	Detailed conservation objectives for this site, (Version 1, September 2013), were reviewed as part of the assessment and are available at www.npws.ie	The proposed development is located outside the boundary of this SPA and there is no potential for direct effect. The proposed development site lies within an area of moderate groundwater vulnerability (as per the EPA maps). Following a precautionary approach, the construction and operational phase of the proposed residential development may result in pollution to groundwaters via the percolation of polluting materials through the bedrock underlying the site. A potential pathway for indirect effects on the SCI wetland habitat was identified in the form of deterioration of water quality and supporting wetland habitat for the listed SCI species. On a precautionary basis the potential for disturbance to SCI species was also identified. **The potential for significant effects on these SCI habitats and species is therefore considered further in this document.**
Drumcliff Bay SPA Distance: 2km	• Sanderling (*Calidris alba*) [A144] • Bar-tailed Godwit (*Limosa lapponica*) [A157] • Wetland and Waterbirds [A999]	Detailed conservation objectives for this site, (Version 1, September 2013), were reviewed as part of the assessment and are available at www.npws.ie	The proposed development is located outside the boundary of this SPA and there is no potential for direct effect. This SPA is located 2km north of the proposed development site. Given the intervening distance between the proposed development site and this SPA, the potential for habitat loss and disturbance related impacts to the listed SCI populations can be ruled out. Given the distance between the proposed development site and this SPA, there is no potential pathway for impact in the form of deterioration of

European Sites and distance from proposed development	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 10/12/200	Conservation Objectives	Likely Zone of Impact Determination
			water quality during the construction and operational phase, therefore there will be no effect on the 'wetland' habitat. **This site is not within the likely zone of impact and no further assessment is required.**
Sligo/Leitrim Uplands SPA Distance: 5.2km	• Peregrine (*Falco peregrinus*) [A103] • Chough (*Pyrrhocorax pyrrhocorax*) [A346]	This designated site has the generic conservation objective, '*To maintain or restore the favourable conservation condition of the bird species listed as SpecialConservation Interests for this SPA'* NPWS (2020) Generic Version 7.0.	The proposed development is located outside the boundary of this SPA and there is no potential for direct effect. This SPA is located 5.2km north-east of the proposed development site. Given the intervening distance between the proposed development site and this SPA, the potential for disturbance related impacts to SCI populations during construction works can be ruled out. There is no suitable habitat for the listed SCI species of this SPA, therefore the potential for habitat loss can also be ruled out. **This site is not within the likely zone of impact and no further assessment is required.**
Ballintemple and Ballygilgan SPA Distance: 5.3km	• Barnacle Goose (*Branta leucopsis*) [A045]	This designated site has the generic conservation objective, '*To maintain or restore the favourable conservation condition of the bird species listed as SpecialConservation Interests for this SPA'*	The proposed development is located outside the boundary of this SPA and there is no potential for direct effect. This SPA is located 5.3km north-west of the proposed development site. This site lies within the core foraging range of Barnacle goose (core range of 15km, SNH 2016). Barnacle goose may potentially use agricultural grassland for foraging during the winter. However, given the distance of the proposed development site from the SPA and the widespread occurrence of this common habitat in the wider locality, the loss of this habitat within the proposed development site would not have a significant effect on this species.

European Sites and distance from proposed development	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 10/12/200	Conservation Objectives	Likely Zone of Impact Determination
		NPWS (2020) Generic Version 7.0.	**This site is not within the likely zone of impact and no further assessment is required.**
Ballysadare Bay SPA Distance: 7.4km	• Light-bellied Brent Goose (*Branta bernicla hrota*) [A046] • Grey Plover (*Pluvialis squatarola*) [A141] • Dunlin (*Calidris alpina*) [A149] • Bar-tailed Godwit (*Limosa lapponica*) [A157] • Redshank (*Tringa totanus*) [A162] • Wetland and Waterbirds [A999]	Detailed conservation objectives for this site, (Version 1, October 2013), were reviewed as part of the assessment and are available at www.npws.ie	The proposed development is located outside the boundary of this SPA and there is no potential for direct effect. This SPA is located 7.4km south-west of the proposed development site. Given the intervening distance between the proposed development site and this SPA, the potential for habitat loss/disturbance related impacts to the following SCI populations can be ruled out: • Grey Plover (*Pluvialis squatarola*) [A141] • Dunlin (*Calidris alpina*) [A149] • Bar-tailed Godwit (*Limosa lapponica*) [A157] • Redshank (*Tringa totanus*) [A162] This site lies within the core foraging range of Light-bellied Brent Goose (*Branta bernicla hrota*) (core range of 5-8km, SNH 2016). Light-bellied Brent Goose may potentially use agricultural grassland for foraging during the winter. However, given the distance of the proposed development site from the SPA and the widespread occurrence of this common habitat in the wider locality, the loss of agricultural grassland habitat within the proposed development site would not have a significant effect on this species. **This site is not within the likely zone of impact and no further assessment is required.**

European Sites and distance from proposed development	Qualify Interests/Special Conservation Interests for which the European site has been designated (Sourced from NPWS online Conservation Objectives, www.npws.ie on the 10/12/200	Conservation Objectives	Likely Zone of Impact Determination
Ardboline Island and Horse Island SPA Distance: 12km	• Cormorant (*Phalacrocorax carbo*) [A017] • Barnacle Goose (*Branta leucopsis*) [A045]	This designated site has the generic conservation objective, '*To maintain or restore the favourable conservation condition of the bird species listed as SpecialConservation Interests for this SPA'* NPWS (2020) Generic Version 7.0.	The proposed development is located outside the boundary of this SPA and there is no potential for direct effect. This SPA is located 12km north-west of the proposed development site. Given the intervening distance between the proposed development site and this SPA, the potential for habitat loss/disturbance related impacts to the Cormorant SCI population can be ruled out. This site lies within the core foraging range of Barnacle goose (core range of 15km, SNH 2016). The dominant habitat within the proposed development site is agricultural grassland. Barnacle goose may potentially use agricultural grassland for foraging during the winter. However, given the distance of the proposed development site from the SPA and the widespread occurrence of this common habitat in the wider locality, the loss of this habitat within the proposed development site would not have a significant effect on this species. **This site is not within the likely zone of impact and no further assessment is required.**

3.2 European Sites with the Potential to be Significantly Affected by the Proposed Development

The European Sites that are within the Zone of Likely Impact are;

- Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC
- Lough Gill SAC
- Cummeen Strand SPA

3.2.1 Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC

The proposed development site lies within an area of moderate groundwater vulnerability (as per the EPA maps). Following a precautionary approach, the construction and operational phase of the proposed residential development may result in pollution to groundwaters via the percolation of polluting materials through the bedrock underlying the site. A potential pathway for indirect effects on the following aquatic QI's species/habitats was identified in the form of deterioration of water quality and supporting habitats for aquatic fauna:

- Estuaries [1130]
- Mudflats and sandflats not covered by seawater at low tide [1140]
- Embryonic shifting dunes [2110]
- Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120]
- Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]
- Petrifying springs with tufa formation (Cratoneurion) [7220]
- *Petromyzon marinus* (Sea Lamprey) [1095]
- *Lampetra fluviatilis* (River Lamprey) [1099]
- *Phoca vitulina* (Harbour Seal) [1365]

3.2.2 Lough Gill SAC

The proposed development site lies within an area of moderate groundwater vulnerability (as per the EPA maps). Following a precautionary approach, the construction and operational phase of the proposed residential development may result in pollution to groundwaters via the percolation of polluting materials through the bedrock underlying the site. A potential pathway for indirect effects on the following aquatic QI's species was identified in the form of deterioration of water quality and supporting habitats for aquatic fauna:

- *Petromyzon marinus* (Sea Lamprey) [1095]
- *Lampetra fluviatilis* (River Lamprey) [1099]
- *Salmo salar* (Salmon) [1106]

3.2.3 Cummeen Strand SPA

The proposed development site lies within an area of moderate groundwater vulnerability (as per the EPA maps). Following a precautionary approach, the construction and operational phase of the proposed residential development may result in pollution to groundwaters via the percolation of polluting materials through the bedrock underlying the site. A potential pathway for indirect effects on the SCI wetland habitat was identified in the form of deterioration of water quality and supporting habitats for SCI species.

On a precautionary basis the potential for habitat loss and disturbance of the listed SCI species was also identified.

4. ASSESSMENT OF SITES IN THE LIKELY ZONE OF IMPACT

Any likely direct or indirect effects of the proposed development, both alone and in combination with other plans and projects, on European Sites by virtue of the following criteria: size and scale, land-take, distance from the European Site or key features of the site, resource requirements, emissions, excavation requirements, transportation requirements and duration of construction and operation have been considered in this Assessment.

4.1 Assessment with regard to each of the European Sites located within the Likely Zone of Impact

Table 3.1 identified that Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC, Lough Gill SAC, Cummeen Strand SPA, Ballintemple and Ballygilgan SPA, Ballysadare Bay SPA and Ardboline Island and Horse Island SPA are the only sites in the Likely Zone of Impact.

Table 4.1 describes the potential direct and indirect effects on the European Site(s) and the measures that are in place to block any identified effects. It concludes on whether there is any potential for adverse effects on the integrity of the identified European Sites.

European Site	Pathways for Direct Effects	Pathways for Indirect Effects	Mitigation	Potential for adverse effects on the integrity of the European Site
Special Areas of Conservation (SAC)				
Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC) **Distance:** 120m south	The proposed small-scale development is located outside the SAC boundary. There is no potential for any direct effect on the SAC.	Taking a precautionary approach, the only potential pathway identified in Table 3.1 for indirect impact on the SAC is via ground water pathways during the construction and operational stages of the development, potentially affecting the following aquatic QI's species/habitats in the form of deterioration of water quality and supporting habitats for aquatic fauna: • Estuaries [1130] • Mudflats and sandflats not covered by seawater at low tide [1140]	As outlined in Section 2.2.2 of this NIS, a number of best practice mitigation measures for the protection of water quality will be implemented during the construction phase of the development. As described in Section 2.2 of this report the site has been identified as being suitable for a secondary wastewater treatement system and polishing filter. The newly installed WwTP will be operated in accordance with the EPA code of practice. All works associated with the proposed on-site wastewater treatment system to be installed by a suitably	**No potential pathway for adverse effects on the integrity of the site has been identified.**

European Site	Pathways for Direct Effects	Pathways for Indirect Effects	Mitigation	Potential for adverse effects on the integrity of the European Site
		• Embryonic shifting dunes [2110] • Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120] • Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] • Petrifying springs with tufa formation (Cratoneurion) [7220] • *Petromyzon marinus* (Sea Lamprey) [1095] • *Lampetra fluviatilis* (River Lamprey) [1099] • *Phoca vitulina* (Harbour Seal) [1365]	qualified professional. The installation of the wastewater treatment system will be supervised by a chartered engineer at time of installation and installed by an experienced contractor. The wastewater treatment system will be serviced every twelve months and a maintenance agreement will be put in place with tricel. Following the implementation of these measures, no potential pathway for adverse indirect impact via ground water pathways exists and there will be no potential for adverse effect on this EU Designated Site.	
Lough Gill SAC **Distance:** 3.2km east	This SAC is located 3.2km east of the proposed works area. There is no potential for any direct effect on the SAC.	Taking a precautionary approach, the only potential pathway identified in Table 3.1 for indirect impact on the SAC is via ground water pathways during the construction and operational stages of the development, potentially affecting the following aquatic QI species which migrate through the Garavoge Estuary during their life cycle; • *Petromyzon marinus* (Sea Lamprey) [1095] • *Lampetra fluviatilis* (River Lamprey) [1099] • *Salmo salar* (Salmon) [1106] Potential effects on these QI species has been identified in the form of deterioration	As outlined in Section 2.2.2 of this NIS, a number of best practice mitigation measures for the protection of water quality will be implemented during the construction phase of the development. As described in Section 2.2 of this report the site has been identified as being suitable for a secondary wastewater treatement system and polishing filter. The newly installed WwTP will be operated in accordance with the EPA code of practice. All works associated with the proposed on-site wastewater treatment system to be installed by a suitably qualified professional. The installation of the wastewater treatment system will be supervised by a chartered engineer at time of installation and installed by an experienced contractor. The wastewater treatment system will be serviced every twelve months and a maintenance agreement will be put in place with tricel.	**No potential pathway for adverse effects on the integrity of the site has been identified.**

