Comhairle Contae Fhine Gall
Fingal County Council

Broadmeadow Way Proposed Greenway
Between Malahide Demesne and
Newbridge Demesne

Volume 4A
EIAR Appendix 1

May 2019

fingal.ie

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1.0 Introduction

1.0.1 It is proposed to provide a new pedestrian and cycle (greenway) route linking Malahide Demesne and Newbridge Demesne via the railway causeway across the Malahide Estuary in Fingal.

1.0.2 An objective for the greenway is accreditation by the National Trails Office (NTO) as a recreational multi-access greenway which will become one of the National Trails of Ireland.

1.0.3 The scheme proposal is accompanied by an Environmental Impact Assessment Report (EIAR) and Natura Impact Study (NIS).

1.1 Objectives and Benefits

1.1.1 It is envisaged that the proposed scheme would be a flagship scheme for tourism in the area and be a model for recreational walking and cycling in Ireland. It will also exemplify how a sustainable trail can be built and integrated into a national cycle network, public transport, heritage sites, employment centres and local amenities.

1.1.2 The main objectives of this scheme are to:

- Provide an attractive first class pedestrian and cycle route (greenway).
- Encourage a larger modal shift (from private to public transport) and promote physical activity among local communities.
- Increase pedestrian activity in Malahide and Donabate villages.
- Provide access to mobility impaired users to scenic areas normally inaccessible to mobility impaired users.
- Improve access within the Malahide and Donabate area and the Malahide Estuary locality.
- Improve the co-operation between Malahide Castle and Newbridge Demesne in terms of accessibility, signage and advertisement for both demesnes.

1.1.3 The proposed greenway will allow the two demesnes to act together in promoting their individual attractions and also link the two public parks which will allow for future joint development of enhanced accessibility proposals.

1.2 Planning and Amenity Context

1.2.1 There is a clear planning policy context for the proposed cycle/walkway (Greenway) at national level to local level.

National Level

Climate Action and Low Carbon Development Act, 2015

1.2.2 The Act establishes the national objective of transitioning to a low carbon economy, climate resilient and environmentally sustainable economy. It includes the preparation

of five yearly National Low Carbon Transition and Mitigation Plans. Agriculture, transport, energy and the built environment are the main targets for mitigation effort. Local Authority climate change adaptation and mitigation strategies will also be required which, when completed, will form part of county development plans.

Our Sustainable Future – A Framework for Sustainable Development for Ireland

1.2.3 The Framework for Sustainable Development in Ireland, which was launched in June 2012, identifies some 70 measures to be implemented across Government and tasks a High-Level Inter-Departmental Group with ensuring that the vision set out in the policy document is translated into clear and effective action. One of the key areas of focus is transport. The 2015 Progress Report, charting the progress of the measures, noted that cycling in Dublin is increasing year on year with a near 50% increase in cycling journeys between 2012 and 2015 observed in the Dublin City Centre Cycle Count carried out by DCC in May each year.

National Planning Framework (NPF)

1.2.4 National Policy Objective 22 encourages cycle networks through the facilitation of the development of a National Greenways/Blueways Strategy which prioritises projects on the basis of achieving maximum impact and connectivity at national and regional level. The development of a greenway between Malahide Demesne and Newbridge Demesne Regional Parks will facilitate a wider network of greenways and provide access between rural and urban areas for both tourist related activities and commuting.

1.2.5 National Policy Objective 27 facilitates healthy communities through the provision of alternative means of transport to the car and states:

> "Ensure the integration of safe and convenient alternatives to the car into the design of our communities, by prioritising walking and cycling accessibility to both existing and proposed developments, and integrating physical activity facilities for all ages."

1.2.6 The NPF notes that countries with extensive cycle infrastructure report higher levels of cycling and lower rates of obesity. Healthy places in turn create economic value by appealing to a skilled workforce and innovative companies.

1.2.7 The NPF also indicates that Ireland's future homes will be located in places that can support sustainable development 'places which support growth, innovation and the efficient provision of infrastructure, are accessible to a range of local services, can encourage the use of public transport, walking and cycling, and help tackle climate change'. The contribution to a cleaner environment, including air quality, of cycling is recognised.

1.2.8 Cycling is recognised as part of smart growth, enhanced regional accessibility, sustainable mobility and an enhanced urban amenity which are all targeted national strategic outcomes of the NPF. Building centres of scale is intended to be achieved through Metropolitan Area Strategic Plans formulated through the new Regional Spatial and Economic Strategies. The NPF outlines high-level and long term strategic development issues for the MASPs areas including:

- physical development patterns and strategic growth areas.
- strategic infrastructure, particularly in the transportation and water services areas.

- large scale regeneration and the location of housing and employment.
- metropolitan scale amenities such as regional parks and walking and cycling networks.

1.2.9 It is intended that MASPs will align with and inform national-level sectoral investment plans to guide and coordinate investment within the metropolitan areas, coordinating land use planning and strategic infrastructure.

Sustainable Residential Development in Urban Areas (2009)

1.2.10 These section 28 guidelines outline the approach to be taken to sustainable residential development and prioritise walking, cycling and public transport, and the need to minimise the use of cars as a shared goal. The guidelines encourage developers to design in public transport, walking and cycling, making places more friendly to people movement rather than vehicle movement.

Smarter Travel – A Sustainable Transport Future: A New Transport Strategy for Ireland 2009-2020

1.2.11 In February 2009, the Smarter Travel Policy document for achieving a sustainable transport system for Ireland was published, this document outlines a number of policies to encourage a modal shift away from private car use and promoting public transport, walking and cycling.

National Cycle Policy Framework 2009-2020

1.2.12 In April 2009, Ireland's first National Cycle Policy Framework (NCPF) was issued; the vision of the policy is:

> "All cities, towns, villages and rural areas will be bicycle friendly. Cycling will be a normal way to get about, especially for short trips".

1.2.13 The aim of this framework is to encourage a culture of cycling to the extent that by 2020, some 10% of all trips will be completed by bicycle.

Strategy for the Development of Irish Cycle Tourism, 2007

1.2.14 Fáilte Ireland's document highlights the need for renewing the popularity of cycling in Ireland and how tourism generated through this sector can increase visitor spending in rural and urban areas. Guidance is also given on the types of roads suitable for a national cycle network along with the provision for facilities which support and encourage cycling as a mode. In the context of developing cycling infrastructure and to make Ireland a more attractive destination for cycling, key objectives include the provision of safe and attractive cycling routes with associated services and facilities.

Irish Trails Strategy

1.2.15 The Irish Trails Strategy was launched in January 2007 and aims to develop a world class recreational trail system in Ireland for all Irish citizens and visitors to the country to enjoy. This strategy lead to the establishment of a National Trails Advisory Committee (NTAC) and the setting up of a National Trails Office within the Irish Sports Council. The NTO have published a number of publications setting out the requirements and standards for trail development in Ireland. Relevant documents include, A' Guide to

Planning and Developing Recreational Trails in Ireland', 'Classification and Grading for Recreational Trails' and 'Management Standards for Recreational Trails'. The NTO website includes a register of a wide range of trails on offer throughout the country from strategic to local level trails. Trails which fully meet NTO standards are NTO accredited trials.

Regional Policy

Regional Spatial and Economic Strategy (RSES) & Metropolitan Area Strategic Plan (MASP)

1.2.16 The RPGs are due to be replaced by the new Regional Spatial and Economic Strategies for the regions during 2019. At the time of writing, the Eastern & Midland Regional Assembly RSES was at public display of material amendments stage. The new regional plan for the region which will set out a long term strategic planning and investment strategy for the Dublin area and surrounding counties and Midlands area to 2031 and beyond. Included in this draft RSES is a 12 year horizon Metropolitan Area Strategic Plan (MASP) for Dublin, which will give greater analysis and detail of how the overall objectives and policies of the NPF and RSES will be implemented. The MASP identifies key strategic residential and employment development corridors, large scale regeneration areas, linked to quality public transport with key services infrastructure investment required to support growth and key investments in amenity and community resources, to create sustainable compact communities.

1.2.17 Section 5.6 of the MASP identifies cycling and walking as a key element in promoting and creating healthier places, mitigating climate change and facilitating tourism and metropolitan scaled amenities such as strategic cycling networks having regard to the NTA Greater Dublin Area Cycle Network Plan. Specifically, the MASP promotes the development of a Metropolitan Greenway Network, a strategic network of connected greenways for cycling and walking to enable access to key environmental assets within the Metropolitan area, including coastal areas, while having regard to the environmental sensitivities of the area.

Regional Planning Guidelines for the Greater Dublin Area 2010-2022 (due to be replaced)

1.2.18 This document provides the development strategy for the Dublin and Mid-East regions over the plan period. It emphasises the role of the capital city in future economic growth of the region and the need to ensure it is an attractive, vibrant location for industry, commerce, recreation and tourism. Development in the GDA (Greater Dublin Area) shall be directly related to investment in high quality public transport and focused on achieving a compact urban form.

1.2.19 The strategy considers that a minimum of 10% of all trips should be by bicycle by 2020. It emphasises the integration of cycle routes and infrastructure into new development and communities as key component of the delivery of greener transport travel patterns. Programmes to support this objective and create a culture of cycling should be pursued as well as promoting the tourism benefits of improved cycle networks within the GDA.

1.2.20 Specifically, the RPGs fully supports the development of coastal paths along the east coast of the GDA. Section 7 'Green Infrastructure, Heritage and Environment' seeks to:

- Increase opportunities and ease of access to countryside and areas of interest for residents, wildlife and biodiversity, with focus on promoting river corridors, Natura sites, nature preserves and other distinctive landscapes and regionally important green spaces as focal features for linkages between natural, semi -natural and formalised green spaces.

- Development of targeted walkways and cycleways, integrated as part of opportunities for other projects such as river restoration, biodiversity enhancement as part of process of strengthening connectivity between green spaces and strategic linkages between urban settlements and countryside.

- Promote and facilitate the development of coastal paths along the east coast of the GDA, joining up with existing recreational paths, creating new linkages between and extensions to existing facilities where feasible. Development Plans should include a goal to facilitate the development over time of a coastal path for the entire GDA which would include a habitat impact assessment and the need to avoid negative impacts on Natura 2000 sites, and careful route selection, linking and expanding into adjoining Regional Authority areas and integrated into future coastal zone management plans for the area.

- Encourage development of green bridges over existing physical transport barriers and require their inclusion in future infrastructure investments. Retrofitting projects should be phased and prioritised to repair fragmentation caused by grey infrastructure.

1.2.21 These objectives and particularly the latter are of particular relevance to the development of the proposed greenway along this stretch of coastal corridor where the majority of the route is aligned with the Dublin-Belfast railway line.

Transport Strategy for the Greater Dublin Area, 2016-2035

1.2.22 This document was published by the National Transport Authority in 2016 with its purpose being:

> "...to contribute to the economic, social and cultural progress of the Greater Dublin Area by providing for the efficient, effective and sustainable movement of people and goods."

1.2.23 The plan provides the transport strategy for the Greater Dublin area to 2035. It highlights the need to integrate land use and transport planning in achieving a consolidated urban area supported by non-private vehicle movement. The environment for pedestrians and cyclists needs to be improved to encourage a much greater proportion of trips to be made on foot, by bicycle or public transport. Dublin is to become a recognised walking and cycling city-region with a street environment that is attractive, safe and pedestrian/cyclist orientated in design.

Greater Dublin Area Cycle Network Plan

1.2.24 The Greater Dublin Area Cycle Network Plan was published by the NTA in 2013 and sets out the proposed cycle network in the Greater Dublin Area. The proposed route is identified as a greenway route FG1 and a strategic route intercounty N5-Future East Coast Trail. This results in the proposed route needing to cater for both commuter and

leisure users with a design that can accommodate both in a satisfactory manner. The NTA Cycle Manual 2011 set outs the required standards for cycleway facilities.

Fingal County Development Plan 2017-2023

1.2.25 A coastal walk is a long standing objective of Fingal County Council. The County Development Plans 2011-2017 and 2017-2023 fully support the development of a greenway between Malahide and Donabate called the Broadmeadow Way.

Map Objective 39

1.2.26 Seek the provision of a public walkway/cycleway on land west side of the train line in Donabate and along the existing embankment across the Malahide Estuary, in consultation with Iarnród Éireann within the lifespan of the Development Plan.

Map Objective 43

1.2.27 Completion of the Broadmeadow Way between Malahide and Donabate to be prioritised during the lifetime of the Development Plan.

Objective MT13

1.2.28 Promote walking and cycling as efficient, healthy, and environmentally-friendly modes of transport by securing the development of a network of direct, comfortable, convenient and safe cycle routes and footpaths, particularly in urban areas.

Objective MT14

1.2.29 The Council will work in co-operation with the NTA and adjoining Local Authorities to implement the *Greater Dublin Area Cycle Network Plan* subject to detailed engineering design and the mitigation measures presented in the SEA and Natura Impact Statement accompanying the NTA Plan.

Objective GI28

1.2.30 Provide attractive and safe routes linking key green space sites, parks and open spaces and other foci such as cultural sites and heritage assets as an integral part of new green infrastructure provision, where appropriate and feasible.

1.3 Constraints Study

1.3.1 The purpose of the Constraints Report is to establish all issues of an environmental nature which may affect the proposed greenway (cycle/pathway) so that possible/feasible route options can be identified.

1.3.2 This report has been compiled based on desk studies, site survey work and consultation with stakeholders.

1.4 Study Area

1.4.1 Taking into account the general requirement to connect the demesnes of Malahide and Newbridge by way of a link across the railway causeway at Malahide a study area of approximately 12km^2 has been adopted (see Appendix J-Figure 1). The study zone incorporates Malahide Castle within Malahide Demesne, and Newbridge House within Newbridge Demesne as the terminal points of the development. The environmental elements considered here include Landscape, Population and Human Health, Architectural Heritage, Archaeology and Cultural Heritage, Land, Soils and Groundwater, Surface Water, Material Assets – Agronomy, Biodiversity, Air Quality and Climate, and Noise and Vibration. This Constraints Report will form the basis for the environmental assessment of potential route options for the proposed scheme.

2.0 Key Objectives and Engineering Constraints

2.0.1 This chapter identifies the key objectives and engineering constraints with the study area including key stakeholders and their requirements. The requirements of the proposed scheme are to deliver a safe, high quality greenway between Malahide Demesne and Newbridge Demesne via the railway causeway across the Malahide Estuary.

2.0.2 The proposed route of the greenway must take account of Fingal County Council's current Development Plan, Local Area Plans and the Malahide Public Realm Strategy.

2.0.3 The proposed greenway must comply with the National Transport Authority (NTA) requirements including the requirements of the National Cycle Manual. Routes as detailed in the Draft Greater Dublin Area Cycle Network Plan are also considered.

2.0.4 The greenway is to be accredited by the National Trails Office (NTO) as a recreational multi-access trail which will be included on the NTO trails website and will become one of the national trails of Ireland. Therefore the greenway must comply with the NTO requirements.

2.0.5 The proposal must take account of the requirements of the National Parks and Wildlife Service (NPWS) in that it provides an access track across the Malahide Estuary and the design has to minimise the effect on wildlife present in the estuary and allow for the needs designated in the Special Areas of Conservation (SAC), Special Protection Areas (SPA), proposed Natural Heritage Areas (pNHA) and Natura 2000 sites and yet still provide a safe and usable greenway.

2.0.6 The proposed greenway runs along the causeway across Malahide Estuary which is owned by Irish Rail. Irish Rail must be consulted throughout all stages of the project and their requirements are to be complied with.

2.0.7 The requirements and recommendations of the Fingal East Meath Flood Risk Assessment and Management Study (FEM-FRAMS) must be reviewed and any potential flood risk must be fully assessed.

2.0.8 The greenway must comply with all current design and detailing standards including current standards and legislation to provide a safe and code compliant project.

2.0.9 The requirements of local stakeholders have to be taken into account as part of the design process.

2.1 National Transport Authority Requirements

2.1.1 The National Transport Authority has published the National Cycle Manual which gives guidance in relation to the provision of safe traffic environments for all road users including cyclists and pedestrians. The requirements in relation to the proposed greenway are detailed below.

2.1.2 In accordance with 'Section 1.9.3 – Shared Facilities' of the National Cycle Manual the following considerations will help both cyclists and pedestrians to be aware of the other's presence:

- Pedestrian should always have priority, reinforced by signage.
- Cyclists should consider themselves as 'cycling on the footpath'.
- Segregate pedestrians and cyclists vertically and/or horizontally.

- Delineation markings should not be used as they give cyclists an incorrect sense of a dedicated cycle space.
- Sufficient width of footpath and cycle track will help both modes to travel in comfort.
- Sufficient width to facilitate evasive action and/or avoidance of potential conflict.
- Shared facilities next to vehicular traffic should have a minimum combined width of 3.0m.
- Greenway to be lit to sufficient standard to allow it to be used by commuters and tourists late in the evening.
- Cycling alignment and speed reduction measures should be considered.

Shared Crossings

2.1.3 Toucan crossings allow pedestrians and cyclists to cross together without the need for the cyclist to dismount. They are recommended for crossing district distributors and other main roads. The approaches to the crossing should be designed so as to minimise conflicts between cyclists and pedestrians.

Greenway Width Requirements

2.1.4 In accordance with the NTA National Cycle Manual the width of the greenway can be determined using the width calculator.

2.1.5 There are three basic elements that determine the width of a cycle lane or track:

- The space to the left of the cyclists.
- The space required to support the cycling regime.
- The space to the right of the cyclists.

2.1.6 The method of width calculations is outlined in Section 7.2 of the Cycle Manual, and will be used to assess the greenway width for this project.

2.2 National Trails Office Requirements

2.2.1 The National Trails Office has published guidance in relation to planning and developing recreational trails in Ireland, in particular the following publications:

- A Guide to Planning and Developing Recreational Trails in Ireland (February 2012).
- Management Standards for Recreational Trails (October 2008).
- Classification and Grading for Recreational Trails (2008).

2.2.2 It is proposed that the greenway will be fully accredited by the National Trails Office and will be included on the National Trails Register, therefore it must comply with the requirements of the National Trails Office.

2.2.3 The NTO's trail classification system provides a means of classifying trails based on the nature of the trail and the class is assigned based primarily on the key physical attributes of the trail as follows:

- The gradient on the trail.
- The width of the trail.
- The nature of the trail surface.

Overall Objectives and Users of the Proposed Greenway

2.2.4 It is proposed that the greenway will be a linear walking and cycling greenway which will link Malahide Demesne and Newbridge Demesne which will be accessible by all users including people with reduced mobility, wheelchair users, people with vision impairment, using crutches, with a buggy, with small children, older people, etc.

2.2.5 The greenway will be aimed at local casual walkers and cyclists, enthusiasts from outside the area and international visitors.

2.2.6 To meet the above objectives the proposed greenway must comply with the requirements of a Class 1 Walking Trail (including the requirements of Appendix 2) and a Class 1 Cycling Trail of the NTO Classification and Grading for Recreational Trails publication.

2.2.7 As the proposed greenway is a shared use trail, it must meet the NTO grading, width and surface requirements for both walking and cycle routes and the requirements under Shared Use Trails/Greenways as detailed below.

2.2.8 The greenway should be off-road to improve safety and experience of all users.

Trail Grading Requirements for Multi Access

- *Walking Trail Grading Requirements*: The proposed route must provide a gradient of flat to 5% (up to 8% allowed for ramps where required). Steeper gradients will not meet with the NTO Class 1 requirements.
- *Off-road Cycleway Grading Requirements*: The proposed route must provide a gradient of flat to 5%. Class 1 trails are suited to all abilities of users and bikes, including families with small children and their bikes.
- *Shared Use Trails/Greenways Grading Requirements*: The proposed route must provide a gradient of 5% maximum.

Trail Width Requirements for Multi Access

- *Walking Trail Width Requirements*: Range: 1.8m to 3.0m.
- *Off-road Cycleway Width Requirements*: Range: 2.2m to 3.0m.
- *Shared Use Trails/Greenways Width Requirements*: Range: 2.0m to 3.0m.

Trail Surface Requirements for Multi Access

- *Walking Trail Surface Requirements*: Sealed non-slip surfaces, non-slip timber boardwalk, tarmac or compacted surface with no loose stone or gravel greater than 5mm.
- *Off-road Cycleway Surface Requirements*: Consistent sealed surfaces, or compacted material. Minimal loose material no larger than 6mm.
- *Shared Use Trails/Greenways Surface Requirements*: Consistent sealed surfaces, or compacted material. Minimal loose material no larger than 20mm. May have dual surface – hard sealed surface for bikes and parallel softer compacted surface for walkers.

2.2.9 There are also additional requirements contained in Appendix 2 of the NTO Classification and Grading for Recreational Trails publication as detailed below.

Appendix 2: Multi-Access Trail Requirements

1. *Parking*: The greenway must have a vehicle parking area that includes at least one disabled parking bay for every 25 spaces. The parking bay dimensions must be 4800mm by 2400mm. If adjacent disabled parking bays are provided add 900mm between parking bays for optimum access. Steps should be taken to ensure that disabled parking facilities are not abused.

   The route from the disabled parking bays to the start of the greenway should be clear and level, with no high kerbs or other obstructions.

2. *Trail Surface*: The greenway must have a smooth, non-slip, hard, all weather surface free from protruding stones, roots or other potential trip hazards. Some loose stones smaller than 5mm are acceptable.

3. *Trail Surface Width*: Range: 1,800mm to 3,000mm.

4. *Corridor Width*: Vegetation must be cleared back at least to the width of the greenway surface and to a minimum of 2100mm above the greenway. No vegetation should encroach or protrude onto the greenway.

5. *Slopes or Ramps*: Gradient – Desirable: 1:20 (5%) and maximum 1:12 (8%).
   Width – Desirable: up to 1,200mm and minimum: 1,000mm.
   Turning width at top or bottom of ramp – Desirable: up to 1,700mm and minimum: 1,500mm.

   If gradient is greater than 1:20 (5%) a level landing (resting place) 1700m long must be provided. The maximum acceptable height rise between landings is 950mm. Multiple landings must be provided if necessary to maintain this requirement. A maximum distance of no more than 9m between resting areas is recommended.

   If gradient is greater than 1:20 (5%) handrails must be provided on ramps/slopes. Where handrails are provided, the top rail must be 90cm from the ground, to facilitate a person walking and the lower rail situated for persons in wheelchairs and for children at 75cm from the ground. The surface of handrails must be smooth so persons do not scrape their hands (e.g. no projecting bolts or nail heads).

6. *Cross Slope on Trail*: Maximum 1:45 (2%).

2.2.10 The proposed greenway must comply with the above requirements.

2.3 Protected Sites and National Parks & Wildlife Service Requirements

2.3.1 The Malahide Estuary is a designated Special Area of Conservation (SAC) and Special Protection Area (SPA) and details of these designations are summarised below.

2.3.2 The estuary is also designated as a proposed Natural Heritage Area (pNHA) and is also listed under the RAMSAR Convention.

Special Area of Conservation (SAC)

2.3.3 The Malahide Estuary is designated as a Special Area of Conservation (SAC) and features of interest include:

- Mudflats and sandflats not covered by seawater at low tide [1140].
- Salicornia and other annuals colonising mud and sand [1310].
- *Spartina* swards (*Spartinion maritimae*) [1320].
- 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.]

2.3.4 The extent of the Malahide Estuary Special Area of Conservation is shown on Text Figure 2.1 below.

Special Protection Areas (SPA)

2.3.5 The Malahide Estuary is designated as a Special Protection Area and features of interest include:

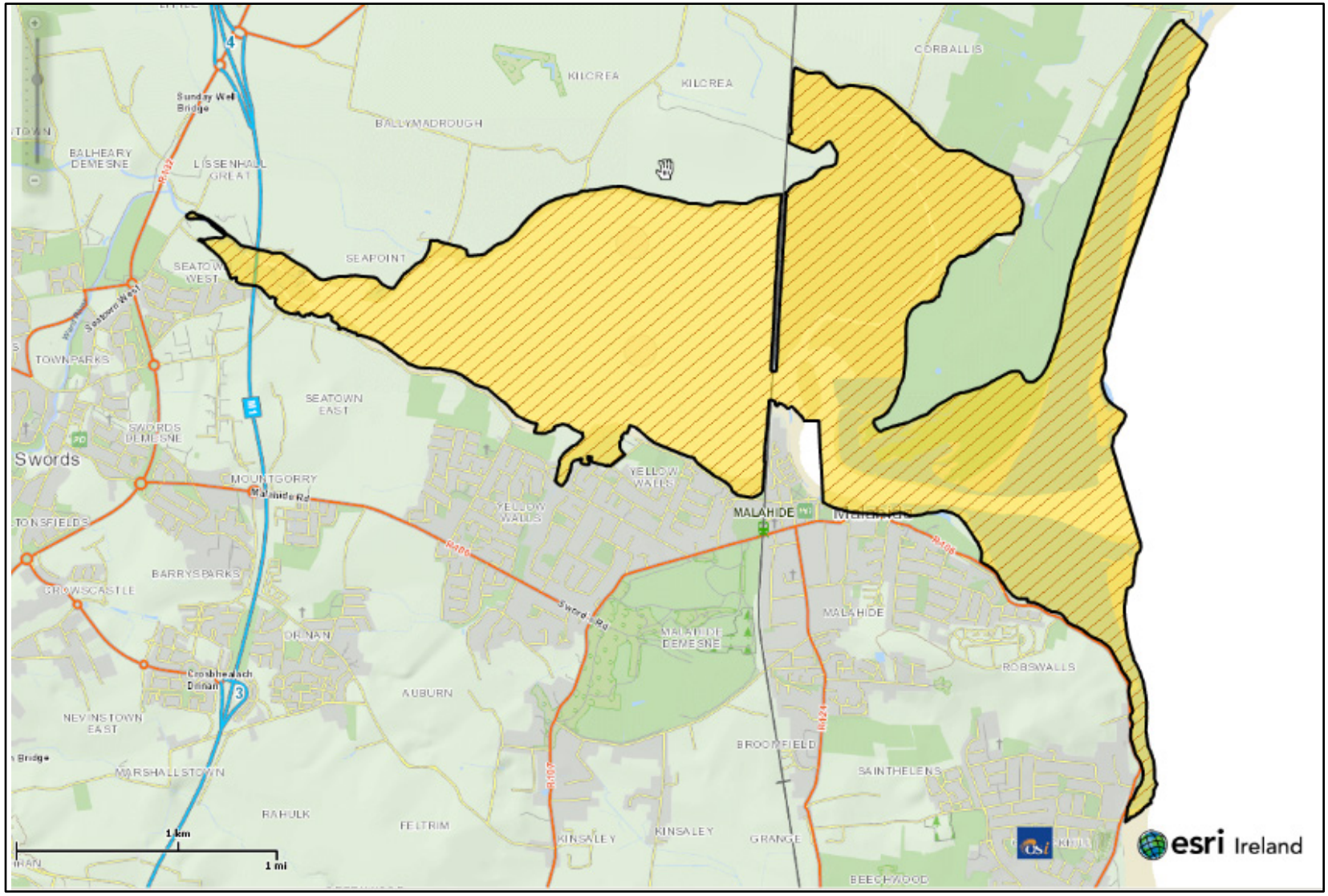
- Great Crested Grebe (*Podiceps cristatus*) [A005].
- Brent Goose (*Branta bernicla hrot*a) [A046].
- Shelduck (*Tadorna tadorna*) [A048].
- Pintail (*Anas acuta*) [A054].
- Goldeneye (*Bucephala clangula*) [A067].
- Red-breasted Merganser (*Mergus serrator*) [A069].
- Oystercatcher (*Haematopus ostralegus*) [A130].
- Golden Plover (*Pluvialis apricaria*) [A140].
- Grey Plover (*Pluvialis squatarola*) [A141].
- Knot (*Calidris canutus*) [A143].
- Dunlin (*Calidris alpina alpina*) [A149].
- Black-tailed Godwit (*Limosa limosa*) [A156].
- Bar-tailed Godwit (*Limosa lapponica*) [A157].
- Redshank (*Tringa totanus*) [A162].
- Wetlands [A999].

2.3.6 The extent of the Malahide Estuary Special Protection Area is shown on Text Figure 2.2 below.

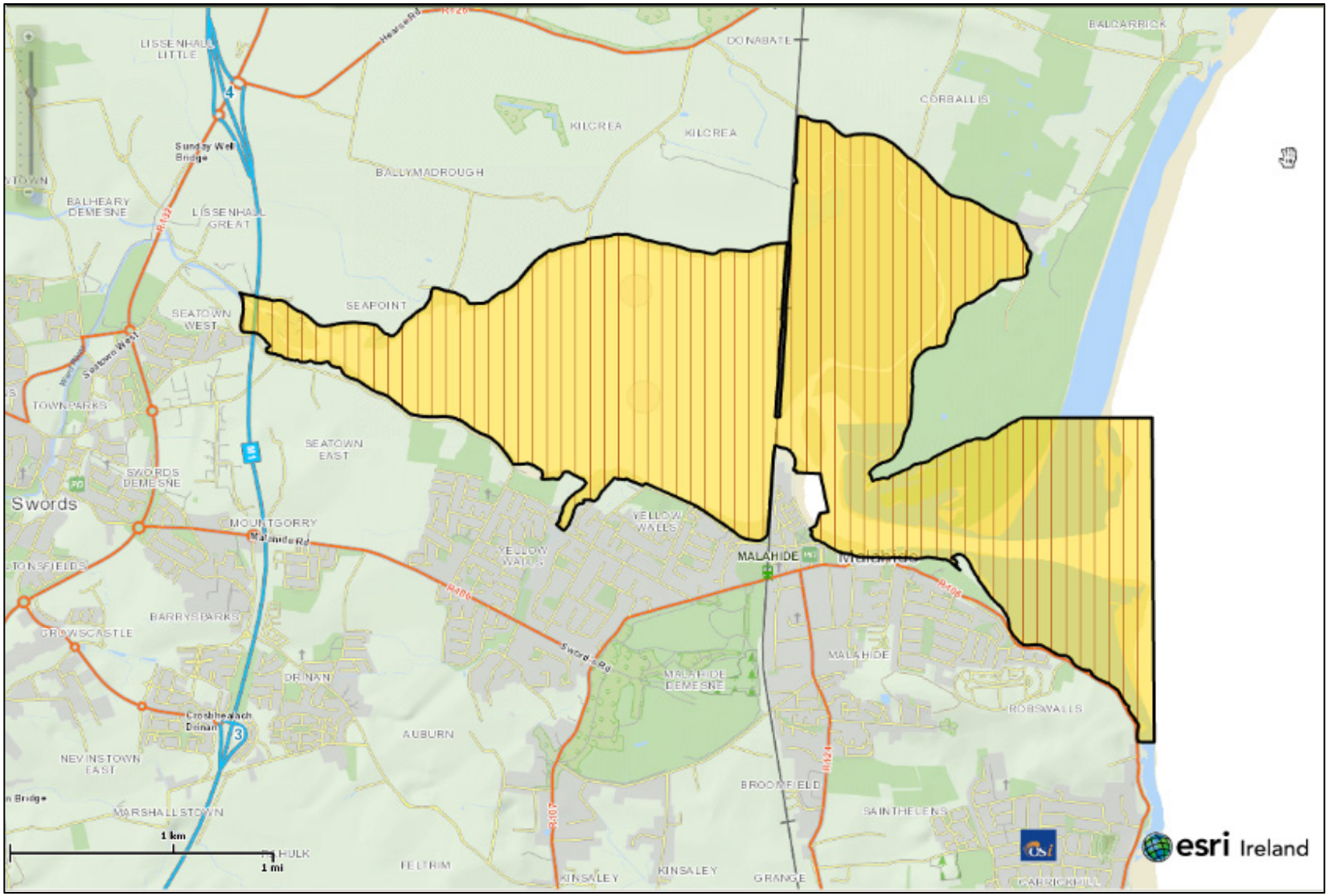
Proposed Natural Heritage Areas (pNHA)

2.3.7 Proposed Natural Heritage Areas are areas that are important for wildlife conservation. Some of these sites are small, such as roosting areas for rare bats; others can be large, such as a blanket bog or a sand dune system.