European Site	Pathways for Direct Effects	Pathways for Indirect Effects	Mitigation	Potential for adverse effects on the integrity of the European Site
		of water quality and supporting aquatic habitat.	Following the implementation of these measures, no potential pathway for adverse indirect impact via ground water pathways exists and there will be no potential for adverse effect on this EU Designated Site.	
Special Protection Area (SPA)				
Cummeen Strand SPA	This SPA is located 125m south of the proposed development site. There is no potential for any direct effect on the SPA.	The proposed development site lies within an area of moderate groundwater vulnerability (as per the EPA maps). Following a precautionary approach, the construction and operational phase of the proposed residential development may result in pollution to groundwaters via the percolation of polluting materials through the bedrock underlying the site. A potential pathway for indirect effects on the SCI wetland habitat was identified in the form of deterioration of water quality and supporting habitats for SCI species. On a precautionary basis the potential for habitat loss and disturbance of the listed SCI species was also identified; • Light-bellied Brent Goose (*Branta bernicla hrota*) [A046] • Oystercatcher (*Haematopus ostralegus*) [A130] • Redshank (*Tringa totanus*) [A162] **Habitat loss**	**Water quality** As outlined in Section 2.2.2 of this NIS, a number of best practice mitigation measures for the protection of water quality will be implemented during the construction phase of the development. As described in Section 2.2 of this report the site has been identified as being suitable for a secondary wastewater treatement system and polishing filter. The newly installed WwTP will be operated in accordance with the EPA code of practice. All works associated with the proposed on-site wastewater treatment system to be installed by a suitably qualified professional. The installation of the wastewater treatment system will be supervised by a chartered engineer at time of installation and installed by an experienced contractor. The wastewater treatment system will be serviced every twelve months and a maintenance agreement will be put in place with tricel. Following the implementation of these measures, no potential pathway for adverse indirect impact via ground water pathways exists and there will be no potential for adverse effect on this EU Designated Site. **Disturbance**	**No potential pathway for adverse effects on the integrity of the site has been identified.**

European Site	Pathways for Direct Effects	Pathways for Indirect Effects	Mitigation	Potential for adverse effects on the integrity of the European Site
		The dominant habitat within the proposed development site is agricultural grassland. All of the listed SCI species are principally associated with intertidal mud and sand flat habitat within the SPA, and are reliant on these habitats within the site but are likely to utilise alternative habitats at certain times (e.g. high tide) (NPWS, 2013). Brent geese and oystercatchers may potentially use agricultural grassland for foraging during the winter. However, this habitat is common and widespread in the locality and the loss of this habitat within the proposed development site would not have an adverse effect on the conservation status of this species.	On a precautionary basis the potential for disturbance of the listed SCI species was also identified. The proposed works are set back 125m from the SPA. The site is located in proximity to existing residential housing and is buffered from the SPA by shoreline vegetation, an existing house, and agricultural grassland fields. The proposed works are small scale in nature and require minimal excavations or earthworks during the construction phase. As outlined in Section 2.2.2 of this NIS, a number of best practice disturbance limitation measures will be implemented during the construction phase of the development. No potential pathway for adverse indirect impact via disturbance exists and there will be no potential for adverse effect on this EU Designated Site.	

4.2 Likely Cumulative Impact of the Proposed Development on European Sites, in Combination with other Plans and Projects

A search and review in relation to plans and projects that may have the potential to result in cumulative and/or in-combination impacts on European Sites was conducted. The assessment focuses on the potential for cumulative in-combination effects on the QIs for which potential pathway for impact were identified as Screening Stage. This included a review of online Planning Registers and served to identify past and future plans and projects, their activities and their predicted environmental effects.

4.2.1 Plans

The following plans been reviewed and taken into consideration as part of this assessment:

- National Biodiversity Action Plan 2017-2021
- The Regional Planning Guidelines for the West 2010-2022
- Sligo County Development Plan 2017 - 2023

The review focused on policies and objectives that relate to European sites. None of the objectives reviewed had the potential to result in cumulative adverse effects on any European Site.

4.2.2 Other Plans and Projects

The online planning system for Sligo County Council was consulted on the 10/12/2020. Additional small scale projects were identified in the last 5 years for Ballincar and comprised permissions for the following:

- Permission for the demolition of existing bay window and erection of a new enlarged bay window in the same location on the south facing facade, including associated site works (Planning reference: 14270)
- Permission for development consisting of construction of a single storey dwelling with integrated domestic garage, including installation of an effluent treatment unit and soil polishing filter together with all associated site works (Planning reference: 19127)
- Permission for development consisting of the replacement of the existing septic tank and percolation area which is currently a combined system serving the adjacent dwelling to the west with new proprietary effluent treatment unit and tertiary treatment system serving this dwelling only, together with all associated site works (Planning reference: 1722)
- Permission for development consisting of extensions and alterations to existing dwelling including the following: (a) single storey extension incorporating additional bedroom, interior alterations and granny flat accommodation to the east gable end of the existing dwelling (b) replacement of the existing septic tank and percolation area which is currently a combined system serving the adjacent dwelling to the east with a new septic tank and percolation area serving the dwelling only, together with all associated site works (Planning reference: 1721)
- Permission for development consisting of the construction of a single domestic dwelling, detached garage, on-site wastewater treatment system and percolation area and all associated site works (Planning reference: 17425)
- Permission for proposed works to existing dwelling consisting of (1) demolition of existing single storey flat roofed rear extension, (2) the erection of two new extensions, one to the west (side) & the other to the rear (north) elevations, (3) the reroofing of existing flat roofed extension to the east (side) elevation with a pitched roof to match all new additions and reduce the area of fenestration on the south elevation, (4) demolition of existing rear chimney on roof of main dwelling and its replacement with a Velux roof window, (5) erection of a new

chimney stack to the east elevation of main dwelling, (6) raising the cill level of ground floor window on front elevation to the west of entrance porch, (7) relocation of existing first floor window on west elevation to rear (north) elevation, (8) increasing the height of front boundary wall to 1.5 meters and permission for retention of (9) existing front porch to main dwelling and retention of existing car port to existing rear garage, together with all associated site development works (Planning reference: 14113).

- Permission for development consisting of the following: relocation and upgrading of the existing onsite wastewater treatment system serving the dwelling house and demolition of glass house extension with all associated site works, together with alterations to existing site boundaries (Planning reference: 16487)
- Permission for development consisting of the following: construction of a new two-storey three bedroom dwelling house and onsite wastewater treatment system together with all associated site works including amendments to and retention of existing gateway ((Planning reference: 16488)

4.2.3 Assessment of Cumulative and In-Combination Effects

Following the detailed assessment provided in the preceding sections, it is concluded that, the proposed development will not result in any residual adverse effects on any of the European Sites, their integrity or their conservation objectives when considered on its own. There is therefore no potential for the proposed development to contribute to any cumulative adverse effects on any European Site when considered in-combination with other plans and projects.

In the review of the projects that was undertaken, no connection, that could potentially result in additional or cumulative impacts was identified. Neither was any potential for different (new) impacts resulting from the combination of the various projects and plans in association with the proposed development.

Taking into consideration the reported residual impacts from other plans and projects in the area and the predicted impacts with the current proposal, no residual cumulative impacts have been identified with regard to any European Site.

5. CONCLUDING STATEMENT

This NIS has provided an assessment of all potential direct or indirect adverse effects on European Sites.

Where the potential for any adverse effect on any European Site has been identified, the pathway by which any such effect may occur has been robustly blocked through the use of avoidance, appropriate design and mitigation measures as set out within this report. The measures ensure that the construction and operation of the proposed development does not adversely affect the integrity of European sites.

Therefore, it can be objectively concluded that the Proposed Development, individually or in combination with other plans or projects, will not adversely affect the integrity of any European Site.

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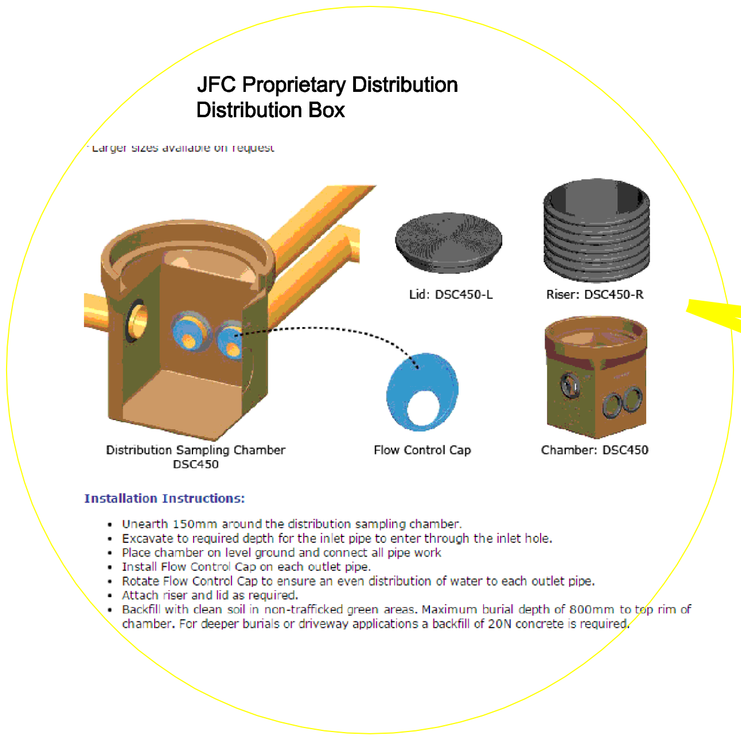
APPENDIX 1