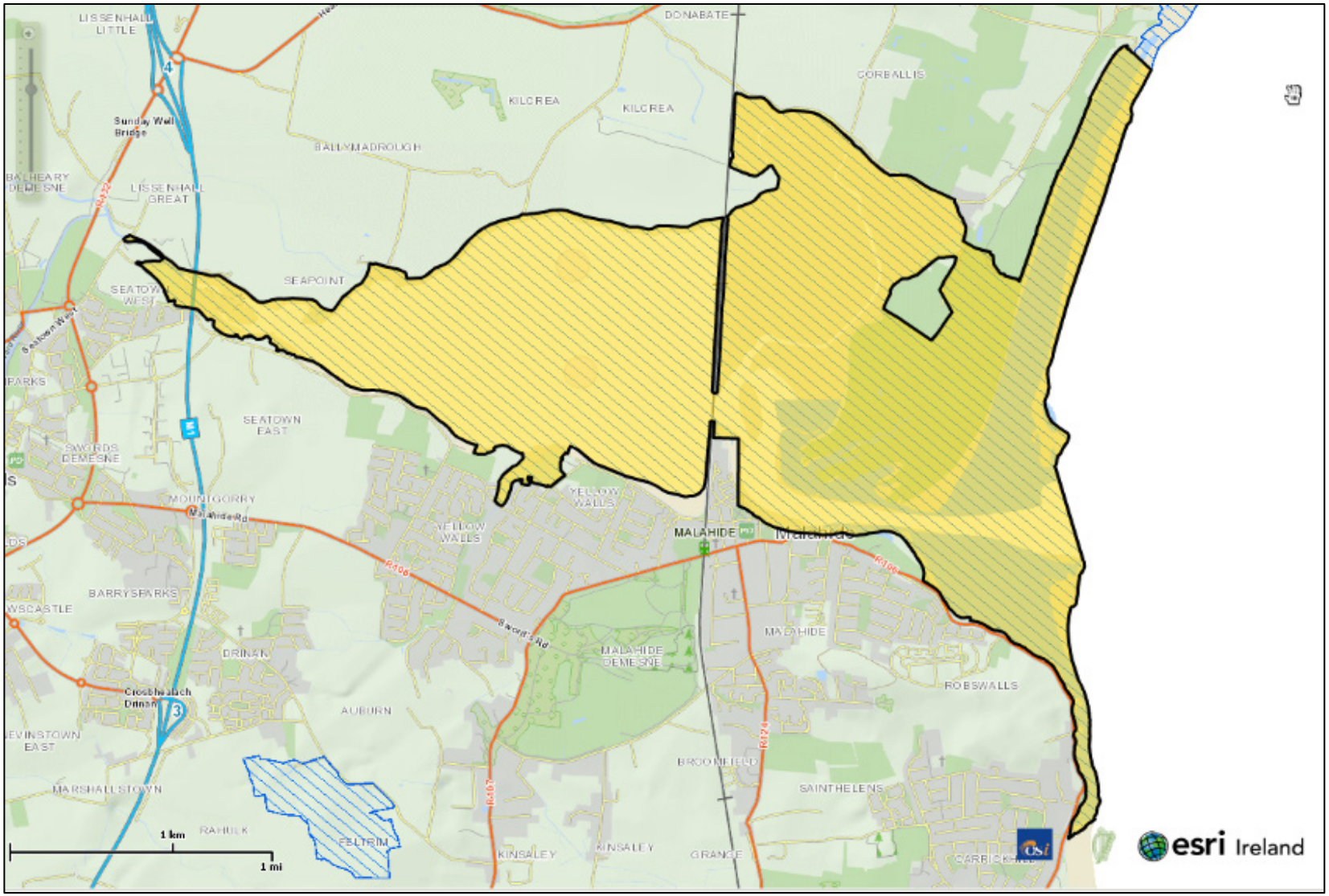
2.3.8 The extent of the Malahide Estuary proposed Natural Heritage Area is shown on Text Figure 2.3 below.



Text Figure 2.1 Screen grab of extent of SAC from NPWS website.



Text Figure 2.2 Screen grab of extent of SPA from NPWS website.



Text Figure 2.3 Screen grab of extent of pNHA from NPWS website.

Ramsar Convention

2.3.9 Broadmeadow Estuary. 11/06/96; 546 ha; 53º227'N 006º10'W. An estuary cut off from the sea by a large sand spit. The site includes well-developed saltmarshes, salt meadows, rocky shores, a well-developed outer dune ridge and sand mudflats exposed at low tide. Vegetation consists of a large bed of eelgrass (*Zostera noltii* and *Z. angustifolium*) and extensive mats of green algae (*Enteromorpha* spp., *Ulva lactuca)*. The estuary is an important wintering site for numerous species of waterbirds. The Brent Goose population is of international importance. The high number of diving birds reflects the lagoon-type nature of the inner estuary. Human activities include water sports. There is a marina and some housing. Ramsar site no. 833. Most recent RIS information: 1995.

NPWS Requirements

2.3.10 A section of the proposed greenway utilises the Irish Rail causeway and viaduct which traverses Malahide Estuary.

2.3.11 Under Articles 6(3) and 6(4) of the Habitats Directive the project is subject to the requirements of Appropriate Assessment. A Natura Impact Study (NIS) will need to be prepared. The NIS will consider the ecological effects of the proposed greenway.

2.3.12 The environmental constraints are detailed in Chapters 3.0 to 12.0 and should be referenced in conjunction with this chapter.

2.4 Irish Rail Requirements

2.4.1 The proposed route of the greenway along the causeway to the south of the Irish Rail viaduct is at a lower level than the railway tracks and is currently used as an access track by Irish Rail for the maintenance of the viaduct and weirs.

2.4.2 A new pedestrian and cycle bridge is to be constructed running parallel to the existing Irish Rail viaduct. The design of this bridge will include for access for emergency and maintenance access vehicles.

2.4.3 The proposed route of the greenway along the causeway to the north of the viaduct is at a higher level adjacent to the railway tracks.

2.4.4 It is a requirement of Irish Rail that the fabric of the causeway is not disturbed by the construction of the greenway or associated screening.

2.4.5 Irish Rail have also confirmed that, prior to any works commencing on the causeway, for safety reasons, they would construct a 2.4m high fence to segregate the works area from the railway tracks.

2.5 Local Stakeholders

2.5.1 As part of the project all stakeholders are to be identified and consulted and their comments and opinions are to be taken into account as part of the design of this project.

2.6 FEM-FRAMS Requirements

2.6.1 Fingal County Council (FCC) along with project partners Meath County Council and the Office of Public Works (OPW) have carried out the Fingal East Meath Flood Risk Assessment and Management Study (FEM-FRAMS). This is a catchment-based flood risk assessment and management study of nineteen rivers and streams and their catchments, including the Broad Meadow River, the Ward River and their tributaries.

2.6.2 Draft Flood Risk Management Plans (FRMP) were produced as part of this report which define the levels of existing and future flood risk in the Fingal-East Meath Area.

2.6.3 It is a requirement that the proposed project is reviewed in detail from a flooding perspective and to identify any potential flood risks and measures that can be incorporated in the design to mitigate this risk.

3.0 Landscape

3.1 Introduction

3.1.1 This chapter identifies the landscape and visual constraints in the study area for the proposed development.

3.2 Methodology

3.2.1 The methodology used makes reference to the methodologies provided in the current Transport Infrastructure Ireland (TII) (formerly the National Roads Authority (NRA)) Environmental Assessment Guidelines, the EPA document *Draft Guidelines on the information to be contained in Environmental Impact Assessment Reports (EIAR)* (2017), supplemented by the document produced by the Landscape Institute and Institute of Environmental Assessment, *Guidelines for Landscape and Visual Impact Assessment, Third Edition* (2013) and the guidelines contained in Volume 11, section 3, part 5, of the *UK Design Manual for Road and Bridges* (1992) (also various amendments, including quarterly updates).

3.2.2 The methodology provides for an analysis of the landscape character, landscape features, landscape designations and the location of visual receptors within the study area, identifying determining elements and sensitive aspects.

Identification of Landscape Character

3.2.3 Landscape character is determined by the interaction of elements in the landscape that combine to give an area its particular identity. Important elements are physical factors, such as topography, vegetation, drainage, etc; human factors, such as settlements, landuse, cultural and historical associations, etc; and aesthetic factors such as aspect and visibility.

Identification of Sensitive Landscape and Visual Receptors

3.2.4 Sensitive receptor refers to a physical or natural landscape resource, special interest or viewer location. The following landscape receptors are identified under the general headings of "Natural Features", Built Form" and "Landscape Planning".

- Landscape Elements: The particular elements or combination of landscape elements which may be impacted by development and an assessment of the significance of such elements in terms of their representativeness or rarity in the context of the study area.
- Land Use: Amenity, recreational or other landscape or visual related land uses are noted.
- Open Landscapes: A landscape which by the nature of its aspect, elevation or lack of vegetation, is considered visually open, is likely to facilitate extensive and expansive viewing.
- Valued Landscapes: Areas within the study area that have received specific designations for their landscape quality or character, including designations made at national, county and local level, etc.

- Viewers: Viewers of the landscape have been identified in terms of specific density or prominence of residential properties, tourist routes, designated walks, etc.

- Cultural Landscapes: A landscape, the form and appearance of which, has been noticeably influenced by man or a feature of cultural significance such as a holy well, high cross etc. However, these are covered in detail in Chapter 6.0 of this Constraints Report.

3.3 Existing Environment

Introduction

3.3.1 The Fingal coastline extends from north of Dublin in the south to the Meath border in the north. It contains a number of important beaches, islands and headlands, which together create a sensitive and nationally important landscape of high amenity and landscape value. The land is generally low lying, except for some prominent headlands and hills to the north of area. Views along the coast are generally contained within these headlands, ridgelines and harbours, which combine to create spectacular viewing points.

3.3.2 Immediately inland from the coastal strip are three heritage houses and demesnes; Ardgillan Demesne, Newbridge Demesne and Malahide Demesne. This study is concerned with the connection of the Malahide to Newbridge Demesnes.

3.3.3 From its early beginnings as an agricultural, maritime and industrial centre, Malahide has developed into a modern, progressive town. While retaining its 'village' atmosphere in the centre of the town, Malahide has become a popular and desirable residential area on the outskirts of Dublin.

3.3.4 The coastal location has also helped the development of tourism in the town. Malahide has a popular marina with some three hundred berths and the only natural inlet along the east coast. As a result Malahide is a popular destination for visiting yachts from both Ireland and overseas.

3.3.5 The estuary is divided east/west by the rail viaduct, with the outer, eastern area fully tidal containing the marina. The inner estuary displays a restricted tidal range as a result of a weir placed at the midpoint of the railway viaduct. The creation of the inner estuary basin is attractive to both wildfowl and yacht owners, with a number of boat clubs around the estuary and a highly protected ecology.

3.3.6 The attraction of the coastal zone and proximity to substantial conurbations, has led to the development of numerous walks and cycleways. Much of this coastal walkway and cycle route is already in place; however, a significant diversion currently has to be taken around the Malahide Estuary into Donabate, which could be resolved through the creation of a direct route across the estuary between the Malahide and Newbridge Demesnes, sharing the railway causeway.

3.3.7 Once complete, the route under consideration in this study would not only form a valuable new link in the chain of the long distance trail, but would, with imaginative routing and links to public transport, also create an important local recreational focus and educational amenity.

The Immediate Context of the Study Corridor

3.3.8 The proposed route runs through a variety of landscape types within the study area. For the ease and clarity of reporting and assessing, the study area has been divided into areas of common landscape character. These are:

- Section 1 – Malahide Demesne.
- Sections 2 & 3 – Malahide Road and Village.
- Section 4 – Railway Causeway.
- Section 5 – Kilcrea Townland.
- Section 6 – Newbridge Demesne.

Section 1 – Malahide Demesne

3.3.9 The Malahide demesne has a history extending back to the 12th century, but what is apparent now is a mature landscape, with a readily recognisable 18th century designed parkland structure of open lawns, meadows and glades framed by woodland, tree belts and punctuated with groups and stands of trees. The castle, parkland and gardens extend to 109ha and were acquired by Dublin City Council in 1976 from the Talbot family, who had owned the castle and grounds since 1185. The demesne is now fully open to the public and forms an important amenity resource for the town and region, with numerous formal and informal recreational facilities contained within the park including cricket and football pitches, tennis courts, golf, and pitch and putt.

3.3.10 The last Lord Talbot was a renowned botanist and plantsman, creating what is now the Talbot Botanic Gardens within the heart of the demesne. This represented one of the finest private 20th century plant collections in Ireland and has now been fully restored by Fingal County Council as a principal feature of the park.

3.3.11 A complex of stable and demesne workers' buildings set around a stable courtyard has been converted and extended into a modern expansive visitor centre, with shops, restaurant and interpretation. The complex, adjacent to the historic castle and at the heart of the demesne, also provides access into the walled garden to the east. A large car and coach park has also been created to the south of the visitor centre and the east of the main access.

3.3.12 The main areas of woodland and formal gardens extend to the east and west of the castle to connect to the perimeter woodland belts. This divides the demesne in two, creating large open expanses to the north and south. The formal recreation areas are predominantly in the north, towards the town, and are serviced by a separate car parking facility at Bridgefield in the northeast corner of the demesne.

3.3.13 The nature of the 18th century idealised concept of the romantic English Landscape style evident at Malahide, containing and controlling views and screening the demesne off from the outside world, creates an insular landscape remote from the effects of the surrounding environment.

Sections 2 & 3 – Malahide Road and Village

3.3.14 The demesne is immediately adjacent to the town centre and residential areas, representing an immediate amenity for the local community and visitors to the town. The character of this section, once outside the demesne, is urban/suburban.

3.3.15 North of the Malahide demesne, the land falls away towards the estuary. The R106 running into town borders the demesne to the north and the railway runs to the eastern boundary, with the station immediately north of the R106. As the land falls towards the estuary, the railway leaves Malahide Station on low embankment and forms the western edge of a promontory of land pointing northwards into the estuary. East of the railway the main town centre extends along this promontory, with three- and four-storey residential properties overlooking the marina. These residential units also look westward over the railway and the eastern inner estuary. Housing continues around the southern shore of the inner estuary along Bissets Strand. These properties are predominantly bungalows with long views northwards over the estuary towards Kilcrea.

3.3.16 It is important to note that the railway acts as a strong physical and visual barrier and divide between the town centre to the east and suburban residential areas to the west.

Section 4 – Railway Causeway

3.3.17 Midway on the railway causeway a weir has been created to permit the movement of water between the two parts of the estuary. The weir restricts the fall of water at low tide retaining a significant body of water within the inner estuary. At low tide, therefore, there is a considerable change in character and appearance between the inner and outer estuary with the outer estuary displaying a vast expanse of mudflats.

3.3.18 There is only a single option for the greenway to cross the estuary. This is via the causeway and viaduct. To the south of the estuary the greenway would leave Malahide at the vacant maintenance yard at Bissets Strand. A high palisade fence currently protects the yard and access to the weir maintenance track. The route would follow the maintenance track approximately three metres below the level of the railway and would continue at this level northwards to a pedestrian bridge over the weir constructed upon existing piers. This part of the route would be designed for a higher level of use, encouraging residents of and visitors to Malahide to walk to the weir and back.

3.3.19 The activity and interest of the weir would be an attraction and it is proposed that the railing detail changes to lighter steel profile across the end of the path at the bridge to permit views through the rails of the racing waters of the weir. The pathway would also be widened here to form a viewing area with the inclusion of seating. With the proposed open space at Bissets Strand this would form an attractive and satisfying 'out and back' route from the town for the less adventurous. The greenway would need to rise up by way of steps and ramp to the level of the foot bridge across the weir.

3.3.20 North of the weir, the route continues to rise to run at almost the same level as the railway tracks. It is on this part of the causeway that a true sense of the scale of the estuarine landscape can be perceived, with long ranging views to both the east and the west across the inner and outer estuary. This change in elevation reinforces the distinction between the southern and northern parts of the route across the causeway.

Section 5 – Kilcrea Townland

3.3.21 North of the estuary, the study area embraces the agricultural landscape of the Kilcrea peninsula, from the railway in the east to the Kilcrea Road to the west and north to Newbridge Demesne. The Kilcrea peninsula rises gently from the northern shore to a low ridgeline some 400-600m further north, in a patchwork of arable fields with significant hedgerows and stands of trees.

3.3.22 Although relatively close to the open expanse of the estuary, north of the ridgeline described above, the landscape is relatively small scale and enclosed. This is primarily due to the small size of the fields and the abundance and height of road and field hedgerows.

3.3.23 The railway continues northwards on a lower embankment with a mature hedgerow at its base, until it crosses the River Pill; a narrow, winding river course that flows through low-lying pasture to the north of the ridgeline and discharges into the estuary immediately to the east of the railway. This flat, low-lying area of pasture is an attractive, damp landscape, defined by the numerous watercourses feeding into the River Pill and subdivided by sparse hawthorn hedgerows and is in stark contrast to both the demesnes to the north and west and the estuary to the south and east.

3.3.24 North of the River Pill and west of the railway a wide hardcore maintenance track parallels the railway to the west of the boundary hedgerow. This track deviates westward to skirt around a recently constructed bungalow and joins the Corballis Cottages Road. The route corridor follows the Corballis Cottages Road to Hearse Road and into the Newbridge Demesne.

3.3.25 The River Pill passes under Corballis Cottages Road at a farm complex. To the north of Corballis Cottages, along the River Pill the land is very low-lying, marshy and subject to flooding. The alignment and nature of the river corridor is easily evident from the mature willows and scrub to the banks and within adjacent hedgerows.

3.3.26 The river emerges from beneath the R126, Hearse Road, having flowed from the wooded boundary to the Newbridge Demesne to the immediate north of the road.

3.3.27 To the west of the study area in this section, Kilcrea Road runs southwards from the R126, at the southern gateway to the Newbridge Demesne, towards the north shore of the estuary. The significant demesne boundary wall of Seafield House rises to the west of the road towards the estuary. Elsewhere, banks and hedgerows punctuated with access drives to detached properties, enclose the road. Kilcrea House and cottages are set in a wooded glade to the western end of the ridge that bounds the estuary. The paddocks and stables of Kilcrea Equestrian Centre to the south of the ridge lend a distinctive pattern to the landscape in this area. At the estuary the fields run down to the water and a narrow shingle strand, with wide views over the estuary, the railway causeway, and Malahide.

Section 6 – Newbridge Demesne

3.3.28 This 150 hectare park is an example of an 18th century designed parkland set around a Georgian house, with extensive views across open meadows to heavily planted perimeter woodland belts and stands of historic and more recent tree groupings. In a similar manner to the Malahide Demesne, Newbridge provides a valued amenity for the local communities, although the catchment is smaller, with many walkers and runners evident.

3.3.29 Although primarily an open space amenity, the grounds also have a traditional farm and a restaurant within the courtyard to the house. Sports pitches and a children's playground are also provided for public use.

3.3.30 A car park is set within the heart of the parkland close to the house and this forms the northern end of the greenway. Access to the car park is by way of driveway leading from the R126, Hearse Road, through the parkland. Further to the east along the R126, a second gateway to the demesne would form the area of access for the greenway into the park.

3.3.31 Approximately half way along the drive, some 250 metres from the gateway, a second footpath, called Newbridge Avenue, cuts eastward through the meadows towards Donabate. Donabate adjoins the eastern boundary of the demesne and the railway station within the village provides the potential means of return or arrival (depending on the direction of travel) to, or from, Malahide. Newbridge Avenue forms part of the route, therefore, and is an attractive walkway with a gentle but pronounced topography and areas of interest along the way. Within the park and alongside the footpath, there is a deer enclosure, where the animals can be easily observed, and close to the woodland perimeter there is an historic lime kiln. Passing through the demesne gates, one immediately enters the village of Donabate and soon cross the Square, a rectangular green surrounded by properties, with St Patricks Church of Ireland to the north overlooking The Square. After another 100 metres, the railway station is visible along Turvey Avenue.

Landscape Designations

3.3.32 The Fingal Development Plan 2017-2023, section 5.4 Landscape, contains a Landscape Character Assessment subdividing the county into six different landscape character types (LCTs) (Appendix J-Figure 2). The character of the landscape is determined by a combination of the underlying topography, geology and ecology, overlaid by the components of the landscape dictated by the historic land-uses, for example, the woods, hedgerows and settlement patterns. Furthermore and as stated, 'each landscape type is given a value through the consideration of such elements as aesthetics, ecology, historical, cultural, religious or mythological.'

3.3.33 The high quality of the landscape in which the greenway is proposed is reflected in the landscape designations contained within the Fingal County Development Plan.

3.3.34 The proposed route is located in the Estuary Landscape Character Type. The value attached to this landscape is very high - 'The Estuary Character Type is categorised as having an exceptional value, recognised by the EU designations (candidate Special Areas of Conservation and Special Protection Areas) that apply to each in addition to national designations such as proposed Natural Heritage Areas and Ramsar. The aesthetic quality of the estuaries is also outstanding.'

3.3.35 The quality of the visual landscape of the estuary is recognised by the protection of views from the southern shores northwards over the estuary. The Development Plan outlines objectives for these areas as follows:

- Objective VP01 – Protect views and prospects that contribute to the character of the landscape, particularly those identified in the Development Plan, from inappropriate development.

- Objective VP02 – Resist development such as houses, forestry, masts, extractive operations, landfills, caravan parks and large agricultural/horticulture units which would interfere with a view or prospect of special amenity value, which it is necessary to preserve.

3.3.36 To the north of the estuary at Kilcrea the agricultural lands are zoned 'ha' (high amenity), and designated 'highly sensitive landscape.' The zoning objective seeks to protect and enhance high amenity areas. The zoning vision recognises the amenity potential of these areas and the Fingal Way is open for consideration in this zoning objective.

3.3.37 These lands at Kilcrea are also a designated ecological buffer zone in the County Development Plan. This buffer zone is a roosting habitat for various birdlife species adjacent to the estuary (see Chapter 10.0 – Biodiversity). These buffer zones can provide for low intensity recreational use such as walking and cycling where a proposal will have no significant adverse impact on the habitats and species of interest in the buffer zone.

3.3.38 The River Pill is a recognised habitat and ecological corridor. The fields surrounding the river are subject to riverine and tidal flooding.

3.3.39 The two demesnes of Malahide and Newbridge are both designated Architectural Conservation Area (ACA) status. This is a place, area, group of structures or townscape that is:

- Of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest or value; or
- Contributes to the appreciation of protected structures.

3.3.40 The demesnes are also offered protection under the Development Plan through the that afforded by the designation of the sites as a Designed Landscape – Historic Gardens, Demesnes and Estates. Objectives AH21 and AH22 seek to promote the conservation of historic designed landscapes and ensure that any proposed development is sensitive to, and respects the built heritage elements and green space values of the site. Objective AH23 is particularly pertinent to this proposal as it ensures that infrastructure projects consider and seek to avoid impact on the built heritage and historic designed landscapes. This objective is obviously targeted at detrimental or potentially negative forms of development, for example roadways proposals, but care needs to be taken to ensure that any proposals for signage or pavement construction and detailing take the aims of these objectives fully into account.

3.3.41 Objectives AH37, AH38 and AH39 seek to further and enhance access to and understanding of the heritage of Fingal, which, in principle, would be promoted by these proposals.

3.3.42 Green Infrastructure Mapping Objective 2, seeks to protect the natural and built heritage of the demesnes, and recognises the site as a Highly Sensitive Landscape.

3.3.43 Given the above and in keeping with the designation of the Development Plan, the area is determined as being of High Landscape Sensitivity and Value.

3.4 Summary

3.4.1 The key constraints are identified in the landscape character designations as outlined above.

4.0 Population and Human Health

4.1 Introduction

4.1.1 This chapter discusses and evaluates the existing communal, recreational and economic activities within the study area.

4.2 Methodology

Objective

4.2.1 The objective of the human environment constraints study was to identify existing communal and recreational facilities and economic activities within the study area by collating information from readily available sources. The study was prepared with reference to *Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EIAR)* (EPA, 2017) and *Draft Advice Notes for Preparing Environmental Impact Statements* (EPA, 2015).

Research

4.2.2 A range of documentary, cartographic and photographic sources of information were consulted in this assessment. The primary sources included:

- 2016 Census of Ireland, Central Statistics Office, 2016.
- Fingal County Council Development Plan 2017-2023.
- Broadmeadow Pedestrian & Cycle Trail Feasibility Report, Fingal County Council 2012.
- Maps of the surrounding area, including Ordnance Survey 1:50,000 maps.
- Aerial photographs of the study area.

4.2.3 In addition, a number of community and other websites were visited for up-to-date information on communal and recreational activities available within the study area. A list of these websites is provided in the Bibliography.

4.3 The Existing Environment

Geographic Overview of the Study Area

4.3.1 The study area covers the core of the suburban coastal town of Malahide to the south and the small suburban coastal town of Donabate to the north. Between these two urban settlements lie the Malahide Estuary and its rural hinterland, characterised by predominantly flat estuarine landscape framed by mature demesne planting at its extremities.

Malahide Village

Character of Area and Demographics

4.3.2 Malahide, winner of the 1990 Tidy Towns competition, is located 16km north of the city of Dublin in the administrative county of Fingal. It is characterised by a village-like centre, with extensive residential development to the east, west and south. A unique feature of the settlement is the 109ha former Malahide Castle demesne, which dominates its heart. The first of the housing estates to be built around the village core was Ard na Mara in

1964. Other important residential areas include Biscayne, Chalfont, Gainsborough, Robswall, Seabury, Seapark and Yellow Walls. The settlement experienced its strongest building boom between 1971 and 1990, during which period 41% of its existing stock of private households was constructed. The population in 2016 was 16,550, showing an increase of 4.4% from 2011. Population density is 2,852/km^2.

4.3.3 The settlement demography is dominated by couples and family units comprising a husband, wife and one or more children (Including cohabiting couples with children); these groups constitute 82.7% of the town's households. The 2016 Census revealed that Malahide has a higher percentage of employers, managers and higher professionals than any other town in Ireland. Individuals in these socio-economic groups form 48.0% of the population in Malahide. Of the town's population, 25.9% are children and teenagers aged 18 or under, and 15.0% are aged 65 and over.

4.3.4 Malahide is a popular commuter town. While the majority of its population commutes to school and work by car, 26.4% of commuters travel by bus or train. The town is serviced by DART from Bray and Greystones; by train from Dublin (Pearse Station) and Drogheda/Dundalk; and by Dublin City Bus routes 32A and 42 from the city centre and 102 from Sutton.

Communal, Economic and Recreational Profile

COMMUNAL PROFILE

4.3.5 Communal facilities cover educational, religious, health and other similar needs essential to the social fabric and well-being of urban settlements. A wide range of communal facilities are located in Malahide, reflecting the town's vibrant and self-sustained nature.

4.3.6 Pre-school services in Malahide include the Village Montessori, which operates at Malahide Yacht Club in St James Terrace, and Little Ruggers Montessori located on the Rugby Club premises. Bright Sparks Montessori in Kinsealy Lane, ABC Montessori in Seabury Park, Little Learners pre-school in Seapark and the Irish-language pre-school Tír na nÓg in Estuary Road are located adjacent to the study area.

4.3.7 Malahide is served by four primary and one secondary school. The primary schools include the co-educational Pope John Paul II School (formerly Malahide Girls School) in Sea Road, founded in 1863; St Sylvester's Infant School at the junction of Dublin Road and Yellow Walls Road, built in 1956; a co-educational Church of Ireland St Andrew's National School in Church Road, established in 1824; and St Oliver Plunkett Primary School, which was re-located to Grove Road in 1953. Of these four primary schools, all except Pope John Paul II School are located within the study area.

4.3.8 The only secondary school in Malahide is Malahide Community School in Broomfield. Founded in 1958 and the second largest community school in Ireland with 1,200 pupils, it is a co-educational, inclusive secondary school with pupils from all religious denominations. It is located adjacent to the study area.

4.3.9 Other educational establishments in Malahide include Malahide School of Music, based at St Oliver Plunkett's National School and home to the town's renowned Enchiriadis choir; and the Irish College of English on Church Road. The latter provides all-year-round full-time and part-time language courses for adults, and summer camps for foreign children and teenagers. This school is located within the study area.

4.3.10 Malahide has two Roman Catholic parishes, one Church of England parish and a Presbyterian community. St Sylvester's Roman Catholic Church for Malahide Parish was built on Main Street in 1845 and forms an attractive landmark in the historic core of the town. The Church of the Sacred Heart on Estuary Road serves the Roman Catholic parish of Yellow Walls. Another Roman Catholic contemplative centre in Malahide is St Joseph's Carmelite Monastery in Seapark, which incorporates a church. Of these three churches, only St Sylvester's is located within the study area.

4.3.11 St Andrew's Church of Ireland Church, built in 1822, is located on Church Road and serves the united parishes of Malahide, Portmarnock and St Doulagh's. A Presbyterian Church was built in Dublin Road opposite the Malahide Castle Gates in 1956 for the united parishes of Howth and Malahide; it is the first Presbyterian Church built in Ireland since the country became a republic. Both churches are within the study area.

4.3.12 The HSE-run Malahide Health Care Centre is located on New Street within the study area. In addition, there are a number of private dentists and physical and mental health practitioners in town. The nearest general hospital is Beaumont Hospital in Dublin 9.

4.3.13 Nursing homes in Malahide include Talbot Lodge in Kinsealy Lane. St Benedict's House on Estuary Road is a complex of 37 homes built and managed by the Society of St Vincent de Paul for older people capable of independent living. Both facilities are located adjacent to the study area.

4.3.14 Other communal services within the study area in Malahide include a Garda Station in St James's Terrace, a Credit Union on Main Street and a Library on Main Street. A Citizens' Information Centre is also located in the library building. The fire station in Malahide was closed in January 2007, and the nearest one is now in Swords. The recycling centre on Estuary Road is adjacent to the study area.

4.3.15 Malahide has more than twenty residents' associations, many of whom work together through the Malahide Community Forum, which publishes a quarterly newsletter, *The Malahide Guardian*. These associations include (but are not limited to) Malahide Chamber of Commerce, Malahide Tidy Towns, Malahide Lions Club, Meals on Wheels, Rainbows (peer support for children and adolescents) and Senior Citizens Committee. Many of these community groups utilise the Grand Hotel or the Parish Hall on Old Street for their meetings. The town also has a camera club, a musical and drama society, a chess club and a photography group. Additional group activity takes place in Malahide Library, which serves as a venue for a parent and toddler group, Irish conversation group, breast feeding support group, two film clubs, scrabble club, creative writing group, chess club for children and young adults, and several book clubs. It also has a permanent exhibition space for artwork.

4.3.16 Malahide Historical Society was formed in 1978. From 1988 to 2012 it operated a Cottage Museum in the grounds of Malahide Castle which however had to be vacated owing to the commercial development of the courtyard area where the museum had moved in 2007. The society is currently in negotiation with Fingal County Council for suitable alternative accommodation.

ECONOMIC PROFILE

4.3.17 Economic facilities, such as retail and other commercial services, are essential to the vitality of a settlement. In spite of its proximity to Dublin City, Malahide has an

exceptionally diverse range of retail facilities and other commercial and business services. These are predominantly located in the town centre, particularly on Main Street, New Street and the Diamond. Especially prominent among the town's retail outlets are boutiques specialising in designer and high street labels for men, women and children; and shops specialising in gourmet foods, wine and delicatessen. Another characteristic feature is the predominance of hair and beauty salons. The wide array of cafés, bistros and restaurants, offering not only traditional Irish but continental and international fare, and large number of guest houses and B&B-style accommodations, together with the 150-room Grand Hotel, suggests that tourism plays a not insignificant role in the town's commercial life. The self-contained nature of the settlement is further evident in the notable concentration of business services (mainly solicitors, chartered accountants and financial services) in the town centre.

RECREATIONAL AND AMENITY PROFILE

4.3.18 Residents in Malahide enjoy an exceptionally diverse range of recreational facilities, which provide opportunities for a wide range of activities, from informal ones such as walking to organised sports within a club structure.

4.3.19 The 109ha Malahide Demesne, located in the heart of Malahide, offers a variety of informal sports activities, including children's playgrounds, a 9-hole par-3 golf course, an 18-hole pitch and putt course, lawn tennis and basketball courts and a boules area. There is also an extensive system of gravelled and grass field pedestrian paths for exploring the park, with wooden exercise points along the way. The perimeter walk is c. 4.5km. Malahide Castle and Gardens are open to the public and incorporate a large Avoca food hall and gift shop opened in 2012.

4.3.20 A number of other walks, both coastal and inland, are available within and in the immediate vicinity of Malahide. The Malahide to Portmarnock coastal walk is c. 4km in length. At Portmarnock, the walk can be extended to include the 2.5km stretch of Portmarnock beach or any of the hillside trails within the c. 37ha Robswall Park, adjacent to the study area. To the west of Malahide, a 7km Estuary Walk links Malahide to Seabury and onto Swords.

4.3.21 Organised sports activities in Malahide include rugby, soccer, GAA, hockey, basketball, cricket, golf and lawn tennis.

4.3.22 Malahide Rugby Club was founded in 1922. Lord Talbot was the club's patron and matches were initially played in Malahide Castle grounds. The club was forced to disband in 1944 due to lack of available players, but was re-formed in 1978. In 1989, the club purchased their own land on the Back Road, opposite Malahide Castle, and their clubhouse and pitch were officially opened in 1992. A new clubhouse and two rugby pitches were later built at Estuary Road, which is the club's present location. Malahide Rugby Club fields three senior men's teams, one women's team, and several youth and 'mini' rugby teams. The present location of Malahide Rugby Club is adjacent to the study area.

4.3.23 There are two soccer clubs in Malahide. Malahide United AFC was founded in 1944 and currently fields 50 children's teams and four senior teams. With over 1,000 registered players, it is one of the largest football clubs in Ireland. The home ground is Gannon Park on Corballis Cottages Road, which comprises a clubhouse and several pitches, including floodlit and/or all-weather pitches. The club location is adjacent to the study area. The

club also avails of two pitches on the grounds of Malahide Castle, which are within the study area, and one in Robswall Park, which is adjacent to the study area.

4.3.24 The second soccer club in Malahide is Aston Village FC. It was established in 1994, and its current home ground is Malahide Demesne within the study area. The club has about 100 members and three senior teams.

4.3.25 St Sylvester's is the local GAA club. It was founded in the early 1900s and plays hurling and Gaelic football. The club fields several teams for men, women and children. The clubhouse in located on Church Road (within the study area), with pitches on the grounds of Malahide Demesne (within the study area) and at Broomfield (adjacent to the study area).

4.3.26 Malahide Hockey Club has been amalgamated with Fingal Hockey Club to become Malahide Fingal Hockey Club. They field three senior teams and several junior teams. All teams play and train on their all-weather pitch in Broomfield, adjacent to the study area.