DRAWINGS



42M OF Gravity flow Soil polishing filter layout detail

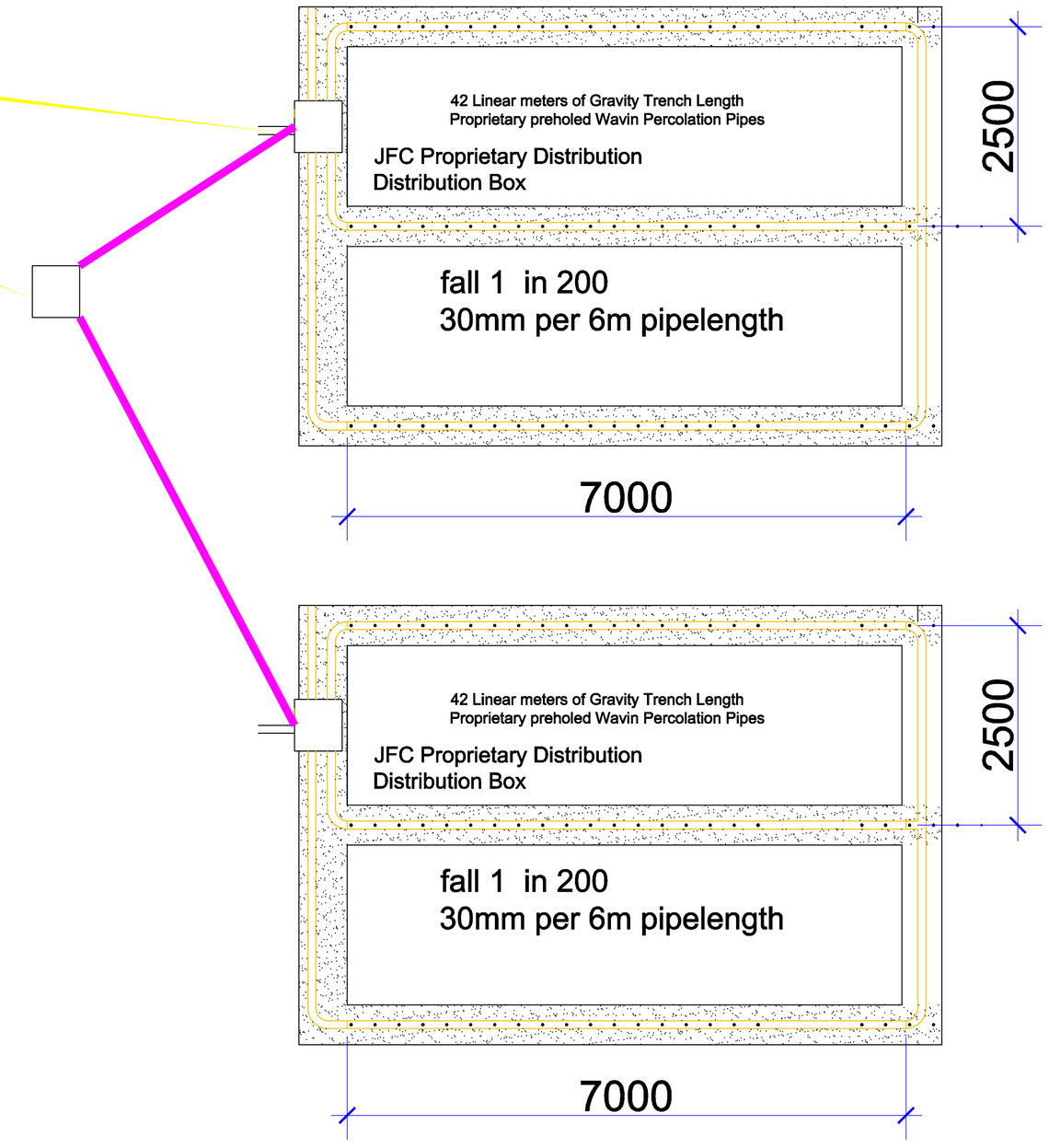


TABLE 7.3. REQUIREMENTS OF A PERCOLATION TRENCH (GRAVITY FED).

Percolation trench characteristics	Requirements
Slope of pipe from tank to distribution box	1 in 40 for earthenware or concrete 1 in 60 for uPVC
Slope of percolation trench from distribution box	1 in 200
Length of percolation pipe in each trench	18 m maximum
Minimum separation distance between percolation trenches	2 m (2.5 m centre to centre)
Diameter of pipe from septic tank to distribution box	100–110 mm
Percolation pipes[1]	100 mm bore, perforated (typically at 4, 6 and 8 o'clock) smooth wall PVC drainage pipes with perforations of 8-mm diameter at about 75-mm centres along the pipe or Pipes with similar hydraulic properties
Width of percolation trench	500 mm
Depth of percolation trench	About 850-mm depth[2] below ground surface depending on site (as per Fig. 7.3)
Backfilling of percolation trench (see Fig. 7.1)	300 mm of 8- to 32-mm washed gravel on invert; pipe laid at a 1 in 200 slope surrounded by 8- to 32-mm clean washed gravel and with 150 mm of similar gravel over pipe; geotextile layer followed by 300 mm topsoil to ground surface
Geotextile	Geotextile should be in accordance with EN ISO 10319
Access/Inspection points and vents	These are recommended for the ends of the percolation pipes; the covers should be visible and installed to prevent entry of water. They may also be used for rodding/scouring purposes

[1]Before installation the holes in the percolation pipe should be inspected to check that they are the correct size and free from debris.
[2]The percolation pipes may be located at a shallower depth, provided that a minimum of 450 mm of material is placed above the pipes to provide the required protection against damage from above (Fig. 7.4).

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PROJECT
Site 4, Ballincar, Strandhill, Sligo, Co Sligo.

Drawing: Percolation Area Details
Scale: 1:50 @ A1 Sheet
Scale: 1:100 @ A3 Sheet
Date: Nov 2020

Drawing: Percolation Area Details **Drawing No:** EJSA 3

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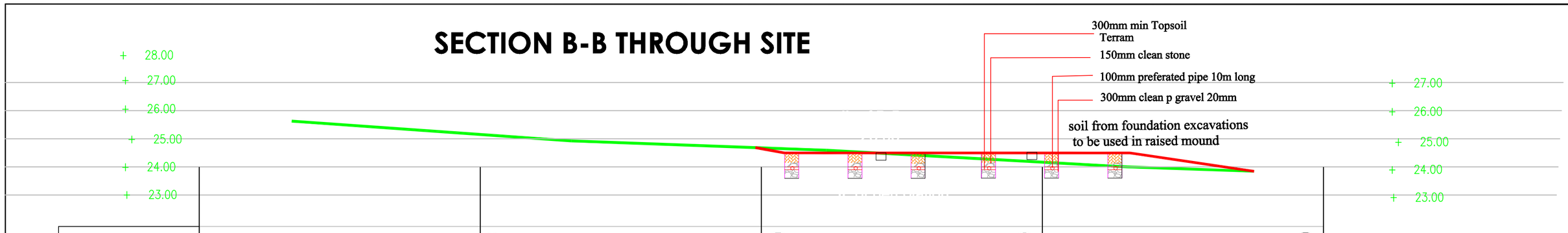
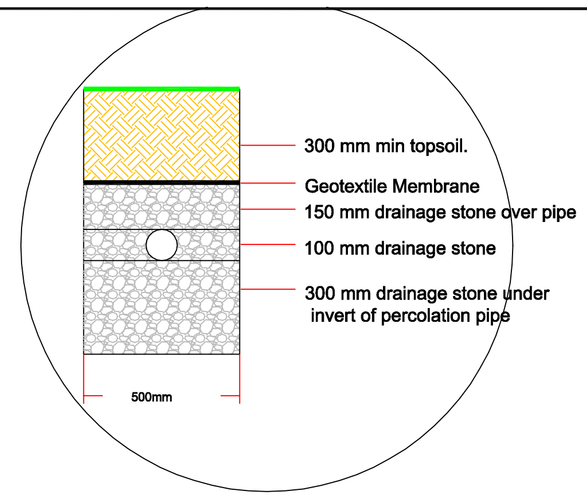
SECTION B-B THROUGH SITE



Chainage	00.000	10.000	20.000	30.000	40.000
Existing Levels	26.0	25.2	24.6	24.2	25.0
Proposed Levels	26.0	25.2	24.6	24.5	25.5
Pipe Invert Levels					



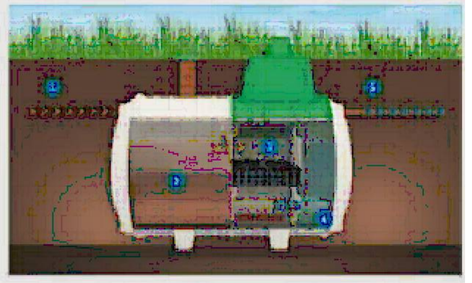
Points to Consider:

The installation location agreed by the local authority and designated on the plans should allow convenient access for routine maintenance and desludging.
The standard location from the house for the system and percolation area are 7m and 10m respectively and at least 10m for both from neighbouring dwellings and 3 to 4m from site boundaries and roadways.
Surface/rainwater must be piped separately and not enter the System.
The depth of dig must accommodate the depth of the outfall pipe to the height of the tank inlet pipe.
Ground type can vary considerably dictating the depth of the compacted hardcore devoid of rocking or point loads ensuring an even weight distribution on the base.
Ground stability soil structure must be assessed for bank support and submersible pump requirements.
Site conditions regard distance to percolation and its level/elevation may necessitate pump usage.
It is also a good idea to provide a mains water tap supply near the tank facilitating future maintenance.
For excess Fats/Oil/Grease a grease separation trap is necessary between the kitchen and sewer line.
The required electric supply to the system is normally buried with the sewer line a 3 core SWA 2.5mm2 cable for standard units and a 7 core for alarmed systems.
Only use qualified certified personnel for all work especially electrical supply and termination.
Check that the certified lifting equipment is free from defect and adequate for the loads and be aware of the hazards of swinging loads.

How a Tricel Novo works

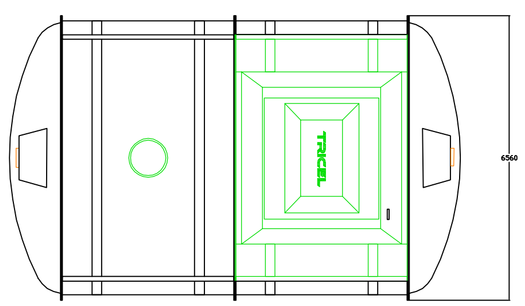
These plants use a simple, proven technology, consisting of 3 treatment zones. In each zone a different stage of the treatment occurs.

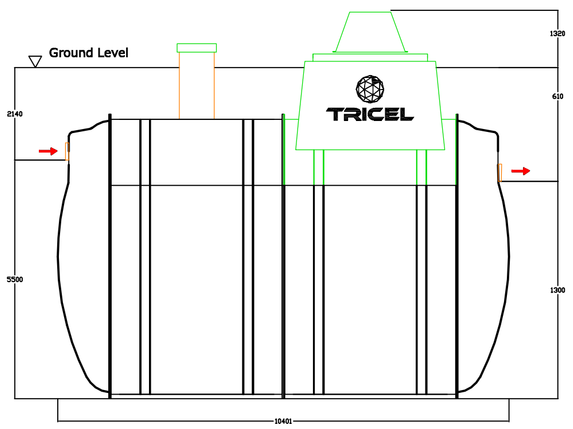
1. Wastewater from the dwelling, toilets, sinks, shower etc., enters the plant.
2. Effluent enters the primary settlement chamber. Settlement occurs when the heavier solids drop out of the wastewater and settle to the bottom of the tank to create sludge, and the lighter solids float to the top of the water to create a scum. The top layer acts as a seal and stops odours escaping. This chamber separates up to 70% of the solids present.
3. Next is the aeration chamber, where masses of naturally occurring bacteria inhabit specially designed plastic filter media. The bacteria feed on the waste removing it from the liquid. A continues supply of air from a low pressure, high volume compressor in the top section of the unit sustains these bacteria. Wastewater passes through the filter media over and over, ensuring a very high treatment efficiency.
4. The liquid then proceeds to the final settlement chamber. Any remaining minute bacterial particles separate from the liquid within this chamber before discharge from the plant. This process slows the liquid's velocity, allowing for any final trace impurities to settle to the bottom of the tank section. A sludge return system then returns these impurities back to the primary settlement chamber.
5. The remaining treated liquid now meets the required standard and is safely passed out of the Tricel Novo plant system. The treated effluent is now ready for discharge to a suitably designed discharge area as required by the relevant local authority.

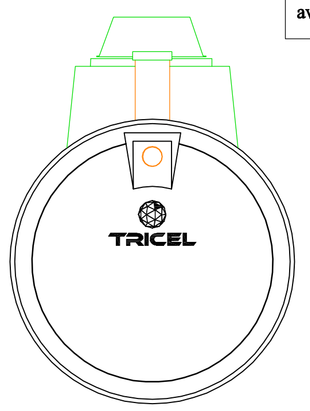


Tricel Novo Wastewater Treatment Plant

TRICEL NOVO 8PE







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PROJECT

Site 4, Ballincar, Strandhill, Sligo, Co Sligo.