4.3.27 Malahide Basketball Club was formed in 1977 and fields two senior women's teams, two senior men's teams and several junior teams. They train and play all their home matches at Malahide Community School.

4.3.28 Malahide Cricket Club was founded in 1861 and is situated within Malahide Castle demesne within the study area. The cricket ground has capacity for 12,000 spectators and is built in line with international specifications. The club has over 400 members and is open all year round. It has 48 teams for men, women and children. The premier teams compete at the highest grade of cricket played in Ireland.

4.3.29 Malahide Golf Club was founded in 1892 by the Irish landscape painter Nathaniel Hone, and is one of the oldest golf clubs in Ireland. The club moved to its current premises at Beechwood (adjacent to the study area) in 1990, with a 27-hole course layout designed by Niall Hackett.

4.3.30 Malahide Lawn Tennis & Croquet Club was founded in 1879 and was originally based on the grounds of Malahide Castle. It later moved to its current premises on The Square to the immediate east of the town centre. The current clubhouse dates from 1992. The club has some 1,500 members and was voted National Club of the Year in 2006. The club retains the name 'croquet' in its name although no croquet facilities remain at the club.

4.3.31 Malahide also offers a number of water-based recreational activities. These are examined in greater detail below in paragraphs 4.3.33 to 4.3.38.

Railway Causeway (Malahide Estuary)

Character of Area

4.3.32 The Malahide Estuary (inner) covers an area of 3.3km^2. The construction of a railway viaduct in the 1840s has resulted in the estuary having lagoon characteristics, with limited tidal exchange. It is an important wintering bird site and holds an internationally important population of Brent Geese and nationally important populations of 15 other species.

Recreational and Amenity Profile

4.3.33 Water based recreational activities are a vital component of the estuary. There are two sailing clubs situated on the estuary: Malahide Yacht Club and Swords Sailing & Boating Club. Malahide Yacht Club is the only sailing club on the British Isles with two separate sailing waters and two clubhouses. The main clubhouse is located at St James's Terrace in the outer estuary (within the study area) and its sailing waters cater for keelboat sailing and racing. The new clubhouse at the inner estuary (adjacent to the study area) was opened in March 2012 to cater for dinghy sailing and racing. The club provides junior and adult training courses and hosts regattas and championships.

4.3.34 Swords Sailing & Boating Club was founded in 1974. Its clubhouse and dinghy pen are located near Estuary Road, adjacent to the study area. The club owns a fleet of sail boats which are used for club events and training.

4.3.35 Malahide Marina is located to the immediate east of the railway causeway. It has 350 fully serviced berths and a purpose-built covered boatyard with capacity for the storage of 180 boats.

4.3.36 Fingal Sailing School is located within the study area at The Haven. It provides tuition in stand up paddle boarding (SUP), windsurfing, sailing and kayaking for children and adults, and organises summer camps and other water sports events.

4.3.37 Malahide Sea Scout Group was established in 1919 and is currently based in St James Terrace. With 510 members, it is the largest Sea Scout group in Europe. The club provides scouting activities with a nautical flavour to children and young adults from 6 to 26 years of age and participates in international jamborees.

4.3.38 The 2km Velvet Strand in Malahide is popular with bathers. Fishing in the estuary is permitted but there is no organised fishing activity.

Kilcrea Townland

Character of Area

4.3.39 The townland of Kilcrea and the adjoining townlands of Ballymadrough and Donabate form part of the Donabate-Portrane peninsula. The area is largely rural in nature and remains predominantly in agricultural use. The townland's settlement comprises individual households along Kilcrea Road and Corballis Cottages Road, with no commercial outlets and no communal facilities.

Recreational and Amenity Profile

4.3.40 A limited amount of bathing and windsurfing takes place along the northern shore of the Malahide Estuary. The coastal road which bounds Kilcrea townland is used for walking, with the viewing area at the southern end of Kilcrea Road doubling as a small car park.

4.3.41 Kilcrea Equestrian Centre was opened in July 2011. It is located within the study area near the northern bank of the estuary, to the east of Kilcrea Road. The centre offers riding lessons for all age groups and experience levels in a controlled setting, trekking along the estuary, and indoor and outdoor livery service for privately owned horses.

Newbridge Demesne/Donabate

Character of Area and Demographics

4.3.42 Donabate is a small coastal suburban town between Malahide Estuary to the south and Rogerstown Estuary to the north. It is located 20km north-northeast of the city of Dublin in the administrative county of Fingal and shares close links with the neighbouring town of Portrane, with which it is partly merged. It remained a small village until well into the twentieth century (with a population of 734 in 1911), when road improvements and the presence of a railway station resulted in rapid population growth. The population in 2016 was 7,443, showing an increase of 9.8% from 2011 and 35.3% from 2006. Population density is 3,887/km^2, the fifth highest in Ireland.

4.3.43 The settlement demography is largely characterised by family units comprising a husband, wife and one or more children (Including cohabiting couples with children); this group constitutes 51.3% of its households. The most dominant socio-economic groups present in the town are employers and managers; lower professional; and non-manual, which form 60.9% of the population in Donabate. Of the town's population, 34.9% are children and teenagers aged 18 or under, and just 4.4% are aged 65 and over.

4.3.44 Donabate is serviced by the Dublin-Belfast railway line and the Northern Commuter line between Dublin and Dundalk. The regional road R126, which connects Portrane to the R127 and the M1 motorway, runs through the town. Dublin Bus service 33B from Swords to Portrane also serves Donabate.

Communal, Economic and Recreational Profile

Communal Profile

4.3.45 The communal facilities available in Donabate reflect the town's relatively young population base. Pre-school services in the town include Rainbow Playschool and Montessori, which is located at the Donabate Portrane Community and Leisure Centre on Portrane Road; there are also a number of private crèches and playschools within the town.

4.3.46 Three primary schools are located in Donabate. St Patrick's Girls National School on Portrane Road has c. 430 pupils. The present school building dates from 1959, and has been extended several times. It is adjoined by St Patrick's Boys National School, formerly known as Portrane Boys' National School. It moved to its present site in 1980, and was further extended in 2000. Both schools provide religious education in accordance with the tradition of the Roman Catholic Church.

4.3.47 Donabate Portrane Educate Together National School is located on Beaverstown Road. This multi-denominational public primary school operates under the patronage of Educate Together. Opened in 2002, it moved into permanent premises in 2011.

4.3.48 The town's only secondary school is Donabate Community College. Originally located on temporary premises within the Donabate Portrane Community and Leisure Centre, it moved to new, custom-built premises on Portrane Road in 2011. This multi-denominational school has c. 450 pupils.

4.3.49 Religious establishments in Donabate look after the spiritual needs of Roman Catholic, Church of Ireland and Presbyterian congregations. St Patrick's Roman Catholic Church

on Main Street is one of three churches in the united Donabate, Portrane and Balheary Parish. It was built in 1903 to replace an older church from 1802, which has been converted into a parish hall.

4.3.50 St Patrick's Church of Ireland Church on The Square is one of three churches in the united parish of Swords and Donabate. Of medieval origin, it was partly rebuilt in the eighteenth century. The Presbyterian community in Donabate does not have a church; instead, they meet on Sundays at the Donabate Portrane Community Centre on Portrane Road.

4.3.51 Health care services in Donabate include the Family Medical Centre on Portrane Road and Donabate Clinic in Fairways Mall, Main Street. A small number of private practices are also available in the town. The nearest hospital is Beaumont Hospital in Dublin 9. St Michael's House, a residential and respite home catering for the needs of people with intellectual disabilities, is located off Portrane Road, adjacent to Donabate Portrane Community and Leisure Centre. No nursing homes were identified within the study area.

4.3.52 Other communal services within the study area in Donabate include a Credit Union on Portrane Road and recycling centres at Beach car park and SuperValu car park. A mobile library visits the town once a week. The Citizens' Information Centre in Swords provides a weekly outreach service in Donabate Shopping Centre. The nearest Garda station and fire station are in Swords.

4.3.53 Donabate has a number of residents' associations. These include (but are not limited to) Donabate and Portrane Community Council, Donabate and Portrane Chamber of Commerce, Donabate Tidy Towns and Donabate Historical Society. Many of these associations use the Donabate Portrane Community and Leisure Centre for their meetings. The town is also part of the Transition Towns movement, a network of communities aiming to build local ecological resilience by reducing energy usage and reliance on long supply chains.

Economic Profile

4.3.54 Donabate has a range of basic retail facilities and other commercial and business services. They are predominantly located on Main Street and are typically food stores, service stations, hardware and electronic stores. The designer and gourmet stores which typify the streetscape in Malahide are absent in Donabate. This pattern is typical of commuter towns and suggests that except for the most basic items local residents do their shopping in neighbouring urban areas, in this case Swords, Malahide and Dublin city. The limited availability of restaurants and virtual absence of guest accommodation indicates an absence of tourism.

Recreational and Amenity Profile

4.3.55 Residents in Donabate enjoy a diverse range of recreational facilities, which provide opportunities for both informal activities, such as walking, to organised sports within a club structure.

4.3.56 Newbridge Demesne which adjoins the town to the west has significant amenity value to local residents. Its 150ha demesne contains a large traditional farm with old breeds of farm animals, children's adventure playground, sports pitches, pleasure grounds and extensive woodland walks. The house is open to the public and incorporates a gift shop and a café.

4.3.57 Donabate Portrane Community and Leisure Centre on Portrane Road opened in 2001 and offers a wide range of activities for children and adults. Activities aimed at children include mother and toddler groups, taekwondo, fitness classes, junior hockey, mini tennis, soccer, animation art, ballet, Irish dancing and cheerleading. Activities for adults include gym and fitness classes, Pilates, Krav Maga, taekwondo, tai chi, art classes and bingo.

4.3.58 Organised sports activities in Donabate include soccer, GAA, hockey and golf. There are two soccer clubs in Donabate. St Ita's Athletic Football Club has been active from the early 20th century and has c. 350 members. Its main pitch is on the grounds of St Ita's Hospital (adjacent to the study area) and its teams also play on pitches in Ballymastone (adjacent to the study area) and Newbridge Demesne. The main pitch of Portrane Athletic is located on Portrane Road adjacent to the study area.

4.3.59 St Patrick's GAA Club was founded in 1913 and reformed in 1924, after a hiatus brought on by the Easter Rising and the First World War. With almost 800 members, it is the biggest sporting organisation in the Donabate-Portrane peninsula. The club plays hurling and Gaelic football and fields several teams for men, women and children. The club is based in Ballymastone (adjacent to the study area) where it has a clubhouse, three full-size pitches, juvenile pitches and a training area.

4.3.60 The Portrane Hockey Club was founded in 1919 and fields both senior and junior teams. It plays its indoor matches in the Community and Leisure Centre in Donabate and its outdoor matches in the ALSAA complex in Swords (adjacent to the study area).

4.3.61 Donabate is well known for its high concentration of golf courses, all of which are adjacent to the study area. Beaverstown Golf Club was founded in 1985 and has an 18-hole course designed by Eddie Hackett. The Island clubhouse and 18-hole course are located in Corballis. Donabate Golf Club has a 27-hole golf course, the three nine hole courses being playable in any combination. Balcarrick Golf Club was founded in 1972. Originally named Dublin & County Golf Club, it moved to its present location in Corballis 1992, where it maintains an 18-hole course. Corballis Links Golf Club was established in 2004 and has over 500 members. Its 18-hole course was partly redesigned by Ron Kirby.

4.3.62 Kayaking, sailing and wind surfing are popular water sports in the Malahide Estuary, with the nearest marinas in Rush and Malahide. However, no organised water sports activity was identified in Donabate except for Donabate and Portrane Sea Scouts whose headquarters are based in the centre of Donabate.

4.3.63 Popular walking routes in the area include the Donabate to Portrane route which commences from the railway causeway at Donabate and extends eastwards along the north shore of Malahide Estuary and then north by Corballis Golf Course to the Martello tower beside the Waterside Hotel. The route incorporates informative display boards.

4.3.64 The cliffs between Donabate and Portrane are occasionally used for bouldering.

4.4 Summary

4.4.1 The study area is characterised by the Malahide Estuary which is flanked to the south and north by the urban centres of Malahide and Donabate. There is an interesting symmetry between the two settlements in that both enjoy the proximity of a former country estate which was developed into a valuable local amenity – Malahide Demesne in the heart of Malahide and Newbridge Demesne to the immediate west of Donabate.

4.4.2 While both settlements can be characterised as coastal towns, they demonstrate marked differences. Donabate has a younger age profile and can best be described as a commuter town, with good communal facilities and a range of retail and other commercial businesses sufficient to meet its basic needs. Malahide on the other hand is noticeably self-sustained and its considerable range of designer boutiques, specialist food and wine stores, restaurants and cafés reflects the high socio-economic status of its slightly more mature population base and indicates that tourism plays not an insignificant role in the town's commercial life.

4.4.3 What connects the two communities is the importance they both place on recreation and amenity. It is not unreasonable to suggest that the presence of a large green amenity area in both towns has encouraged and contributed to an interest in outdoor recreation. While organised sports activity dominates both communities, the demesnes of Newbridge and Malahide with the pedestrian walkways, picnic areas and children's playgrounds provide the two communities with green oases and ample opportunity for informal outdoor activity. Such amenity assets, coupled with the attractive backdrop of the Malahide Estuary, have created two vibrant communities, each with its different profile but equally attractive for work, rest and play.

5.0 Architectural Heritage

5.1 Introduction

5.1.1 This chapter discusses and evaluates structures of architectural heritage merit within the study area. The term 'architectural heritage' is here used as defined in the Architectural Heritage (National Inventory) & Historic Monuments Act, 1999, to mean all:

- structures and buildings together with their settings and attendant grounds, fixtures and fittings,
- groups of such structures and buildings, and
- sites which are of architectural, historic, archaeological, artistic, cultural, scientific, social or technical interest.

5.1.2 Architectural heritage and archaeology together form Ireland's built heritage. As the dividing line between the two disciplines is not clear-cut, this chapter should be read in conjunction with Archaeology and Cultural Heritage (Chapter 6.0). Unlike some archaeological heritage, architectural heritage generally has a strong visual presence in the landscape, particularly in the case of gardens, parklands and other designed grounds. This chapter should therefore be also read in conjunction with that relating to Landscape (Chapter 3.0).

5.2 Methodology

Objective

5.2.1 The objective of the architectural heritage constraints study was to identify structures and features of known architectural heritage merit within the study area by collating information from readily available sources. The study was prepared in compliance with the *Guidelines for the Assessment of Architectural Heritage Impact of National Road Schemes* (TII (formerly the NRA) 2005) and *Architectural Heritage Protection Guidelines* (DoEHLG, 2004).

Research

5.2.2 A broad range of documentary, cartographic and photographic sources were consulted in order to locate, identify and quantify sites of perceived architectural heritage value within the study area that may impact on the route selection process. The primary sources included:

- First, second and third edition Ordnance Survey maps;
- Discovery series maps;
- Up-to-date aerial photographs;
- Fingal Development Plan 2017-2023 for Records of Protected Structures (RPS) and Architectural Conservation Areas (ACA);
- Record of Monuments and Places (RMP);
- Record of Historic Monuments (RHM);
- Permanent and Temporary Preservation Orders (PO, TPO) maintained by the Department of Culture, Heritage and the Gaeltacht;
- List of National Monuments maintained by the Department of Culture, Heritage and the Gaeltacht;

- Archaeological Survey of Ireland (ASI) database;
- NIAH Architectural Inventory of Fingal;
- NIAH Gardens and Landscapes Survey for Fingal;
- Published documentary sources as detailed in the Bibliography.

5.3 Statutory Protection of Architectural Heritage

5.3.1 In Ireland, the primary means of protecting the architectural heritage are Part IV of the Planning and Development Act 2000 (as amended), the National Monument (Amendments) Act 1930 to 2004, the Heritage Act 1995, the relevant provisions of the National Cultural Institutions Act 1997 and the Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act 1999. Other mechanisms include the Roads Act 1993 and 2007. The government's policies are relayed in the *Architectural Heritage Protection Guidelines for Planning Authorities* (Department of Arts, Heritage and the Gaeltacht 2011) and *Government Policy on Architecture 2009-2015*.

5.3.2 European and international guidance includes the Charter for the Conservation and Restoration of Monuments and Sites (Venice 1964); the Convention for the Protection of World Cultural and National Heritage (1972); and the 1985 Council of Europe Convention on the Protection of the Architectural Heritage of Europe. This so-called Granada Convention was ratified by Ireland in 1997, resulting in the establishment of the National Inventory of Architectural Heritage (NIAH) to produce inventories and provide guidance to local authorities on Ireland's building stock.

Registered Architectural Heritage Sites

5.3.3 Stemming from the principal conventions, acts and regulations which govern architectural heritage, there are several mechanisms for protecting architectural heritage sites in Ireland. These include the following:

- *National Monuments*: Section 8 of the National Monuments (Amendment) Act 1954 provides for the publication of a list of monuments, the preservation of which is considered to be of national importance. The Minister can acquire any national monument either through compulsory order or through agreement. The Minister or local authority can appoint themselves guardians of any national monuments other than dwellings. The owner of a national monument, once it is not a building being occupied as a dwelling house, can appoint either the Minister or the local authority as guardian of the monument with the agreement of the state or local authority. Ministerial consent must be granted before any works are carried out with respect to a national monument. There are no national monuments listed within the study area.

- *Preservation Orders (PO) and Temporary Preservation Orders (TPO)*: The National Monuments Act 1930 provided for the making of Preservation Orders to protect national monuments that were considered to be under threat. A preservation order makes it unlawful to interfere in any way with a national monument without the expressed permission of the Minister. There are no sites of architectural heritage merit within the study area that are currently subject to preservation orders (temporary or full).

- *Register of Historic Monuments (RHMs)*: Under Section 5 of the National Monuments (Amendment) Act 1987, the Minister for Culture, Heritage and the Gaeltacht is required to establish and maintain the Register of Historic Monuments. Two months' notice must be given in writing to the Minister in advance of any proposal to carry out work in relation to a historic monument or archaeological area entered in the Register. There are no sites of architectural heritage merit listed in the Register of Historic Monuments within the study area.

- *Record of Monuments and Places (RMP)*: Section 12(1) of the National Monuments (Amendment) Act 1994 provides that the Minister for Culture, Heritage and the Gaeltacht establish and maintain a record of monuments and places. Sites recorded on the Record of Monuments and Places all receive statutory protection under the National Monuments Act 1994. Two months' notice must be given in writing to the Minister in advance of any proposal to carry out work in relation to a site listed in the Record of Monuments and Places. Ten RMP sites of architectural heritage merit are recorded from within the study area, as listed in Table 1 in Appendix A.

- *Record of Protected Structures (RPS)*: Buildings recorded in the RPS can include recorded monuments, structures listed in the NIAH or buildings deemed to be of architectural, archaeological or artistic importance by the Minister. Such sites receive statutory protection from injury or demolition under the 1999 Planning Act. All current RPS sites in Fingal are listed in the County Development Plan. There are 43 sites included in the Record of Protected Structures within the study area, as listed in Table 2 in Appendix A. In addition, there are 44 protected structures within the Architectural Conservation Area of the Historic Core of Malahide (AHC 017). These structures have been considered as part of the ACA rather than individually in this study.

- *Architectural Conservation Areas (ACAs)*: The County Development Plan includes areas designated as Architectural Conservation Areas. The stated objective of ACAs is to conserve and enhance their special character, including their traditional building stock and material finishes, spaces, streetscapes, landscape and setting. There are four ACAs within the study area, as listed in Table 3 in Appendix A.

- *National Inventory of Architectural Heritage*: The built heritage is protected under the Heritage Act 1995, The Architectural Heritage (National Inventory) and National Monuments (Miscellaneous Provisions) Act 1999 and the Local Government (Planning and Development) Acts 1963-1999. The Architectural Heritage (National Inventory) and National Monuments (Miscellaneous Provisions) Act 1999 provides for the establishment of a National Inventory of Architectural Heritage (NIAH). There are 37 published Architectural Inventory sites within the study area, as listed in Table 4 in Appendix A.

Unregistered Architectural Heritage Sites

5.3.4 These include sites that are considered to be of potential architectural heritage value but which do not appear on any of the lists outlined above. Many of these sites considered are named buildings on the OS six-inch maps such as bridges, mills, schools, post offices, police barracks, railway and canal features, and country houses and associated demesnes. There are seven unregistered architectural heritage sites in the study area, as listed in Table 1 in Appendix B.

5.4 Assessment of Constraints

Identification of Key Constraints

5.4.1 An integral part of the constraints study is the identification of key constraints. These comprise architectural heritage sites that, by their nature, are deemed worthy of highlighting for particular consideration. When assessing key constraints a holistic approach was taken, which incorporated the following criteria:

- Legal Status.
- Condition.
- Historical associations.
- Amenity value.
- Ritual value.
- Specimen value.
- Group value.
- Rarity.

5.5 Perceived Importance of Sites

5.5.1 Each structure included in the constraints study is individually assessed to establish its perceived (not necessarily definitive) importance. The assessment of perceived importance is based on professional judgment of the information to hand, framed within the confines of the constraints study. For the purpose of this study, the rating values outlined by the NIAH were adopted, whereby the following meanings shall apply:

Rating Value	Definition
International	Structures or sites of sufficient architectural heritage importance to be considered in an international context. Examples include St Fin Barre's Cathedral, Cork. These are exceptional structures that can be compared to and contrasted with the finest architectural heritage in other countries.
National	Structures or sites that make a significant contribution to the architectural heritage of Ireland. These are structures and sites that are considered to be of great architectural heritage significance in an Irish context. Examples include Ardnacrusha Power Station, Co. Clare; the Ford Factory, Cork; Carroll's Factory, Dundalk; Lismore Castle, Co. Waterford; Sligo Courthouse, Sligo; and Emo Court, Co. Laois.
Regional	Structures or sites that make a significant contribution to the architectural heritage within their region or area. They also stand in comparison with similar structures or sites in other regions or areas within Ireland. Examples would include many Georgian terraces; Nenagh Courthouse, Co. Tipperary; or the Bailey Lighthouse, Howth. Increasingly, structures that need to be protected include structures or sites that make a significant contribution to the architectural heritage within their own locality. Examples of these would include modest terraces and timber shopfronts.
Local	These are structures or sites of some vintage that make a contribution to the architectural heritage but may not merit being placed in the RPS separately. Such structures may have lost much of their original fabric.

5.5.2 It should be noted that on a site-by-site basis, the levels of perceived architectural importance are liable to future revision where new information is brought to bear, either through more detailed investigations, surveys or research. The classification of levels of

perceived importance is therefore based merely on an appraisal of current information and an assessment of importance probability.

5.5.3 The following provides a summary overview of the relative importance of identified sites as perceived by the study.

- International Importance: There are no sites deemed to be of International Importance within the study area.
- National Importance: There are six sites deemed to be of National Importance within the study area as listed in Table 1 in Appendix C.
- Regional Importance: There are 53 sites deemed to be of Regional Importance within the study area as listed in Table 2 in Appendix C.
- Local Importance: There are six sites deemed to be of Local Importance within the study area as listed in Table 3 in Appendix C.

Definition of the Term 'Demesne'

5.5.4 The study area contains a small concentration of demesnes in the environs of Malahide and Donabate. In conservation terms, demesnes are seen to have a high richness factor and a high sensitivity rating as they contain many heritage features, both built and natural. The peak period of demesne development in Ireland occurred between c. 1700 and 1850. It went into decline with the introduction of the Wyndham Act after 1900, and the economic conditions which followed the Second World War.

5.5.5 No legal definition of the term 'demesne' exists. Demesnes cannot be defined by their age, size – which can range from a few hectares to several thousand – or current ownership, since demesne features can remain clearly distinguished even when the demesne land is divided into multiple ownerships. The Oxford Dictionary defines a demesne as 'a manor house, and the land adjacent or near, which is kept for the owner's use as distinguished from tenanted land'. The same sentiment is reflected in the *Architectural Heritage Protection Guidelines for Planning Authorities* (Department of Arts, Heritage and the Gaeltacht, 2011), in which a demesne is described as 'that part of the historic estate associated with a country house which was reserved for the personal use and enjoyment of the owner'. The most characteristic elements commonly found on demesnes include (but are not limited to) features such as boundary and garden walls, utilitarian structures such as ice houses, coach houses, farmyards and outbuildings, ornamental features such as gazebos, follies, gate lodges, and (less frequently) statuary, and landscape elements such as avenues and walkways, tree belts, wooded shelter belts, parkland, gardens, vistas, ornamental ponds and other water features.

5.5.6 Statutory protection regarding demesnes also remains a grey area. No protection is afforded to demesnes in their own right, however it is implied in Part IV Architectural Heritage of the Planning and Development Act, 2000, which defines a protected structure as including:

(i) the interior of the structure;
(ii) the land lying within the curtilage of the structure;
(iii) any other structures lying within that curtilage and their interiors; and
(iv) all fixtures and features which form part of the interior or exterior of any structure or structures referred to in subparagraph (i) or (iii).

5.5.7 During desktop study, demesne boundaries were initially identified by consulting the first edition Ordnance Survey maps in which demesnes in Co. Dublin are highlighted in dark shading. To further aid the identification of landscaped grounds not highlighted on the maps, any substantial domestic buildings and their surroundings named on them were compared against up-to-date aerial photography. Wood belts, tree boundaries and other clearly definable linear landscape elements were used to provide tentative demesne outlines. These are subject to change following site visits and detailed field work.

5.6 The Receiving Environment

Geographic Overview of the Study Area

5.6.1 The study area covers the historic core of the suburban coastal town of Malahide, a section of the Malahide Estuary, and the small suburban coastal town of Donabate. The area is characterised by predominantly flat estuarine landscape with low lying pastures and small fields, framed by mature demesne planting at its extremities.

Historical Overview of the Study Area

5.6.2 The following provides a summary overview of the history of the architectural heritage within the receiving environment of the study area.

Malahide

5.6.3 A pre-Christian habitation site, Malahide began to develop as a settlement in the eighth century when the Viking traders made their home in the Malahide Estuary before establishing Dublin as their base. The origin of the name Malahide is unclear. It may have derived from *Mullach Íde* (the hill of Íde), *Mullach h-Íde* (sandhills of the Hydes) or *Baile Átha Thíd* (the town of the ford of Thíd).

5.6.4 In 1185, Sir Richard de Talbot, a knight of French extraction who had accompanied Henry II to Ireland during the Anglo-Norman invasion, was granted the lands and harbour of Malahide. Here, he built a three-storey tower house, Malahide Castle, which the subsequent generations of the family were to embellish and enlarge, most notably in the reign of Edward IV (1442-1483), when the Great Hall was added, and in the reign of Charles II (1660-1685), when most of the outworks and the defences of the castle were demolished. As was customary among Anglo-Irish settlers, the Talbots also founded and endowed Malahide Abbey, which replaced Malahide's first church (dedicated to St Fenivus) as the parish church until the dissolution of monasteries in the reign of Henry VIII (1509-1547).

5.6.5 Throughout the middle ages, the Malahide Estuary played an important commercial role to the inhabitants of Malahide, noted as it was for its rich supply of fish. The town enjoyed a substantial trade in herring and whitefish and imported quantities of salt from Chester and Bristol for the preservation of its stock. In 1476, Edward IV granted Thomas Talbot all the customs of goods passing through the port of Malahide and appointed him and his heirs perpetual Admirals of Malahide. In 1547, Malahide was described as one of the chief haven towns of Ireland because of the safety of its harbour.

5.6.6 During the 18th and 19th centuries, a substantial fleet operated out of the estuary, trading in cod, ling, herring, mussels, cockles and winkles. Another important resource was oysters, which were grown in large beds in the location of the present railway viaduct. These were owned by the Talbot family who also patronised and encouraged

other types of commerce in the area. In 1783, Colonel Richard Talbot established a cotton mill to the west of Malahide at a location which became known as Yellow Walls from the yellow dye stains left by produce placed on the walls to dry in the sun. The mill was enormously successful, with 'more spindles at work… than any other Cotton Mill had at work in Ireland' and expanded the hamlet of six houses in which it was located to a centre larger in size than Malahide. Richard Talbot was also responsible for improving the local road network by several road-widening works, the erection of turnpike gates and the recovery of tolls between Dublin and Malahide.

5.6.7 Malahide Castle underwent a number of structural changes in the course of the 18th century, most notably between 1765 and 1782, when the west wing was reconstructed following a fire and new drawing rooms were added. Two circular turret rooms were also built, and the north wing of the castle developed. Toward the end of the century, the family built a cottage ornée, a thatched building of picturesque design, across the road from the north entrance to Malahide Castle. Known as the Casino, it is said to have been used by the family as a shooting lodge, but undoubtedly also acted as an attractive focal point at the entrance to Malahide town.

5.6.8 At the start of the 19th century, Malahide was a small but bustling development. Fishing continued to be its main business but the town also operated a ribbon factory, sawyer's factory, steam bakery, salt works and gas works, which among other things provided street lighting. Local exports included cod liver oil, grain, meal and flour, while the most important significant imports were slate, timber and large quantities of coal, used predominantly for the manufacture of gas. In the course of the second half of the century, with the arrival of the railway, the development of Dublin Port and the closure of the gasworks, maritime trade gradually ceased.

5.6.9 The arrival of the railway in 1844 marked the gradual transformation of Malahide into a tourist resort and residential town. The construction of the line took nine years and involved the building of an eleven-span wooden viaduct over the Malahide Estuary. Some 90,000 tons of stone were discharged along the line in an attempt to overcome the problem of scour produced by tidal currents. The first train, carrying 565 passengers in seven coaches, pulled into Malahide Station on 17 March 1844. A popular visitor attraction in the town was Malahide Baths, a series of hot- and cold-water baths located at the back of the Royal Hotel. The hotel, later renamed the Grand Hotel, had been built by James Fagan in 1835, and enjoyed considerable trade from railway passengers, particularly at the turn of the 20th century when the Great Northern Railway Company began to issue combined weekly rail and hotel tickets.

5.6.10 The town developed its present layout in the course of the 19th century. At its core is the Diamond, or town centre, from which four streets radiate to north, south, east and west. A sprinkling fountain which originally stood in the junction was removed in c. 1870 to make room for stage and other large coaches. The Mall, extending to the east and west of the junction, was originally constructed as a promenade to the Grand Hotel. To the north of it, diagonally across from the Grand Hotel, were the Pleasure Gardens with serpentine wooded walks where military bands played in the summer and where displays of various kinds were held on special occasions, such as the Malahide Regatta. New Street, extending to the north of the Diamond, forms the commercial heart of the town, while Church Street to the south contains a range of handsome Regency and Victorian terraced buildings. Similar elegant terraces were constructed along The Mall and the seafront, emulating in their design the seaside elegance of Brighton and other English coast towns. The former main street, Old Street, was inhabited by tradesmen

and artisans and comprised 26 neat thatched cottages with diamond-paned windows. Public building works in the 19th century included the construction of St Andrew's Church of Ireland Church in 1832, the Roman Catholic Church of St Sylvester in 1837 and Malahide Cricket Clubhouse in 1861. Early 20th-century additions to the town's streetscape include the Carnegie Library, constructed in 1909 of Portmarnock brick to the design of Anthony Scott, and the Presbyterian Church designed by William Baird in 1956. It is the first church of its kind to be built in the Republic after independence.

5.6.11 In 1965, the original timber viaduct on the Malahide Estuary was replaced by a 12-span pre-cast superstructure, the largest of its kind at the time. The line from Dublin to Malahide was electrified in 1999 and a suburban DART service commenced a year later to accommodate the rapidly expanding town. Since 1961, its population has grown from 2,534 to 15,846. The settlement has grown in all directions through the construction of housing estates, allowing the historic town core to retain its nineteenth-century seaside resort character.

5.6.12 The Talbot connection with Malahide lasted for 791 years, coming to an end in 1976, when Rose Talbot, sister of the seventh Baron Talbot, sold Malahide Castle and its 109ha demesne to Dublin City Council. The castle is now open to the public and displays a fine collection of Irish antique furniture, while its extensive grounds are used for amenity and sporting purposes.

Donabate

5.6.13 The early history of Donabate is similar to that of Malahide, with evidence of prehistoric habitation and the subsequent arrival of the Vikings to utilise the trading and raiding opportunities afforded by the sheltered Malahide Estuary. The origin of the name Donabate is equally uncertain, derived either from *Dún a' Bháid* (fort of the ferry) or from *Domhnach Bheathach* (church of the beast).

5.6.14 Following the Anglo-Norman invasion, a series of tower houses were constructed to protect the Donabate Peninsula, including the 14th-century peel tower, Lanistown Castle, which is located on the present Newbridge House demesne. Also of Anglo-Norman origin is St Patrick's Church, built in the first half of the 13th century and incorporating the remains of a Norman keep. The church was rebuilt in 1775, and forms the focal point of The Square, the former heart of the original village of Donabate.

5.6.15 In 1804, St Patrick's Roman Catholic Church was built to the northwest of Donabate, and it was probably at this stage that the settlement began to shift and relocate around the new church. A school was established in the village in 1824. The arrival of the railway in 1844 resulted in further expansion and the town grew northwards to Ballisk, which with its thatched cottages became the residence of the poorer inhabitants of the town. In 1903, a new church was built in Donabate, also dedicated to St Patrick, and the old one was converted into a parish hall. The village remained a small settlement for more than a century, its population being just 734 persons occupying 150 houses in 1912. In recent years, the town's proximity to Dublin has resulted in considerable population growth, increasing from 1,868 in 1996 to 6,778 in 2012. Most of the housing development has taken place around the town core, allowing the heart of the settlement to retain some of its old world charm. The Square, the former town centre, has been designated an Architectural Conservation Area.