Drawing: Section B-B through site AND Tricel Novo Details

Scale: 1:100 @ A1 Sheet
Scale: 1:200 @ A3 Sheet

Date: Nov 2020

Drawing: Section B-B through site AND Tricel Novo Details **Drawing No:** **EJSA 2**

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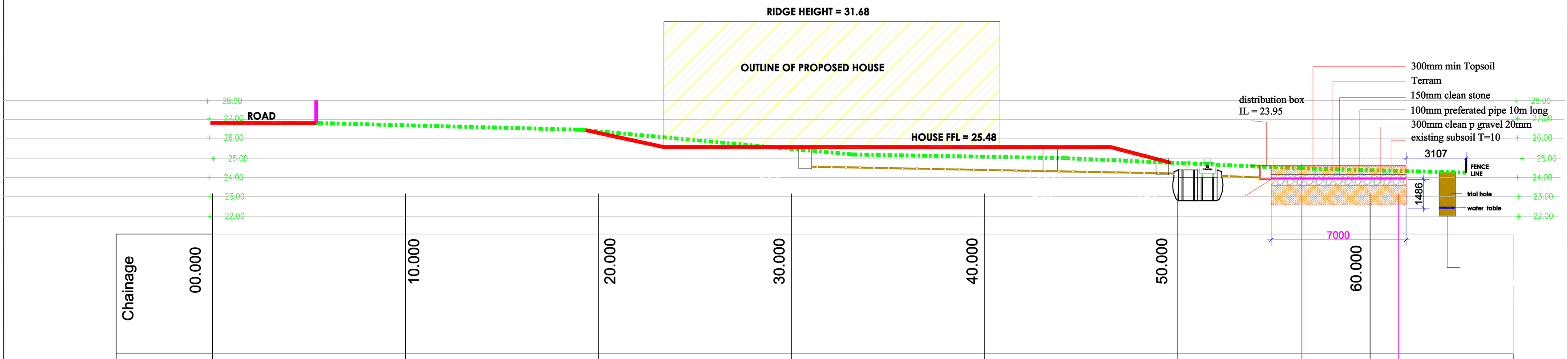
Note This soil Polishing filter to be Photographed at all stages for records.
Note County Council will require Photographic evidence of construction.
JOH Consultant Engineer to be informed of all stages of construction.
N.B. Certificate of Completion and Compliance will not be signed unless Witnessed and Supervised By John O Hara Engineer

GENERAL NOTES
1. Do not scale off this drawing- work to figured dimensions only.
2. This drawing is to be read in conjunction with all relevant Architects, service engineers and John O Hara consultant engineer, drawings.
3. Refer to JOH drawings for overall set out of the building footprint.
4. The main contractor is responsible for the stability of the construction work at all stages.
5. The contractor shall verify all existing conditions and dimensions prior to beginning construction and - or ordering material. any discrepencies shall be brought to the engineers attention immediately.

SECTION A-A THROUGH SITE



Chainage	00.000	10.000	20.000	30.000	40.000	50.000	60.000
Existing Levels	27.0	26.8	26.5	25.5	25.0	24.7	24.2
Proposed Levels	27.0	26.8	26.5	25.5	25.5	24.7	24.5
Pipe Invert Levels				MH 1 = 24.5	MH 2 = 24.3	MH 3=24.2	tricel in IL =24.20 tricel in IL = 24.10 dist box IL=23.95 perc pipe IL=23.92 perc pipe IL=23.9

Drawing: SECTION A-A Drawing No: EJSA 1

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PROJECT
Site 4, Ballincar, Strandhill, Sligo, Co Sligo.

Drawing: Section A-A through site
Scale: 1:100 @ A1 Sheet
Scale: 1:200 @ A3 Sheet
Date: Nov 2020

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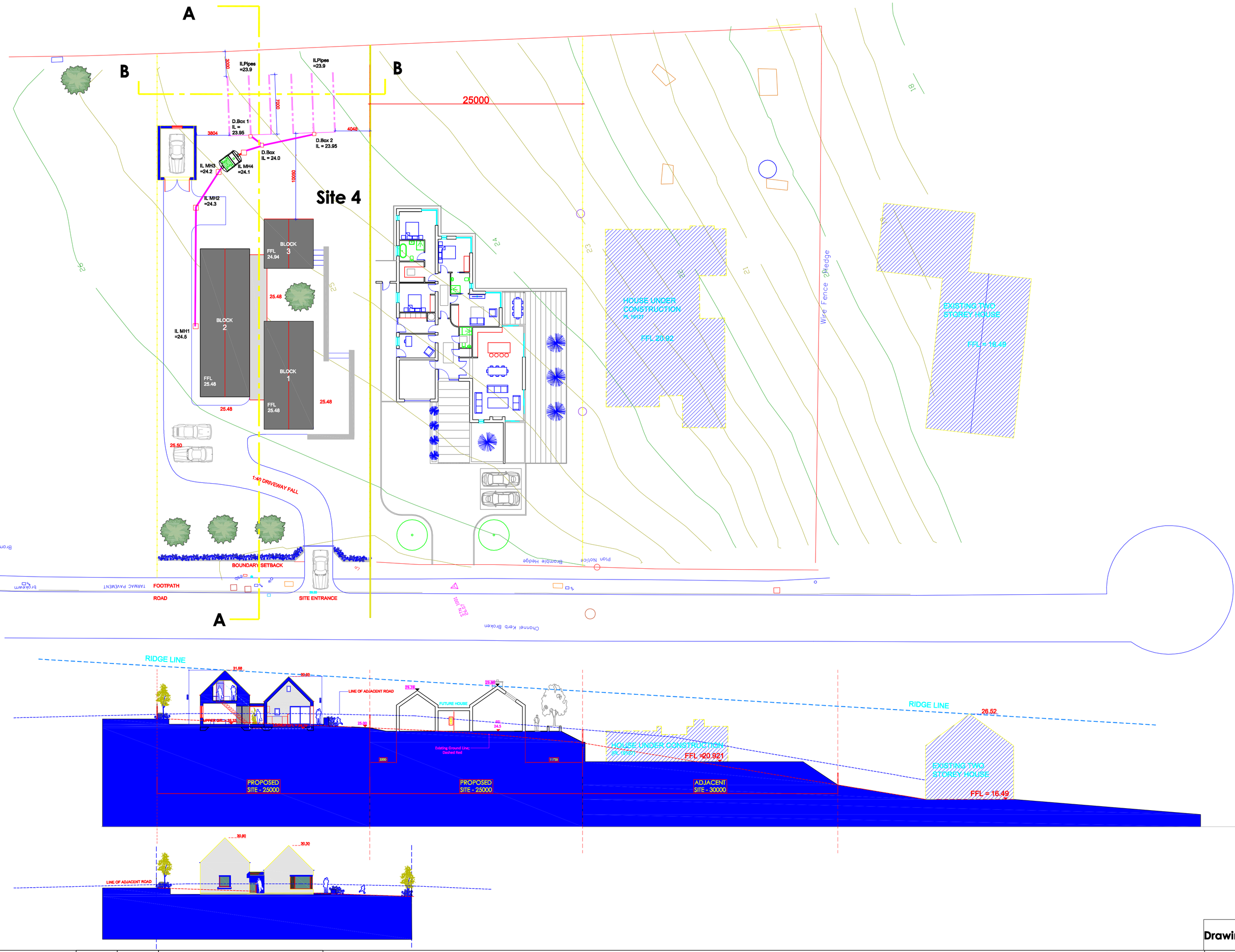

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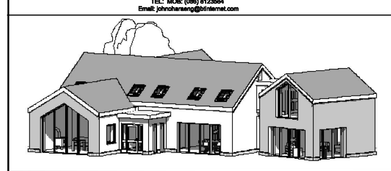

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PROJECT

Site 4, Ballincar, Strandhill, Sligo, Co Sligo.

Drawing: SITE PLAN OF PERCOLATION AREA **Scale:** 1:100 @ A1 Sheet
Scale: 1:200 @ A3 Sheet
Date: Nov 2020

Drawing: SITE PLAN OF PERCOLATION AREA **Drawing No:** EJSA 0

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APPENDIX 2

SITE CHARACTERISATION AND DETAILS OF THE WASTEWATER TREATMENT SYSTEM

Tricel Site Recommendation Report
Tricel Novo Package Plant and Gravity Soil Polishing Filter (Percolation Area)

Date	26/10/2020
Report No:	SA2_XX_7895
Client Name	Knappagh Development LTD
Site Location & Townland	PLOT 4, bALLINCAR, ROSSESPOINT

Thank you for choosing Tricel for your wastewater treatment requirements. This report contains the following information for your site and is based on a population of 7 and a P/T value of between 3-20.

Please see outlined below the accompanying documents:

Section 1: Information on the Tricel Novo Package Plant

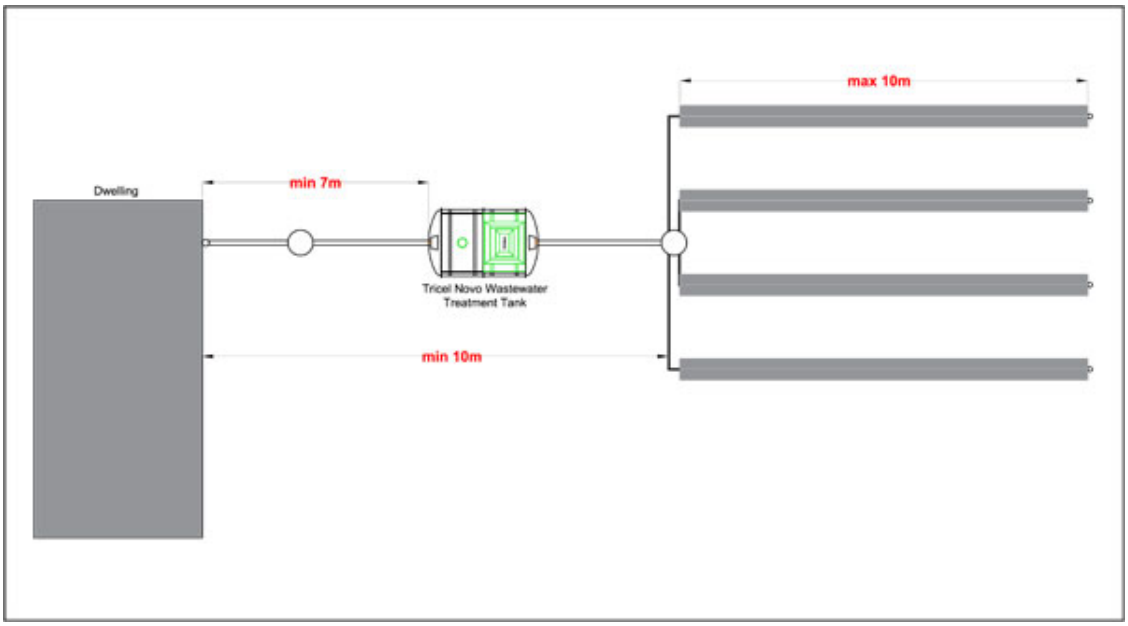
- Manufacturers report and sizing of the Tricel Novo Package Plant
- Drawing of the Tricel Novo Package Plant
- Certification of the selected Tricel Novo Package Plant
- Technical information on the Tricel Novo Package Plant
- Optional maintenance agreement for Tricel Novo Package Plant

Section 2: Information on the percolation area

- Percolation area sizing and outline construction separation distances

Based on the information provided to us, using SR66 and the EPA Code of Practice: Wastewater Treatment and Disposal Systems Serving Single Houses (p.e. ≤ 10), the appropriate solution for treating wastewater on your site is a Tricel Novo wastewater treatment plant followed by a gravity fed soil polishing filter, also called a percolation area. The Tricel Novo provides secondary treatment using submerged aeration filter technology. The gravity fed soil polishing filter consists of a series of pipe work which distribute the effluent for treatment using the in situ subsoil.

Typical layout of a Tricel Novo Package Plant and Gravity Soil Polishing Filter:



For your site we recommend a Tricel Novo IRL8 wastewater treatment plant which is designed to treat a maximum of 1200 litres of wastewater per day. This recommendation is based on the EPA Code of Practice which states the plant selection should be based on a hydraulic loading rate of 150l/per person/per day. The Novo IRL8 has a capacity of 4000 litres, of which 1900 are in the primary chamber, this ensures a long desludging interval. The Tricel Novo range of wastewater treatment plants is fully in conformance with EN12566-3 and complies with SR66.