5.6.16 Donabate lies on the eastern extremity of the demesne of Newbridge House and incorporates one of the estate's former gate lodges and pedestrian access to the grounds. The estate came into being in 1736, when Dr Charles Cobbe, later Archbishop of Dublin, purchased the townlands of Donabate, Lanestown, Haggardstown and Newbridge. A year later he built Newbridge House, possibly designed by Richard Castle. The estate was extended in 1742 through the purchase of the townlands of Kilcrea, Corballis and Baltra, and the house enlarged to the rear in 1751 by the Archbishop's son, Colonel Thomas Cobbe. It remained the home of the Cobbe family until 1985, when it was acquired by Fingal County Council, with the family retaining the right to reside in the house from time to time. The building is open to the public, and its 150ha demesne, designated an Architectural Conservation Area, is in use for amenity purposes.

5.7 Discussion of Architectural Heritage

Introduction

5.7.1 A total of 65 sites of potential architectural heritage merit were identified within the study area (see Appendix D). These sites and structures can be broadly divided into four types according to their function as domestic, industrial, public or ecclesiastical (see Appendix J-Figures 3 and 4 and Appendix E).

Domestic Architecture

5.7.2 A total of 30 of the constraints identified in the study area fall into the category of domestic architecture. These include vernacular buildings, town houses, and country houses and their demesnes. Estate buildings (including outbuildings, gate lodges, entrance gates and avenue bridges) are also included in this category. Considering the relatively small size and urban nature of the study area, it contains an unusual concentration of vernacular houses (4) as well as country houses (5). It is also noteworthy that all vernacular buildings occur within the two urban settlements.

5.7.3 Of the 30 constraints in this category, 29 are considered key constraints. Four of these key constraints are considered to be of national importance: Malahide Castle (a multi-period structure ranging in date from the 13th to the early 19th century and considered to be the most distinguished of all Irish castles); Seafield House (a Palladian villa of c. 1750) and its outbuildings; and Newbridge House (attributed to Richard Castle, 1737).

5.7.4 Key constraints of regional importance, 23 in number, include the c. 109ha demesne, outbuildings, two gate lodges and a house associated with Malahide Castle; the Casino and three other vernacular buildings at Yellow Walls, Malahide and Beaverstown; Auburn House, outbuildings and demesne; the c. 162ha demesne, outbuildings and gate entrance associated with Newbridge House; three town houses in Malahide (Tír na nÓg, Sonas and Rosca) and one in Donabate (An Dun); The Cottage at The Square, Donabate; Prospect House at Prospect Hill, Donabate; Kilcrea House (c. 1800) and the demesne of Seafield House.

Industrial Architecture

5.7.5 A total of 17 of the constraints identified in the study area fall into the category of industrial architecture. These include mills, lime kilns, bridges, milestones and structures associated with the railway. Although Malahide has a well-documented history of industrial activity, much of it has made way to urban development and structures related

to the railway remain the most common type within this group. This reflects the notable change in Malahide from a commercial centre to a tourist resort and residential settlement in the course of the 19th century.

5.7.6 Of the 17 constraints in this category, 14 are considered key constraints. Of these, the Malahide and Donabate railway stations and associated signal boxes, station master's house, bridges, pedestrian gateway and viaduct constitute 10 constraints. The other four key constraints include a lime kiln within the Malahide Castle demesne; two bridges in the Newbridge House demesne; and the remains of a tidal mill at Kilcrea. All of these constraints are considered to be of regional importance except for the tidal mill at Kilcrea, which is considered to be of local importance.

Public Architecture

5.7.7 A total of seven of the constraints identified in the study area fall into the category of public architecture. Public architecture refers here to buildings providing services to the local population. Such buildings frequently serve an important community function, such as schools and community halls, and act as centres of social activity. These structures are frequently the only architecturally informed buildings in dispersed rural settlements, while in urban settings they can have important group value by enhancing streetscapes. Many, such as forges and creameries, are becoming increasingly scarce throughout Ireland.

5.7.8 Of the seven constraints in this category, all are considered to be key constraints. Of these, two are Architectural Conservation Areas. These include the historic core of Malahide and the former village centre (The Square) in Donabate, of which the latter with its individual buildings holds significant group value. The other five key constraints include Malahide School, a handsome red brick building dating from c. 1900; a water pump at The Square, Donabate; a vernacular house at Donabate incorporating a former forge, dating from c. 1850; Smyth's Pub in Donabate, constructed in 1842 and retaining a number of original interior features; and St. Patrick's Hall in Donabate, built in 1804 as a church and converted into a parish hall in 1903. All are considered to be of regional importance.

Ecclesiastical Architecture

5.7.9 A total of eleven of the constraints identified in the study area fall into the category of ecclesiastical architecture. This category comprises churches, chapels, graveyards and residences of the local clergy, whether manses, rectories or parochial houses. Relics and memorials have also been included in this category.

5.7.10 Churches form the core of almost every urban settlement and function as important focal points in dispersed rural settlements. They are often of considerable architectural merit and in many instances the only architecturally informed buildings in a particular area. Churches are often clustered with clerical residences, schools and/or community halls, and as such can have important group value even when the architectural merits of the individual buildings are modest. Owing to the sensitive nature of these sites and structures, all are considered to be key constraints.

5.7.11 Of the eleven key constraints in this category, two are considered to be of national importance. These are the church and graveyard of Malahide Abbey located adjacent to Malahide Castle, which date from the 13th century. The last burial in the graveyard took place in 1960 and certain families still retain burial rights to this site.

5.7.12 Eight of the remaining nine key constraints are considered to be of regional importance. These include Malahide Presbyterian Church designed by William Baird in 1956; Kilcrea Church and graveyard, possibly of medieval origin; St Patrick's Church of Ireland Church at The Square, Donabate (constructed in 1775 around a 13th-century core, which forms the focal point of the Architectural Conservation Area of The Square and has important group value with adjoining buildings) and associated graveyard; the former Vicarage at The Square, Donabate, dating from c. 1850; the late 19th-century Donabate Cemetery; and St Patrick's Church in Donabate, constructed in 1903 and containing a stained glass window by Harry Clarke.

5.7.13 The final key constraint, a wall monument dedicated to John Fitzsimon (d. 1709) inside St Patrick's Church of Ireland Church at The Square, Donabate, is considered to be of local importance.

5.8 Summary

5.8.1 Based on the assessment of the architectural heritage constraints within the study area, the following appraisal can be made:

5.8.2 Sites to be considered as key constraints:

- All sites listed as National Monuments.
- All sites listed in the Register of Historic Monuments.
- All sites subject to a Preservation Order (temporary or full).
- All sites listed in the Record of Protected Structures.
- All Architectural Conservation Areas.
- All sites in the ownership or guardianship of the Local Authority or of the Office of Public Works.
- All other sites so designated in the report.

Sites to be considered as constraints:

- All other sites, which are afforded statutory protection, should be considered as constraints.
- All unregistered architectural heritage sites should be considered as possible constraints.

6.0 Archaeology and Cultural Heritage

6.1 Introduction

6.1.1 This chapter assesses and evaluates the potential archaeological and cultural heritage constraints of the study area. Archaeology includes all pre-1700 sites and all levelled/buried features of any date. Cultural heritage includes history, landscape and garden design, folklore and tradition, geological features, language and dialect, religion, settlements, inland waterways (rivers) and place names. Architectural heritage is dealt with separately in Chapter 5.0.

Definitions

6.1.2 'Archaeological heritage' can be described as the study of past human societies through their material remains and artefactual assemblages. Our knowledge and understanding of past societies, with no written record, is enhanced by the study of archaeological remains.

6.1.3 The phrase 'cultural heritage' is a generic term that spans thousands of years and covers a multitude of cultural, archaeological and architectural sites and monuments within the landscape. EPA guidelines (2015) define cultural heritage as being tangible and intangible. Tangible cultural heritage includes; movable cultural heritage (artefacts), immovable cultural heritage (monuments, archaeological sites, and so on) and underwater cultural heritage (shipwrecks, underwater ruins and cities). Intangible cultural heritage encompasses oral traditions, folklore, history and language. Cultural heritage in this report includes history, landscape and garden design, folklore and tradition, geological features, language and dialect, religion, settlements, inland waterways (rivers) and place names.

6.2 Methodology

6.2.1 This report was compiled using the following documents:

- *Draft Guidelines on the information to be contained in Environmental Impact Assessment Reports (EIAR)* (Environmental Protection Agency, 2017).
- *Draft Advice Notes for preparing Environmental Impact Statements* (Environmental Protection Agency, 2015).
- *Framework and Principles for the Protection of the Archaeological Heritage* (Department of Arts, Heritage, Gaeltacht & the Islands, 1999).
- *Policy and Guidelines on Archaeological Excavation* (Department of Arts, Heritage, Gaeltacht & the Islands, 1999).
- *Guidelines for the Assessment of Archaeological Heritage Impacts of National Road Schemes* (TII (formerly NRA), 2005). (Although the proposed project is not a road it is a linear corridor extending continuously across the landscape and thus these guidelines were considered appropriate).

6.2.2 In compiling the desktop study the following sources were used:

- *Database of Irish Excavation Reports (www.excavations.ie)*: This website provides a database of summary reports of all archaeological excavations and investigations in Ireland undertaken from 1970. The database was searched for any excavations that were undertaken in any of the townlands in the study area (see Appendix F).

- *Cartographic Sources*: The various editions of the Ordnance Survey six-inch maps; first, second and third editions for Dublin were consulted.

- *Aerial Photographs*: Aerial photographs can be useful in obtaining information on levelled, unknown archaeological monuments or in detecting potential archaeological features that may only be identified from the air. The proposed greenway was examined on aerial photographs from the following sources:

  - National Monuments Database (*c.* 2013) www.archaeology.ie.
  - Ordnance Survey of Ireland website (1995, 2000 and 2005) www.osi.ie.
  - Google maps www.googlemaps.ie.
  - Aerial photographs provided by CHE.

- *Record of Monuments and Places (RMP)*: This record was established under Section 12 (1) of the National Monuments (Amendment) Act 1994. It provides a list of all known archaeological monuments and places of archaeological interest, with an accompanying set of constraint maps. Its numbering system consists of two parts: the first part is the county code (DU for Dublin) followed by the Ordnance Survey (OS) map number six-inch to the mile scale, which was further reduced to 1:12,500 to accommodate the RMP; the second part is the number which refers to the specific archaeological site, e.g. DU12-30 refers to circle 30 on OS sheet 12 for Dublin. This number is generally placed beside a circle which surrounds the archaeological site. The area within the circle is referred to as the Zone of Archaeological Notification for that site. The RMP for County Dublin was published in 1998. It is an offence to interfere with any of the sites or monuments listed in the RMP without first giving two months' notice in writing to the National Monuments Service (NMS) at the Department of Culture, Heritage and the Gaeltacht (DCHG).

- *Sites and Monuments Database of the Archaeological Survey of Ireland*: The purpose of the Archaeological Survey of Ireland (ASI) is to compile a base-line inventory of the known archaeological monuments in the State. The large archive and databases resulting from the survey is being continually updated. This database, complete with maps is now available for consultation via the NMS website at www.archaeology.ie. The database also provides lists of national monuments that are in the ownership or guardianship of the State.

6.2.3 *National Monuments* – Section 8 of the National Monuments (Amendment) Act 1954 provides for the publication of a list of monuments, the preservation of which is deemed to be of national importance. Ministerial consent must be granted before any works are carried out with respect to a national monument.

- *Files of the National Monuments Service*: Some recorded archaeological sites have been afforded added protection under the following legislation (national monuments are mentioned above)

- *Monuments subject to Preservation Orders and Temporary Preservation Orders*: The National Monuments Act 1930 provides for the making of preservation orders to protect national monuments that are considered to be under threat. The prior written consent of the Minister is required for any works at or in proximity to the monument.
- *Register of Historic Monuments*: Under Section 5 of the National Monuments (Amendment) Act 1987, two months' notice must be given in writing to the Minister in advance of any proposal to carry out work in relation to a historic monument or archaeological area entered on the Register.

- *Fingal Development Plan 2017-2023*: The development plan outlines the local authority's objectives with regard to the preservation of the archaeological (and architectural) heritage of the county. It provides the following information; national monuments in Fingal in state care or subject to preservation orders. While the Record of Monuments and Places is not included in the Development Plan icons showing the location of RMP sites are shown on the maps which accompany the plan.

6.3 Assessment of Constraints

Perceived Importance of Sites

6.3.1 For the purpose of this report an assessment is given of the perceived (not necessarily definitive) importance of the various cultural heritage sites within the study area. The assessment of perceived importance is based on professional judgement of the information to hand, framed within the confines of the study. On a site-by-site basis, the levels of perceived cultural heritage importance are liable to future revision where new information is brought to light, either through more detailed investigations, surveys or research. The classification of levels of perceived importance is therefore based on an appraisal of current information and an assessment of importance probability.

6.3.2 All recorded archaeological sites are afforded the same protection under National Monuments legislation. An assessment is made of the perceived (not necessarily definitive) relative importance of the various sites of archaeological heritage. The majority of cultural heritage sites by their nature are not protected and this is particularly the case if the sites are non-specific. In the case of sites such as buildings etc, which may be of cultural heritage as well as architectural heritage value they may be afforded protection under the Planning and Development Act 2000.

(a) *International Importance*: A site is deemed to be of international importance where, its known importance is perceived by the study to merit international recognition as a site of exemplary importance. There are no sites considered to be of international importance within the study area.

(b) *National Importance*: A site is deemed to be of national importance where, its known importance is perceived by the study to merit national recognition as a site of considerable importance. There are no sites considered to be of national importance within the study area.

(c) *Regional Importance*: A site is deemed to be of regional importance where its known importance is perceived by the study to merit regional recognition as a site of high importance. Examples of site types within the study area include castles and churches and graveyards. There are three archaeological sites considered to be of regional importance within the study area.

(d) *Local Importance*: A site is deemed to be of local importance where its known importance is perceived by the study to merit local recognition as a site of notable importance. Examples of site types within the study area include holy wells and enclosures. There are two archaeological sites considered to be of local importance within the study area. There are also two cultural heritage sites considered to be of local importance within the study area.

6.4 The Receiving Environment

6.4.1 This chapter provides a broad chronological overview of the landscape of the proposed greenway. Appendix F (Table 1) gives details of all archaeological sites referred to in the constraint report (see also Appendix J-Figures 5 and 6). The chronological overview provided here relates specifically to the study area. It is based mainly on information from the Sites and Monuments Database of the Archaeological Survey of Ireland.

Archaeological Heritage

6.4.2 There are four known, recorded prehistoric sites within the study area at Beaverstown (DU012-066 and DU012-067), Kilcrea (DU012-072) and Newbridge Demesne (DU012-074). In 2002 early prehistoric activity was identified in Beaverstown. A stone axehead and flint flakes were revealed as well as several prehistoric features such as pits which produced cremated bone and possible prehistoric pottery (Hagen, www.excavations.ie). In 2003 a flint blade was recovered during further works (*ibid*.) and also in 2003 an area of Neolithic and Bronze Age activity was excavated comprising a number of pits and post-holes and contemporary pottery and flint was revealed in this area (*ibid*.). Evidence of further possible prehistoric activity may still remain undetected within the landscape or may have been destroyed by later activity. The curvilinear ditch (L. 15m; Wth. 1.3m; D. 0.7m) of an enclosure (DU012-067) was also excavated at the site and produced Beaker pottery. Within the enclosure a pit (0.4m in diameter) contained a small amount of burnt bone (www.archaeology.ie after Hagan 2006). Two ring ditches were identified in Kilcrea (DU012-072) and in Newbridge Demesne (DU012-074). Ring ditches, usually less than 10m in diameter may represent the remains of ploughed out barrows. Barrows are ritual/funerary monuments that are part of the Bronze/Iron Age burial tradition (c. 2400 BC - AD 400). Both sites were visible as crop marks on aerial photographs within low-lying land. No visible remains of these sites are evident (www.archaeology.ie).

6.4.3 The early medieval period in Ireland (c. 500 to 1000AD) is characterised by the introduction of Christianity to the island from the late fourth century onwards, becoming widely established during the second half of the sixth century. One of the most characteristic monuments of this period was the ringfort, occupied by the elite and their families of the time. Ringforts are defended farmsteads generally circular or oval in plan defined by an earthen bank with an external ditch or fosse. The main phase of construction and occupation of these sites dates from the beginning of the seventh century AD to the end of the ninth century. Possible levelled ringforts which may be represented on cartographic sources, as low-level earthworks, or on aerial photographs, are generally loosely defined as enclosures in the absence of further excavation. There are no ringforts within the study area but the enclosures in Kilcrea (DU012-017) and Lanestown (DU012-006), noted on aerial photographs, may represent the levelled remains of ringforts. The enclosure in Kilcrea is approximately 30m in diameter with an irregular annex attached and the second, c. 450m to the northwest in Lanestown consists of a single-ditch levelled enclosure, c. 50m in diameter. Two earthworks in Malahide Demesne (DU012-029) and in Malahide (DU012-023003) are no longer extant

but may have once been ringforts. It is possible that the one in Malahide Demesne may have been a barrow (described as a raised platform with an outer ditch, bank and second ditch) dating to the Bronze Age.