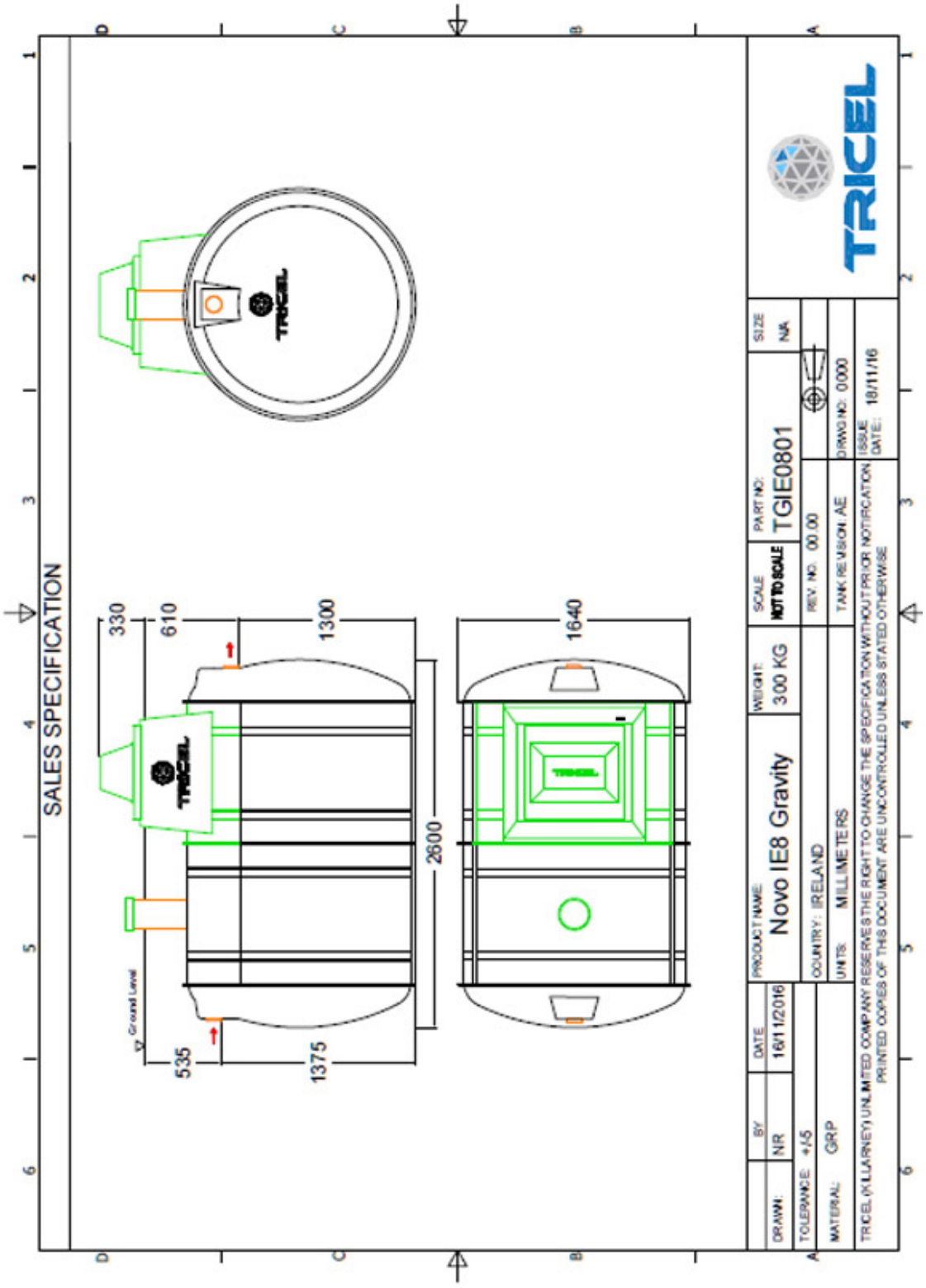
For the soil polishing filter, a minimum of 42m of percolation pipe will be required. The EPA Code of Practice outlines a loading rate on the trench of 50 l/m2/d based on a P/T value of 3-20. It recommends that each percolation trench should be equal in length and no longer than 10m. The percolation pipe is laid in trenches 500mm wide. A Tricel distribution box will be required to split the flow evenly into each trench to ensure even dispersal.

Note:
In the above named site, a substitute wastewater treatment system may not be put in place of the Tricel wastewater treatment system.

This recommendation only applies to the above named site based on the information supplied to Tricel. A Site Characterisation Form should accompany this report. Tricel cannot be responsible for misinformation due to misleading information being received by us from clients.

Please see attached the accompanying documents in Section 1 for the Tricel Novo Package Plant and Section 2 for the percolation area.

Section 1


SALES SPECIFICATION
330
610
1300
1640
2600
535
1375
Ground Level
PRODUCT NAME: Novo IE8 Gravity
WEIGHT: 300 KG
SCALE: NOT TO SCALE
PART NO: TGIE0801
SIZE: N/A
REV NO: 00 00
TANK REVISION: A/E
DRWG NO: 0000
ISSUE DATE: 18/11/16
COUNTRY: IRELAND
UNITS: MILLIMETERS
DRAWN: NR
DATE: 16/11/2016
TOLERANCE: +/-5
MATERIAL: GRP
TRICEL (KILLARNEY) UNLIMITED COMPANY RESERVES THE RIGHT TO CHANGE THE SPECIFICATION WITHOUT PRIOR NOTIFICATION
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Certificate in accordance with SR66 for EN12566-Part 3

Prüfinstitut für Abwassertechnik GmbH

TREATMENT PERFORMANCE RESULTS

Tricel (Killarney)
Ballyspillane Industrial Est., Killarney, Co. Kerry, Ireland

EN 12566-3
Results corresponding to EN 12566-3 and S.R. 66

PIA-SR66-1512-1062

Novo
Submerged fixed film

Nominal organic daily load	0.26 kg/d		
Nominal hydraulic daily load	0.90 m³/d		
Material	Glass reinforced plastic		
Watertightness	Pass		
Structural behaviour (Calculation)	Pass (also wet conditions)		
Durability	Pass		
Treatment efficiency (nominal sequences)		Efficiency	Effluent
	COD	91.6 %	52 mg/l
	BOD_5	95.9 %	11 mg/l
	NH_4-N	79.9 %	8 mg/l
	SS	95.3 %	16 mg/l
Number of desludging	Not more than once		
Electrical consumption	1.1 kWh/d		

Performance tested by:

PIA – Prüfinstitut für Abwassertechnik GmbH
(PIA GmbH)
Hergenrather Weg 30
52074 Aachen, Germany

This document replaces neither the declaration of performance nor the CE marking.

Notified Body No.: 1739

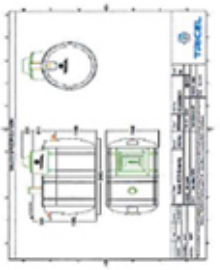
Certified according to ISO 9001:2008

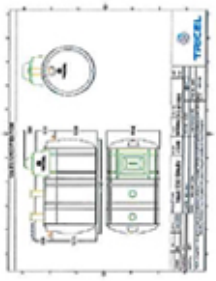
DAkkS Deutsche Akkreditierungsstelle D-PL-17713-01-00

Prüfinstitut für Abwassertechnik GmbH
Geprüft - tested - testé

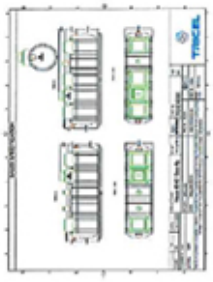
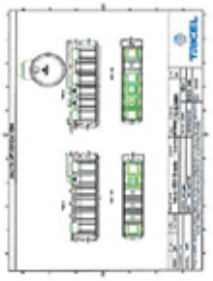
Elmar Lancé July 2016

Novo range and its referring test reports:

Population equivalent (PE)	Drawing of model of the range	Watertightness (EN 12566-3 Annex A)	Treatment Efficiency (EN 12566-3 Annex B)	Structural Behaviour (EN 12566-3 Annex C)	Durability
Initial Type Test (ITT) 6		Pass PIA2009-WD-AT0909-1055 PIA2015-WD/NC-1404-1021.01 PIA2015-WD/NC-1406-1031.01	Pass PIA2010-103B18SBe	Pass For wet ground conditions also, 1.25 m installation depth from inlet invert	Pass PIA2015-DH-1504-1023.01
6		Pass PIA2009-WD-AT0909-1055 PIA2015-WD/NC-1404-1021.01 PIA2015-WD/NC-1406-1031.01	Pass Range conformity according to S.R. 66:2015	Pass For wet ground conditions also, 1.25 m installation depth from inlet invert	Pass PIA2015-DH-1504-1023.01
8		Pass PIA2009-WD-AT0909-1055 PIA2015-WD/NC-1404-1021.01 PIA2015-WD/NC-1406-1031.01	Pass Range conformity according to S.R. 66:2015	Pass For wet ground conditions also, 1.25 m installation depth from inlet invert	Pass PIA2015-DH-1504-1023.01

Population equivalent (PE)	Drawing of model of the range	Watertightness (EN 12566-3 Annex A)	Treatment Efficiency (EN 12566-3 Annex B)	Structural Behaviour (EN 12566-3 Annex C)	Durability
10		Pass PIA2009-WD-AT0909-1055 PIA2015-WD/NC-1404-1021.01 PIA2015-WD/NC-1406-1031.01	Pass Range conformity according to S.R. 66:2015	Pass For wet ground conditions also, 1.25 m installation depth from inlet invert	Pass PIA2015-DH-1504-1023.01
12		Pass PIA2009-WD-AT0909-1055 PIA2015-WD/NC-1404-1021.01 PIA2015-WD/NC-1406-1031.01	Pass Range conformity according to S.R. 66:2015	Pass For wet ground conditions also, 1.25 m installation depth from inlet invert	Pass PIA2015-DH-1504-1023.01
18		Pass PIA2009-WD-AT0909-1055 PIA2015-WD/NC-1404-1021.01 PIA2015-WD/NC-1406-1031.01	Pass Range conformity according to S.R. 66:2015	Pass For wet ground conditions also, 1.25 m installation depth from inlet invert	Pass PIA2015-DH-1504-1023.01

Population equivalent (PE)	Drawing of model of the range	Watertightness (EN 12566-3 Annex A)	Treatment Efficiency (EN 12566-3 Annex B)	Structural Behaviour (EN 12566-3 Annex C)	Durability
24		Pass PIA2009-WD-AT0909-1055 PIA2015-WD/NC-1404-1021.01 PIA2015-WD/NC-1406-1031.01	Pass Range conformity according to S.R. 66:2015	Pass PIA2013-ST-PIT-1303-1018.01 For wet ground conditions also, 1.25 m installation depth from inlet invert	Pass PIA2015-DH-1504-1023.01
30		Pass PIA2009-WD-AT0909-1055 PIA2015-WD/NC-1404-1021.01 PIA2015-WD/NC-1406-1031.01	Pass Range conformity according to S.R. 66:2015	Pass For wet ground conditions also, 1.25 m installation depth from inlet invert	Pass PIA2015-DH-1504-1023.01
36		Pass PIA2009-WD-AT0909-1055 PIA2015-WD/NC-1404-1021.01 PIA2015-WD/NC-1406-1031.01	Pass Range conformity according to S.R. 66:2015	Pass For wet ground conditions also, 1.25 m installation depth from inlet invert	Pass PIA2015-DH-1504-1023.01

Population equivalent (PE)	Drawing of model of the range	Watertightness (EN 12566-3 Annex A)	Treatment Efficiency (EN 12566-3 Annex B)	Structural Behaviour (EN 12566-3 Annex C)	Durability
42		Pass PIA2009-WD-AT0909-1055 PIA2015-WD/NC-1404-1021.01 PIA2015-WD/NC-1406-1031.01	Pass Range conformity according to S.R. 66:2015	Pass For wet ground conditions also, 1.25 m installation depth from inlet invert	Pass PIA2015-DH-1504-1023.01
50		Pass PIA2009-WD-AT0909-1055 PIA2015-WD/NC-1404-1021.01 PIA2015-WD/NC-1406-1031.01	Pass Range conformity according to S.R. 66:2015	Pass For wet ground conditions also, 1.25 m installation depth from inlet invert	Pass PIA2015-DH-1504-1023.01


Tricel® Novo
For Single Dwellings & Small Communities
Innovative design for superior performance
CE
Certified to EN12566-3
TRICEL
ENVIRONMENTAL

What is the Tricel Novo

Tricel Novo wastewater treatment plants are reliable, easy to install and simple to maintain for all wastewater requirements. These highly functional plants can cater for ranges from 1 to 50 PE (population equivalents).

The Tricel Novo submerged aeration plant is suitable for domestic and light commercial or communal applications and uses simple proven fixed bed technology. Each system comprises of 3 independent treatment zones, all fulfilling a different stage of the purification process.

European Certification Requirements

All Tricel wastewater treatment plants have been tested to European certification EN 12566–3 and comply with the requirements of S.R. 66:2015. This certification tests all plants for strength, water tightness, durability and treatment efficiency.

By using a wastewater treatment plant which is CE certified clients can rest assured that it has complied with tests and inspections which guarantee a high level of security and efficiency.

How a Tricel Novo works

These plants use a simple, proven technology, consisting of 3 treatment zones. In each zone a different stage of the treatment occurs.

1. Wastewater from the dwelling, toilets, sinks, shower etc., enters the plant.
2. Effluent enters the primary settlement chamber. Settlement occurs when the heavier solids drop out of the wastewater and settle to the bottom of the tank to create sludge, and the lighter solids float to the top of the water to create a scum. The top layer acts as a seal and stops odours escaping. This chamber separates up to 70% of the solids present.
3. Next is the aeration chamber, where masses of naturally occurring bacteria inhabit specially designed plastic filter media. The bacteria feed on the waste removing it from the liquid. A continues supply of air from a low pressure, high volume compressor in the top section of the unit sustains these bacteria. Wastewater passes through the filter media over and over, ensuring a very high treatment efficiency.
4. The liquid then proceeds to the final settlement chamber. Any remaining minute bacterial particles separate from the liquid within this chamber before discharge from the plant. This process slows the liquid's velocity, allowing for any final trace impurities to settle to the bottom of the tank section. A sludge return system then returns these impurities back to the primary settlement chamber.
5. The remaining treated liquid now meets the required standard and is safely passed out of the Tricel Novo plant system. The treated effluent is now ready for discharge to a suitably designed discharge area as required by the relevant local authority.

Tricel Novo Wastewater Treatment Plant

Key features & benefits

- Compression moulded SMC tank. The compression moulding process is one of the most technologically developed processes available to manufacture structural composites. Components are manufactured under heat and high pressure and have unrivalled strength and durability over standard GRP tanks or PE tanks.
- SMC is unique in the wastewater treatment industry with Tricel SMC tanks operating in some of the harshest climatic conditions for over 50 years with no defects.
- Tricel's ceramic diffuser is unique in the domestic wastewater treatment plant market and will last twice as long as all standard competitors rubber equivalents. This saves money in both call out fees and replacement parts.
- No concrete backfill for installation on most sites saving up to €400 over lower quality grp/plastic competitors.
- No moving parts or pumps in the plant ensuring reliable operation and minimal maintenance and repair costs.
- Tricel Novo plants are designed with a shallow invert to reduce both installation and time costs

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Homeowners: Individual domestic installation

The lightweight nature of the system makes for easy on-site delivery.

No need for big excavators and large holes that disrupt and disturb your garden.

Very low visual impact from fully installed units.

Larger projects: Commercial installations up to 50PE

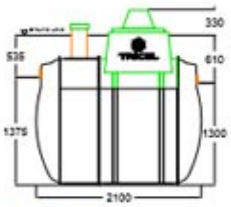
These units are suitable for installation at housing estates, camping sites, hotels etc., and have low maintenance and running costs.

Each WWTP unit is constructed of lightweight SMC and is easy to maneuver which simplifies the installation process.

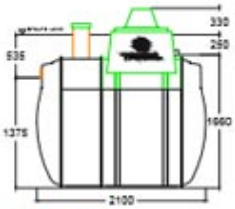
Example of a fully installed 50PE Novo wastewater treatment unit in a 5-star hotel.

Technical characteristics/ Plant dimensions

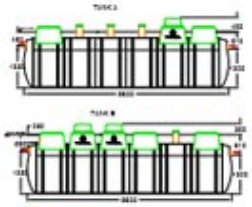
Novo Design Population		No. of people	Length	Width	Height	Nominal inlet/ outlet diameter	Weight empty	Inlet invert to base	Outlet invert to base	Inlet invert to ground level	Air blower rating
			m			mm	kg	m			watts
IE6		1-6	2.1	1.64	2.24	110	270	1.375	1.3	0.535	60
IE6+[a]		2-6	2.6	1.64	2.24	110	300	1.375	1.3	0.535	60
IE8		2-8	2.6	1.64	2.24	110	300	1.375	1.3	0.535	80
IE10		3-10	3.1	1.64	2.24	110	370	1.375	1.3	0.535	80
IE12		4-12	3.6	1.64	2.27	110	400	1.375	1.3	0.535	100
IE18		6-18	4.6	1.64	2.27	110	500	1.375	1.3	0.535	200
IE24		8-24	6.6	1.64	2.27	150	700	1.35	1.3	0.56	200
IE30	Tank A	10-30	2.6	1.64	1.99	150	300	1.35	1.3	0.46	
	Tank B		5.6	1.64	2.27	150	600	1.35	1.3	0.56	200 + 80
IE36	Tank A	12-36	3.6	1.64	1.99	150	400	1.35	1.3	0.46	
	Tank B		6.6	1.64	2.27	150	700	1.35	1.3	0.56	200 + 80
IE42	Tank A	14-42	5.6	1.64	2.27	150	600	1.35	1.3	0.46	
	Tank B		5.6	1.64	2.27	150	600	1.35	1.3	0.56	200 x 2
IE50	Tank A	16-50	6.6	1.64	2.27	150	700	1.35	1.3	0.46	
	Tank B		6.6	1.64	2.27	150	700	1.35	1.3	0.56	200 + 120 + 80



IE6 gravity outlet
Up to 6PE domestic gravity flow outlet.



IE6 pumped outlet
1-6 domestic pumped unit. Suitable for pumping to a raised discharge area (over).



Gravity IE50 outlet
Suitable for commercial installation, caters for up to 50 people.

Tricel Novo riser options for deep installation

Tricel offer 3 different manhole riser heights to suit different invert/inlet levels. Manhole risers allow for the positioning of the treatment plants at the depth which is optimum to each individual installation.Wastewater is gravity fed from the home to your treatment plant. The inlet pipe's position from the premises determines the excavation depth for the WWT plant. Tricel offer a choice of manhole risers 250mm/500mm/750mm to help with installation where site conditions require a flexible solution.

Tricel Group

Tricel is an established and world recognised global provider of **high performance solutions** for the **Construction, Environmental, Water and Materials Industries** and is a brand built upon service, back up and reliability.

We occupy a unique position in the field of reinforced plastics, combining the technical expertise of **over 40 years in the press-moulding and composites industry.** Tricel is proud of being one of the largest manufacturers of Wastewater Treatment plants in Europe, and are regarded by regulators as the standard setters within the industry.

Tricel are **experts in Sheet Moulding Compound (SMC)** processes and produce the only wastewater treatment plant in Europe constructed from this material. This process gives the highest strength to thickness ratio of any tank on the market, and has no risk of corrosion over time.

Our company offers industry **leading innovative solutions** that our customers can trust, and with manufacturing locations in 5 countries we supply a comprehensive range of products to **over 50 countries worldwide.**

Membership of European governing bodies on wastewater treatment

The Tricel Environmental Waste Water Treatment Plants are fully tested and accredited to **European standards for CE certification**. PIA (Prüfinstitut für Abwassertechnik GmbH) are the leading Test Institute in Europe for wastewater technology.
Tricel Wastewater treatment plants meet with **EN12566-3** requirements which test both the quality of the components as well as the overall performance of the plant.

IRISH WATER

The **Irish Water Treatment Association (IWTA)** is the national association for the treatment, conservation, recycling and reuse of water and wastewater.

iowa

The **Irish Onsite Wastewater Association (IOWA)** formed in 2007 with the goal of improving the standard of professionalism in the on-site treatment of wastewater in Ireland.

WARRANTY

- The warranty period for **mechanical parts** within the products is **12 months** from the date of purchase. This includes the compressor, control panel, ceramic diffuser and all internal components.
- The SMC structure of the tanks carry a **10 year warranty** from date of purchase.
- All products are **CE certified to EU safety**, health and environmental requirements.

All warranties are subject to correct installation and use of the product, including maintenance as per manufacturer guidelines

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In accordance with Tricel's normal policy of product development these specifications are subject to change without notice.
Tricel (Killarney) Unlimited Company trading as Tricel

TRICEL

Tricel Novo: Wastewater Treatment System

Service Agreement

Establishing a regime of yearly inspections and maintenance is advised to ensure that your Tricel Novo continues to perform to the same high standards throughout its lifetime. The service agreement covers travel, the service and the labour cost of servicing only. Other labour costs are excluded, as are all replacement parts.

Tricel (Killarney) Unlimited Company, Ballyspillane Industrial Estate, Killarney, Co. Kerry, V93 X253, Ireland ("the Company") enter this Tricel Novo service agreement with the Customer named below:

Customer Details:			
Name:			
Address:		Address of Site: (If other)	
Telephone No.:			
Date of Tricel Novo Order:			
Work Order No.:			
Date of Delivery of Tricel Novo:			
Date of System Commissioning:			
Service Agreement Fee Paid:			
Date of Service Agreement Commencement:			
Unit Serial No.:			

During routine servicing, the service technician will perform a series of checks and procedures:

Checks:

- The air-diffuser is monitored to check for sufficient dispersion of air.
- The sludge return system is functioning correctly.
- The covers and locks are in place and in good condition.
- General appearance and condition of the treatment system is good.

Procedures:

- The blower is tested.
- The blower filter is replaced.
- The system alarm is tested.
- The pump and float-switch are tested (If applicable).
- The vents are cleared of any blockages.
- The sludge level in the primary chamber is measured.

Notes:

- Full inspection labour is covered (including any immediate minor system adjustment required). This service agreement does not cover the cost of any labour or materials that may arise as a result of this inspection.
- Components that require replacing will incur additional charges.
- All service agreements exclude de-sludging.

Tricel (Killarney) Unlimited Company trading as Tricel.

March 2017

Service Agreement Options:

TICK THE SERVICE AGREEMENT OPTION YOU WISH TO AVAIL OF: (Please tick one option only)	
Single Service: One standard scheduled visit to service the system	☐
Single service & one emergency breakdown service *: One standard scheduled visit to service the system & one emergency breakdown visit if required	☐
Three-year service: One scheduled visit to service the system per year, for 3 years.	☐
Five-year service: One scheduled visit to service the system per year, for 5 years.	☐

* Unused emergency breakdown cover fees cannot be refunded if a breakdown does not materialise.

Note: In cases in which multiple service agreements have been purchased by a customer for individual components of a complete wastewater treatment plant, i.e. a Tricel Novo, Tricel Puraflo or Sandcel - a discount will apply.

This contract is subject to terms & conditions. For Terms & Conditions, please contact Tricel:

Tricel (Killarney) Unlimited Company, Ballyspillane Industrial Estate, Killarney, Co. Kerry, V93 X253, Ireland.
Tel: +353 (0)64 6632421 Fax: +353 (0)64 6632777
Email: sales@tricel.ie | Web: www.tricel.ie

This service agreement relates only to the Tricel Novo, manufactured by Tricel, its subsidiaries and associated companies, and is between the company, or person named in this document, & Tricel.

By signing the declaration below, I hereby acknowledge that I, the Customer, have read, understand and agree to the information in the Novo Technical Manual, this service agreement and also the relevant terms & conditions.

Tricel agrees to provide the services listed on this service agreement subject to the terms and conditions:	*Please supply the services listed on this service agreement subject to the terms and conditions:*
Signed on behalf of the Company:	*Signed by the Customer:*
Name (Block Capitals):	Name (Block Capitals):
Signature:	Signature:
Date:	Date:

Important: Original signed service agreements must be returned to Tricel with payment in full and in advance, in order for the service agreements to be initiated. You are reminded of your obligations to the relevant County Council.

Tricel (Killarney) Unlimited Company trading as Tricel.

March 2017

Section 2

The design and construction of the polishing filter is the responsibility of the site engineer. A full site layout drawing should accompany this report.
The EPA CoP 2009 outlines the design, siting and construction requirements for polishing filters.
The tables below outline some of the key factors to take into consideration when designing and locating a polishing filter.

TABLE 6.1. MINIMUM SEPARATION DISTANCES IN METRES.

	Septic tank, intermittent filters, packaged systems, percolation area, polishing filters (m)
Wells[1]	–
Surface water soakaway[2]	5
Watercourse/stream[3]	10
Open drain	10
Heritage features, NHA/SAC[3]	–
Lake or foreshore	50
Any dwelling house	7 septic tank 10 percolation area
Site boundary	3
Trees[4]	3
Road	4
Slope break/cuts	4

[1]See Annex B: *Groundwater Protection Response.*
[2]The soakaway for surface water drainage should be located down gradient of the percolation area or polishing filter and also ensure that this distance is maintained from neighbouring storm water disposal areas or soakaways.
[3]The distances required are dependent on the importance of the feature. Therefore, advice should be sought from the local authority environment and planning sections (conservation officer and heritage officer) and/or from the Department of the Environment, Heritage and Local Government (DoEHLG), specifically the Archive Unit of the National Monuments Section and the National Parks and Wildlife Service. If considering discharging to a watercourse that drains to an NHA/SAC the relevant legislation is Article 63 of the Habitats Directive. (NHA, National Heritage Area; SAC, Special area of Conservation.)
[4]Tree roots may lead to the generation of preferential flow paths. The canopy spread indicates potential root coverage.

Table 6.1 EPA CoP 2009- Minimum separation distances

TABLE 10.1. MINIMUM SOIL POLISHING FILTER AREAS AND PERCOLATION TRENCH LENGTHS REQUIRED FOR A FIVE-PERSON HOUSE.

P/T-values[1]	Direct and pumped discharge (Options 1 and 2)		Percolation trench discharge (500 mm wide) (Option 3)	
	Loading rate on plan area (l/m²/day)	Area required for five persons (m²)	Loading rate on trench area (l/m²/day)	Trench length required for five persons (m)
3–20	≤20	≥37.5	≤50	≥30
21–40	≤10	≥75	≤25	≥60
41–50	≤5	≥150	≤25	≥60
51–75	≤3	≥250	≤16	≥94

[1]The loading rate is dependent on the percolation rate and in the case of an imported mound then the higher of the P-value of the *in-situ* subsoil and of the imported material should be used to size the polishing filter.

Table 10.1 from EPA CoP 2009 - Loading rates for gravity fed soil polishing filter

TABLE 7.3. REQUIREMENTS OF A PERCOLATION TRENCH (GRAVITY FED).

Percolation trench characteristics	Requirements
Slope of pipe from tank to distribution box	1 in 40 for earthenware or concrete 1 in 60 for uPVC
Slope of percolation trench from distribution box	1 in 200
Length of percolation pipe in each trench	18 m maximum
Minimum separation distance between percolation trenches	2 m (2.5 m centre to centre)
Diameter of pipe from septic tank to distribution box	100–110 mm
Percolation pipes[1]	100 mm bore, perforated (typically at 4, 6 and 8 o'clock) smooth wall PVC drainage pipes with perforations of 8-mm diameter at about 75-mm centres along the pipe or Pipes with similar hydraulic properties
Width of percolation trench	500 mm
Depth of percolation trench	About 850-mm depth[2] below ground surface depending on site (as per Fig. 7.3)
Backfilling of percolation trench (see Fig. 7.1)	300 mm of 8- to 32-mm washed gravel on invert; pipe laid at a 1 in 200 slope surrounded by 8- to 32-mm clean washed gravel and with 150 mm of similar gravel over pipe; geotextile layer followed by 300 mm topsoil to ground surface
Geotextile	Geotextile should be in accordance with EN ISO 10319
Access/Inspection points and vents	These are recommended for the ends of the percolation pipes; the covers should be visible and installed to prevent entry of water. They may also be used for rodding/scouring purposes

[1]Before installation the holes in the percolation pipe should be inspected to check that they are the correct size and free from debris.
[2]The percolation pipes may be located at a shallower depth, provided that a minimum of 450 mm of material is placed above the pipes to provide the required protection against damage from above (Fig. 7.4).

Table 7.3 EPA CoP 2009 - Construction of percolation trenches. For secondary treated waste water the maximum length of percolation pipe in each trench should be 10m as outlined in section 10.1.1 option 3

For further information in relation to percolation area design please refer to the EPA Code of Practice: Wastewater Treatment and Disposal Systems Serving Single Houses (p.e. ≤ 10)

Terms and conditions:

Tricel cannot accept responsibility for incorrect site details or calculations as these are based on user inputs which are outside of Tricel control.
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SITE CHARACTERISATION FORM
COMPLETING THE FORM

Step 1:

Goto Menu Item **File, Save As** and save the file under a reference relating to the client or the planning application reference if available.

Use the **Clear Form** button to clear all information fields.

Notes:

All calculations in this form are automatic.

Where possible information is presented in the form of drop down selection lists to eliminate potential errors.

Variable elements are recorded by tick boxes. In all cases only one tick box should be activated.

All time record fields must be entered in twenty hour format as follows: HH:MM

All date formats are DD/MM/YYYY.

All other data fields are in text entry format.

This form can be printed out fully populated for submission with related documents and for your files. It can also be submitted by email.

Section 3.2

In this section use an underline _____ across all six columns to indicate the depth at which changes in classification / characteristics occur.

Section 3.4

Lists supporting documentation required.

Section 4

Select the treatment systems suitable for this site and the discharge route.

Section 5

Indicate the system type that it is proposed to install.

Section 6

Provide details, as required, on the proposed treatment system.

APPENDIX B: SITE CHARACTERISATION FORM

File Reference:

1.0 GENERAL DETAILS (From planning application)

Prefix: First Name: Knappagh Development LTD Surname:

Address: thomas street, Sligo co sligo.

Site Location and Townland: site 4 at Ballincar, Rossespoint, Sligo.

Telephone No: 087 6701113 Fax No:

E-Mail: johnoharaeng@btinternet.com

Maximum no. of Residents: 7 No. of Double Bedrooms: 4 No. of Single Bedrooms: 1

Proposed Water Supply: Mains ✔ Private Well/Borehole Group Well/Borehole

2.0 GENERAL DETAILS (From planning application)

Soil Type, (Specify Type): tills derived mainly from namurian rock

Aquifer Category: Regionally Important Rk Locally Important Poor

Vulnerability: Extreme High Moderate ✔ Low High to Low Unknown

Bedrock Type: namurian rock

Name of Public/Group Scheme Water Supply within 1 km: none

Groundwater Protection Scheme (Y/N): No Source Protection Area: SI SO

Groundwater Protection Response: R1

Presence of Significant Sites (Archaeological, Natural & Historical): none

Past experience in the area: good conditions generally

Comments:

(Integrate the information above in order to comment on: the potential suitability of the site, potential targets at risk, and/or any potential site restrictions).

Ground water protection response is R1
which is Acceptable subject to normal good practice (i.e system selection, construction, operation and maintenance in accordance with EPA 2000).
groundwater and surface water at risk, site is not adjacent to an area of flooding.site is classified as moderate vunerability and aquifer catagery is Rkc.

Note: Only information available at the desk study stage should be used in this section.

3.0 ON-SITE ASSESSMENT

3.1 Visual Assessment

Landscape Position: RURAL -VILLAGE SETTING ON AGRICULTURAL LAND

Slope: Steep (>1:5) ☐ Shallow (1:5-1:20) ☑ Relatively Flat (<1:20) ☐

Surface Features within a minimum of 250m (Distance To Features Should Be Noted In Metres)

Houses: 50m SOUTH and 150M NORTH, 50M EAST and 50m west of proposed percolation area.

Existing Land Use: AGRICULTURAL

Vegetation Indicators: GRASS with no signs of rushes or wet ground

Groundwater Flow Direction: north to south

Ground Condition: HARD UNDER FOOT

Site Boundaries: hedges to east of site , private road to west of site and site is bound by a houses boundary to north and south.

Roads: LANE-ROAD TO WEST OF SITE.

Outcrops (Bedrock And/Or Subsoil): NO OUTCROPS APARENT.

Surface Water Ponding: none Lakes: Lough CONN 1.1km NORTH of site

Beaches/Shellfish: TIDAL BEACH 150M SOUTH OF SITE Areas/Wetlands: NONE

Karst Features: none

Watercourse/Stream*: STREAM WITHIN 200M OF SITE

Drainage Ditches*: none

Springs / Wells*: NONE

Comments:
(Integrate the information above in order to comment on: the potential suitability of the site, potential targets at risk, the suitability of the site to treat the wastewater and the location of the proposed system within the site).

the site is on a gently sloping ground. there are no rivers-streams within the min distances set out in the EPA manual.
the ground is dry under foot and no signs of any wetland plants. THERE IS A TIDAL BAY 150m south of proposed site but again this is outside minimum required distances as laid out in EPA manual.

***Note and record** water level

3.2 **Trial Hole** (should be a minimum of 2.1m deep (3m for regionally important aquifers))

To avoid any accidental damage, a trial hole assessment or percolation tests should not be undertaken in areas, which are at or adjacent to significant sites (e.g. NHAs, SACs, SPAs, and/or Archaeological etc.), without prior advice from National Parks and Wildlife Service or the Heritage Service.

Depth of trial hole (m): 2.40

Depth from ground surface to bedrock (m) (if present): 2.40

Depth from ground surface to water table (m) (if present): 2.00

Depth of water ingress: 0.40

Rock type (if present): Limestone

Date and time of excavation: 16/10/2020 10:00

Date and time of examination: 17/10/2020 10:00

	Depth of P/T Test*	Soil/Subsoil Texture & Classification**	Plasticity and dilatancy***	Soil Structure	Density/ Compactness	Colour****	Preferential flowpaths
0.1 m		Topsoil SILT CLAY	Dilatant, 2 nr threads ,8,8 ribbons<80,80mm, ,70 mm	crumb	compact	brown-BLACK	grass routes
0.2 m							
0.3 m							
0.4 m	P test						
0.5 m		----------	----------	----------	----------	----------	----------
0.6 m							random small cobbles
0.7 m							
0.8 m							
0.9 m			Dilatant NO 1 nr threads ,10 ribbons<50mm,				
1.0 m							
1.1 m	T Test						
1.2 m							
1.3 m						grey brown	
1.4 m		gravel with clay and small stones		GRANULAR	FIRM		
1.5 m							gravel, cobbles
1.6 m							
1.7 m							
1.8 m		++++++++++++WT					
1.9 m			++++++++++WT	+++++++WT	++++++++++++++WT	++++++++ +WT	
2.0 m							
2.1 m							
2.2 m							
2.3 m		bottom of TH ==========			bottom of TH		
2.4 m			bottom of TH ==========	==========	==========	bottom of TH ==========	
2.5 m							
2.6 m							
2.7 m							
2.8 m							
2.9 m							
3.0 m							

Likely T value: 10.00

Note: *Depth of percolation test holes should be indicated on log above. (Enter P or T at depts as appropriate).
** See Appendix E for BS 5930 classification.
*** 3 samples to be tested for each horizon and results should be entered above for each horizon.
**** All signs of mottling should be recorded.

3.2 **Trial Hole (contd.)** Evaluation:

there are 2 distinct layers in the trial hole. there was 400mm of water in trial hole after 48 hrs, there was no Rock at 2.4m deep. the lower section of trial hole was very compact. the soil appears to be free draining.
proceed to calculations

3.3(a) Percolation ("T") Test for Deep Subsoils and/or Water Table

Step 1: Test Hole Preparation

Percolation Test Hole	1	2	3
Depth from ground surface to top of hole (mm) (A)	600	600	600
Depth from ground surface to base of hole (mm) (B)	1,000	900	1,000
Depth of hole (mm) [B - A]	400	300	400
Dimensions of hole [length x breadth (mm)]	300 x 300	300 x 300	300 x 300

Step 2: Pre-Soaking Test Holes

Date and Time pre-soaking started	16/10/2020	10:00	16/10/2020	10:00	16/10/2020	10:00

Each hole should be pre-soaked twice before the test is carried out. Each hole should be empty before refilling.

Step 3: Measuring T_{100}

Percolation Test Hole No.	1	2	3
Date of test	17/10/2020	17/10/2020	17/10/2020
Time filled to 400 mm	10:00	10:00	10:00
Time water level at 300 mm	10:15	10:10	10:45
Time to drop 100 mm (T_{100})	15.00	10.00	45.00
Average T_{100}			23.33

If T_{100} > 300 minutes then T-value >90 – site unsuitable for discharge to ground
If $T_{100} \leq$ 210 minutes then go to Step 4;
If T_{100} > 210 minutes then go to Step 5;

Step 4: Standard Method (where $T_{100} \leq 210$ minutes)

Percolation Test Hole	1			2			3		
Fill no.	Start Time (at 300 mm)	Finish Time (at 200 mm)	Δt (min)	Start Time (at 300 mm)	Finish Time (at 200 mm)	Δt (min)	Start Time (at 300 mm)	Finish Time (at 200 mm)	Δt (min)
1	10:15	10:30	15.00	10:10	10:25	15.00	10:45	11:25	40.00
2	10:30	10:50	20.00	10:25	10:40	15.00	11:25	12:05	40.00
3	10:50	11:10	20.00	10:40	11:05	25.00	12:05	13:35	90.00
Average Δt Value			18.33			18.33			56.67
	Average Δt/4 = [Hole No.1]		4.58 (t_1)	Average Δt/4 = [Hole No.2]		4.58 (t_2)	Average Δt/4 = [Hole No.3]		14.17 (t_3)

Result of Test: T = 7.78 (min/25 mm)

Comments:

T value =7.78
this shows moderate percolation rate through subsoil

Step 5: Modified Method (where $T_{100} > 210$ minutes)

Percolation Test Hole No.	1				2				3			
Fall of water in hole (mm)	Time Factor = T_f	Time of fall (mins) = T_m	$K_{fs} = T_f / T_m$	T – Value = 4.45 / K_{fs}	Time Factor = T_f	Time of fall (mins) = T_m	$K_{fs} = T_f / T_m$	T – Value = 4.45 / K_{fs}	Time Factor = T_f	Time of fall (mins) = T_m	$K_{fs} = T_f / T_m$	T – Value = 4.45 / K_{fs}
300 - 250	8.1				8.1				8.1			
250 - 200	9.7				9.7				9.7			
200 - 150	11.9				11.9				11.9			
150 - 100	14.1				14.1				14.1			
Average T- Value	T- Value Hole 1= (t_1)			0.00	T- Value Hole 1= (t_2)			0.00	T- Value Hole 1= (t_3)			0.00

Result of Test: T = 0.00 (min/25 mm)

Comments:

3.3(b) Percolation ("P") Test for Shallow Soil / Subsoils and/or Water Table

Step 1: Test Hole Preparation

Percolation Test Hole	1	2	3
Depth from ground surface to top of hole (mm)	0	0	0
Depth from ground surface to base of hole (mm)	400	400.00	400
Depth of hole (mm)	400	400	400
Dimensions of hole [length x breadth (mm)]	300 x 300	300 x 300	300 x 300

Step 2: Pre-Soaking Test Holes

Date and Time pre-soaking started	16/10/2020	10:10	16/10/2020	10:10	16/10/2020	10:20

Each hole should be pre-soaked twice before the test is carried out. Each hole should be empty before refilling.

Step 3: Measuring P_{100}

Percolation Test Hole No.	1	2	3
Date of test	17/10/2020	17/10/2020	17/10/2020
Time filled to 400 mm	10:05	10:05	10:05
Time water level at 300 mm	10:15	10:20	10:25
Time to drop 100 mm (P_{100})	10.00	15.00	20.00
Average P_{100}			15.00

If P_{100} > 300 minutes then P-value >90 – site unsuitable for discharge to ground
If $P_{100} \leq 210$ minutes then go to Step 4;
If P_{100} > 210 minutes then go to Step 5;

Step 4: Standard Method (where $P_{100} \leq 210$ minutes)

Percolation Test Hole	1			2			3		
Fill no.	Start Time (at 300 mm)	Finish Time (at 200 mm)	Δp (min)	Start Time (at 300 mm)	Finish Time (at 200 mm)	Δp (min)	Start Time (at 300 mm)	Finish Time (at 200 mm)	Δp (min)
1	10:15	10:30	15.00	10:20	10:45	25.00	10:25	10:50	25.00
2	10:30	11:00	30.00	10:45	11:10	25.00	10:50	11:40	50.00
3	11:00	12:20	80.00	11:10	12:30	80.00	11:40	12:40	60.00
Average Δp Value			41.67			43.33			45.00
	Average Δp/4 = [Hole No.1]		10.42 (p_1)	Average Δp/4 = [Hole No.2]		10.83 (p_2)	Average Δp/4 = [Hole No.3]		11.25 (p_3)

Result of Test: P = 10.83 (min/25 mm)

Comments:

P value =10.83

Step 5: Modified Method (where $P_{100} > 210$ minutes)

Percolation Test Hole No.	1				2				3			
Fall of water in hole (mm)	Time Factor = T_f	Time of fall (mins) = T_m	$K_{fs} = T_f / T_m$	P – Value = 4.45 / K_{fs}	Time Factor = T_f	Time of fall (mins) = T_m	$K_{fs} = T_f / T_m$	P – Value = 4.45 / K_{fs}	Time Factor = T_f	Time of fall (mins) = T_m	$K_{fs} = T_f / T_m$	P – Value = 4.45 / K_{fs}
300 - 250	8.1				8.1				8.1			
250 - 200	9.7				9.7				9.7			
200 - 150	11.9				11.9				11.9			
150 - 100	14.1				14.1				14.1			
Average P- Value	P- Value Hole 1= (p_1)			0.00	P- Value Hole 1= (p_2)			0.00	P- Value Hole 1= (p_3)			0.00

Result of Test: P = 0.00 (min/25 mm)

Comments:

3.4 The following associated Maps, Drawings and Photographs should be appended to this site characterisation form.

1. Discovery Series 1:50,000 Map indicating overall drainage, groundwater flow direction and housing density in the area.
2. Supporting maps for vulnerability, aquifer classification, soil, bedrock.
3. North point should always be included.
4. (a) Sketch of site showing measurements to Trial Hole location and
   (b) Percolation Test Hole locations,
   (c) wells and
   (d) direction of groundwater flow (if known),
   (e) proposed house (incl. distances from boundaries)
   (f) adjacent houses,
   (g) watercourses,
   (h) significant sites
   (i) and other relevant features.
5. Cross sectional drawing of the site and the proposed layout[1] should be submitted.
6. Photographs of the trial hole, test holes and site (date and time referenced).

[1] The calculated percolation area or polishing filter area should be set out accurately on the site layout drawing in accordance with the code of practice's requirements.

4.0 CONCLUSION of SITE CHARACTERISATION

Integrate the information from the desk study and on-site assessment (i.e. visual assessment, trial hole and percolation tests) above and conclude the type of system(s) that is (are) appropriate. This information is also used to choose the optimum final disposal route of the treated wastewater.

Not Suitable for Development ☐

Suitable for [1]		**Discharge Route**
1. Septic tank system (septic tank and percolation area)	No	Discharge to Ground Water
2. Secondary Treatment System		
a. septic tank and filter system constructed on-site and polishing filter; or	Yes	
b. packaged wastewater treatment system and polishing filter	Yes	

5.0 RECOMMENDATION

Propose to install: Packaged wastewater treatment system and polishing filter

and discharge to: Ground Water

Trench Invert level (m): 23.50

Site Specific Conditions (e.g. special works, site improvement works testing etc.

we recommend a Tricel Novo IRL8 wastewater treatment plant which is designed to treat a maximum of 1200 litres of wastewater per day. This recommendation is based on the EPA Code of Practice which states the plant selection should be based on a hydraulic loading rate of 150l/per person/per day. The Novo IRL8 has a capacity of 4000 litres, of which 1900 are in the primary chamber, this ensures a long desludging interval. The Tricel Novo range of wastewater treatment plants is fully in conformance with EN12566-3 and complies with SR66.
For the soil polishing filter, a minimum of 42m of percolation pipe will be required. The EPA Code of Practice outlines a loading rate on the trench of 50 l/m2/d based on a P/T value of 3-20. It recommends that each percolation trench should be equal in length and no longer than 10m. The percolation pipe is laid in trenches 500mm wide. A Tricel distribution box will be required to split the flow evenly into each trench to ensure even dispersal.

there is moderate percolation area in the ground and treatment will occur .
The site of the infiltration system should be staked and roped off before any construction activities begin to make others aware of the site and to keep traffic and materials off the site.
Trenches should be backfilled as soon as possible after excavation.
Earth-moving machinery should not circulate over the infiltration area before or, more importantly, after pipework and backfilling of trenches has been completed. The area should be clearly marked for the duration of any subsequent site works.
Satisfactory performance of infiltration systems depends on maintaining soil porosity. Construction activities can significantly reduce the porosity and cause systems to hydraulically fail soon after being brought into service. Good construction practices should carefully consider site preparation (before and during construction) and equipment use.
Earthworks should ideally be carried out during periods of dry weather. Excavation activities can cause significant reduction in soil porosity and permeability.

[1] note: more than one option may be suitable for a site and this should be recorded

[2] A discharge of sewage effluent to “waters” (definition includes any or any part of any river, stream, lake, canal, reservoir, aquifer, pond, watercourse or other inland waters, whether natural or artificial) will require a licence under the Water Pollution Acts 1977-90. Refer to Section 2.6.2.

6.0 TREATMENT SYSTEM DETAILS

SYSTEM TYPE: Septic Tank System

Tank Capacity (m^3)	0.00	Percolation Area		Mounded Percolation Area	
		No. of Trenches	0.00	No. of Trenches	
		Length of Trenches (m)	0	Length of Trenches (m)	
		Invert Level (m)	0.00	Invert Level (m)	

SYSTEM TYPE: Secondary Treatment System

Filter Systems

Media Type	Area (m^2)*	Depth of Filter	Invert Level
Sand/Soil			
Soil			
Constructed Wetland			
Other			

Package Treatment Systems

Type	tricel Novo STP	
Capacity PE	8.00	
Sizing of Primary Compartment	1.90	m^3

SYSTEM TYPE: Tertiary Treatment System

Polishing Filter: Surface Area (m^2)*		**Package Treatment System:** Capacity (pe)	
or **Gravity Fed:**		**Constructed Wetland:** Surface Area (m^2)*	
No. of Trenches	6		
Length of Trenches (m)	7.00		
Invert Level (m)	23.50		

DISCHARGE ROUTE:

Groundwater	✔	Hydraulic Loading Rate * ($l/m^2.d$)	
Surface Water **		Discharge Rate (m^3/hr)	

TREATMENT STANDARDS:

Treatment System Performance Standard (mg/l)	BOD	SS	NH_4 - N	Total N	Total P
	20.00	30.00			

QUALITY ASSURANCE:

Installation & Commissioning	On-going Maintenance
SUPERVISION BY CHARTERED ENGINEER AT TIME OF INSTALLATION AND INSTALED BY EXPERIENCED CONTRACTOR.	SERVICED EVERY 12 MTHS and a maintenance agreement put in place with TRICEL

* Hydraulic loading rate is determined by the percolation rate of subsoil

** Water Pollution Act discharge licence required

7.0 SITE ASSESSOR DETAILS

Company: J O HARA CONSULTANT ENGINEERING.

Prefix: Mr. First Name: J Surname: O Hara

Address: Doocastle, Ballymote, Co Sligo

Qualifications/Experience: BEng, NCEA, Dip Eng, MIEI

Date of Report: 28/10/2020

Phone: 086 8123584 Fax: e-mail

Indemnity Insurance Number: F10049749C

Signature: _____