6.4.4 There is a levelled earthwork in Corballis (DU012-019) which was described as 'site of moat' on the 1837 first edition Ordnance Survey six-inch map. No visible trace of the monument now survives. Moated sites, rectangular in shape, are similar in function to ringforts although they are associated with the Anglo-Norman colonisation of the country in the medieval period (1100AD to 1600) when they functioned as contemporary farmsteads. They usually consist of square, rectangular, trapezoidal or occasionally circular enclosures. The interior is often raised and enclosed by one or more earthen banks with a wide, often water-filled, fosse and causewayed entrance. There is one motte in the study area, in Ballymadrough (DU012-014), comprising of an oval shaped mound with steeply sloping sides. It is located in a prominent position within the grounds of Seafield House.

6.4.5 Malahide Castle and Demesne has been associated with the Talbot family since the late 12th century. Nothing remains of the structures built here at that time but the core of the late medieval castle (DU012-030) is masked within the existing building, much of which was rebuilt in 1760. There are two ruined churches dating to the late medieval period in the study area. Churches of the simple style of these two may date to the late medieval period. The church at Kilcrea (DU12-016001) is a plain rectangular building of conglomerate and limestone with the east gable and side walls still standing. In the east gable and the south wall, at the eastern end, there is a splayed, single light window. A door rebate survives in the entrance in the south wall. The graveyard (DU012-016002) has been recently walled and is overgrown and no longer in use. A 15th century ruined church (DU012-031001) and graveyard (DU012-031006) stand in Malahide Demesne a short distance to the east of the castle (DU012-030). There are two sheela-na-gigs in this church (DU012-031002 and 031003). Sheela-na-gigs are figurative carvings of females displaying their genitalia usually dating to between the 15th and 17th centuries. There was a church recorded in Donabate in the 17th century and all that remains today is an early medieval doorway in the south porch.

6.4.6 Lainstown Castle at Newbridge Demesne (DU012-004) is a three storey tower house with stepped battlements marked by a cornice and a projecting angle tower in the southwest. There is a barrel vault at ground floor level and a spiral staircase provides overhead access to chambers with corbelled roofs. Similarly, the castle at Donabate (DU12-05002) is also a three-storey tower house and in this case it is attached to the eastern end of the 18th century St Patrick's Church of Ireland church (DU012-05001) which is on the site of the medieval parish church of Donabate. The tower house has a stepped battlement at parapet level with the cap house, containing the stairs projecting above the battlement level. A carved head projects from the eastern wall at second floor level. Donabate graveyard (DU12-05003) is a roughly square walled graveyard which contains the aforementioned church and tower house. The graveyard is raised above the adjoining ground and is still in use. It contains eighteenth and nineteenth century memorials. An excavation carried out in advance of road widening at Turvey Avenue in 2008 uncovered a linear ditch (CU012-082001) which contained animal bone of early medieval date and two adjacent structures (DU012-082002 and 003), situated at the edge of the ditch. The structures were associated with north-south drainage ditches from which a lot of 12th to 14th century pottery was recovered.

6.4.7 A third structure (DU012-082004), defined by an L-shaped dry stone wall (4.7m E-W x 2.7m N-S) overlay the backfilled early medieval ditch and was associated with a rubbish pit which revealed a silver farthing from the reign of Edward III (AD 1335-43) (www.archaeology.ie, after Kavanagh 2011, 14).

6.4.8 Kilcrea tidal mill (DU012-018) is an unclassified mill dating to the post medieval/early modern period (c. 1600 to the present). A tidal mill was marked on Rocque's map of County Dublin (1756) in the vicinity of the 'highest point to which medium tides flow' as shown on the 1937 OS 6" map at a point along a millrace east of Kilcrea House. There is some stone collapse at this location. The land immediately to its north was reclaimed during the late 19th or early 20th century.

6.4.9 St Sylvesters Well or Sunday's Well (DU012-023001), in the village of Malahide, probably dates to the post medieval period also but it may indicate earlier activity in the area. Its pattern day is 15th August.

6.4.10 There are two country houses with attendant demesnes within the study area, Malahide Castle (DU012-030) at the southern end of the route and Newbridge House (DU012-060) at the northern end. These form important elements of the cultural heritage of the area. Malahide Castle and Demesne, associated with the Talbot family for nearly 800 years, are publicly accessible. A botanic garden was developed within the demesne in the twentieth century by Milo Talbot incorporating many southern hemisphere plants. Many aspects of the demesne are still extant. The village of Malahide grew with and around the castle, although there are some references to a Viking settlement here. By the early 19th century, the village had a population of over 1,000, and a number of local industries, including salt harvesting, while the harbour continued in commercial operation, with landings of coal and construction materials. The area grew in popularity in Georgian times as a seaside resort for wealthy Dublin city dwellers.

6.4.11 Newbridge Demesne is a largely eighteenth century landscape which is also publicly accessible and incorporates a working farm. It is associated with the Cobbe family who retain an interest in the property still. A survey dated 1705 shows a schematic drawing of a large single storey house which is rectangular in plan with a pitched roof. The single storey house may have been incorporated into the present building on this site.

Cartographic Information

6.4.12 An examination of cartographic sources from the mid-19th century shows the main focus of the village of Malahide to be around the t-shaped meeting of New Street and The Mall, known as 'The Diamond' with all the usual services such as a school, post office, police station, etc present. Malahide Castle and Demesne lie to the southeast and the estuary to the north. The railway line is under construction. On the north side of the estuary, most of Kilcrea townland comprises a small peninsula jutting into the Malahide Estuary. There is a small island, named Mullan, c. 350m to the north of the northern edge of the peninsula. Kilcrea House is named and depicted along with a number of associated outbuildings at the landward (northwestern) end of the peninsula. A road/track runs east from Kilcrea House to Baltray Corn Mill (in ruins) which is named and depicted on the northern side of the peninsula. What appears to be a trackway extends north across the estuary to the island of Mullan from the mill. To the west of Kilcrea House a road runs north towards Donabate and south towards the estuary. A small roadside complex of three unnamed buildings is shown on the eastern side of this road to the south of Kilcrea House. The church and graveyard at Kilcrea are named

and depicted on the western side of the road across the road from Kilcrea House. The construction of the Dublin Drogheda Railway embankment has commenced at the eastern end of the peninsula extending inland from its northern shore. Otherwise the peninsula is laid out in regular fields, those at the northern end of the peninsula are notably larger than those at the southern end. Newbridge House and Demesne lie to the northwest and the village of Donabate lies outside the northeastern edge of the demesne. It is divided by the railway line with the western half centred around a triangle of roads whilst the eastern half contains the church and graveyard.

6.4.13 When the 25-inch map of 1888-1913 was compiled very little had changed in Donabate but Malahide had begun to expand in all directions. On the north side of the estuary a number of significant changes had taken place. The land to the north of the Kilcrea peninsula had been reclaimed subsuming the island of Mullan. The construction of the Dublin-Drogheda Railway, now called the Great Northern Railway (Ireland), appears to have facilitated this as it defines the eastern extent of the reclamation. Kilcrea House is again named and depicted as is the church, now described as 'in ruins', and the graveyard, now described as 'disused'. The unnamed complex of buildings to the south of Kilcrea House is again depicted and unnamed. Baltray Corn Mill is no longer named or depicted. The road which extended along the northern end of the peninsula to the east of the mill now extends further east to the railway embankment and north of it lies the reclaimed land. A water channel extending through this land is named the Mullan Intake. The reclaimed land is laid out in fairly regular large fields and some consolidation of field boundaries on the peninsula is evident with larger fields now present. Modern OS maps and aerial photographs show the former peninsula and the reclaimed land still largely under agricultural use. Fields have become larger again, particularly on the former peninsula. Some limited development has occurred generally at the western end of the former peninsula and at the landward edges of the reclaimed area but the areas appears to have remained largely rural in nature.

Cultural Heritage Sites (CHS)

6.4.14 Four CHS were identified in the constraints study as follows:

6.4.15 The railway line (CHS1), initially known as the Dublin Drogheda Railway, then the Great Northern Railway (Ireland) and currently, better known as the Dublin Belfast Railway. Construction of the railway commenced in 1840, under the stewardship of Sir John Benjamin MacNiell, and the Dublin to Drogheda line was officially opened in 1844 making travelling in both directions simpler and quicker. This was the third railway line to be constructed in Ireland, following the Dublin-Kingstown and Belfast Lisburn lines. It had a 5ft 2in gauge and the Ulster Railway had a 6ft 2in gauge. According to one legend, the engineers of the Ulster Railway and those of the Dublin and Drogheda line deliberately planned the tracks on different gauges, so that if two lines ever met, neither company could use the rolling-stock of the other. The railway line overtook the importance of the sea and the commercial use of the Malahide Estuary for export and import. The subsequent extension and connection of the line northbound later in the 19th century further facilitated northbound travel and transport. The railway line has, over the last century and a half, become an integral part of the local landscape and now plays a major part in the commuter value of towns and villages in this area.

6.4.16 The Malahide Estuary (CHS 2) has played an important role in the life of generations of Malahide and Donabate people. In the post 1700 period a substantial fishing fleet operated out of the estuary providing an income for those living in and around there.

They fished for cod and ling in the Irish Sea but the estuary itself provided seaweed, mussels, cockles, winkles and oysters. The area was famous for its green-finned oysters and there was an oyster bed of c. 2ha in the area of the present viaduct. In 1885 a Major Hayes tried to re-start the oyster industry, but failed. The beds which were the property of the Talbots lasted until 1903. In its day the estuary was a rival to Dublin with its safe, sheltered position and sandy beach for unloading ships. Local goods exported included cod-liver oil while coal was imported for the manufacture of town gas in Malahide. With the coming of the railway in 1844 and the building of the viaduct, a large maritime lake was formed on the south side of the estuary, one mile wide and three miles long. Construction of the viaduct on the north side of the estuary saw its reclamation and the disappearance of the island of Mullan. The estuary was a busy area over the centuries with boats coming and going and invariably there were a number of tragedies with the ships going aground and being wrecked. The legacy of the more recent history of the estuary survives in the form of above ground features such as piers and quay walls while buried features could include shipwrecks, mills and fish traps.

6.4.17 While both Malahide Castle and Demesne (CHS 3) and Newbridge House and Demesne (CHS 4) are listed as sites of cultural heritage importance in this chapter, they are dealt with in greater detail in Chapter 5.0 (Architectural Heritage) of this report.

6.5 Summary

6.5.1 Based on the assessment of the archaeological and cultural heritage constraints within the study area, the following appraisal can be made:

6.5.2 Sites to be considered as key constraints:

- All sites listed as National Monuments.
- All sites listed in the Register of Historic Monuments.
- All sites subject to a Preservation Order (temporary or full).
- All sites listed in the Record of Protected Structures.

6.5.3 There are no archaeological sites within the study area which fall into the above categories. There are 16 sites considered to be of regional importance and the remainder are of local importance. There are four cultural heritage sites within the study area and the railway line is considered to be of regional importance. The other three are of local importance.

7.0 Land, Soils and Groundwater

7.1 Introduction

7.1.1 This chapter considers any potential geological and hydrogeological constraints of the study area.

7.2 Study Area

7.2.1 The study area is approximately 12km^2, incorporating the Malahide Demesne, Malahide Village, the railway causeway across Malahide Estuary, the townland of Kilcrea and the Newbridge Demesne (see Appendix J-Figure 1).

7.2.2 The proposed development crosses through a variety of geological environments. The age of the underlying Formations ranges from the Ordovician (c. 510 million years ago) to the Quaternary (c. 1.6 million years ago).

7.2.3 A study of the Ordnance Survey map of Ireland indicates that the area is low lying and coastal. The elevation is typically between 1m AOD and 10m AOD and the main geological features within the study area are small sporadic eskers, rising to a few meters in height.

7.2.4 A number of small streams drain towards the estuary. The modern coastline began to develop after the post glacial sea level stabilised more than 5,000 years ago. The modern beaches of Malahide and Donabate were formed and blown sands collected in the form of sand dunes.

7.3 Methodology and Sources of Information

7.3.1 The TII (formerly the NRA) *Guidelines for the Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes* have been referred to in the preparation of this report. In order to identify the constraints for the study area with the respect to the geology and hydrogeology a desk study has been completed using the following relevant information:

- *Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes* (TII (formerly NRA), 2009);
- *Draft Guidelines on the information to be contained in Environmental Impact Assessment Reports (EIAR)* (Environmental Protection Agency, 2017).
- *Draft Advice Notes for Preparing Environmental Impact Statements* (Environmental Protection Agency, 2015).
- Geology of Meath, Geological Survey of Ireland (GSI) (1999), Sheet 13;
- GSI Online Database – Generalised Bedrock Geology, Subsoil, Vulnerability and Aquifer maps;
- GSI well and geotechnical data.

7.4 Identified Constraints

7.4.1 A summary of the key geological and hydrogeological constraints identified are outlined in Table 7.1 below.

Table 7.1 Summary of Constraints.

Constraint Identified	Parameter Measured	Figure Ref.
Geology		
Solid Bedrock and Bedrock Outcrop	Extent of outcrop parallel to the proposed route ways.	Appendix J-Figure 7
Soils and Subsoils	Extent of peat deposits parallel to a proposed route or underlying the route.	Appendix J-Figure 8
Karst Potential	Extent of karstified bedrock parallel to or underlying the proposed route way.	
Active Quarries	Number of active quarries near the proposed route ways.	
Hydrogeology		
Extreme (E) and High (H) Groundwater Vulnerability Areas	Extent of E and H areas parallel to or underlying the proposed route way the proposed route.	Appendix J-Figure 9
Third Party Wells (0-50m accuracy)	Number of mapped third party wells within pre-defined 50m distance from the proposed route.	
Karst Features	Number of mapped karst features within pre-defined 50m distance from the proposed route.	

7.4.2 The constraints of the railway causeway are not explored as this part of the route is located on a man-made structure. The proposed development will follow on the existing western embankment of the railway causeway across the Malahide Estuary.

Geological Constraints

Section 1 – Malahide Demesne

7.4.3 Solid Geology and Bedrock Outcrop: According to the Geological Survey of Ireland Bedrock Map Series, Sheet 13, the Malahide Formation (ML) underlies the northern area of the Malahide Demesne. This formation consists of the Malahide Formation (ML), which includes all strata between the top of the Donabate Formation (DE), and the base of the younger overlying Waulsortian Limestone. The formation consists of calcareous shales, siltstones and sandstones, and limestone. The southern part of Section 1 is underlain by the Tober Collen Formation (TC), which comprises dark grey, calcareous mudstones, that are commonly found to be bioturbated with subordinate micrites. Along the western boundary, a small area has been mapped as Waulsortian Limestones. This formation is described as being pale grey, poorly bedded, pure limestones with thin shale interbeds which are locally present.

7.4.4 Karst Potential: The northern area of the section is underlain by a Locally Important Aquifer that would be moderately productive in local zones (Ll). According to GSI mapping there is a small isolated spring located within Section 1 but the risk of karst development is considered to be low. The southern area of the site is underlain by a Poor Aquifer with bedrock which is generally unproductive except for Local Zones (Pl). Similarly to the aquifer identified in the northern area of Section 1, the risk of karst development is considered to be low.

7.4.5 Soils and Subsoils: Man-made ground has replaced the original soils within an area stretching from the northwestern boundary to the central area of this section, the Malahide Demesne. The soil underlying the central area of this section, has been

mapped as grey or brown podzolic/brown earth (BminDW). Along the southwestern, southern and eastern boundaries of the section, pockets of surface/groundwater gleys, which are deep poorly drained mineral soil derived from mainly calcareous (limestone) have been identified.

7.4.6 The majority of Section 1 has been mapped as limestone derived till (TLs). Man-made ground has replaced the original subsoil within an area stretching from the north western boundary to the central area of Section 1. Within this zone small areas of bedrock outcrop or subcrop near the surface have been mapped.

7.4.7 Active Quarries: There are no active quarries within this area and, based on the location, it is not expected that it will occur in the future.

Section 2 – Malahide-Dublin Road

7.4.8 Solid Geology and Bedrock Outcrop: The underlying bedrock geology of Section 2 consists of the Malahide Formation (as described in Section 1). Exposed rock near the surface has been identified in the eastern area of Section 2 at the railway line.

7.4.9 Karst Potential: The area is underlain by a Locally Important Aquifer that would be moderately productive in local zones (Ll). According to the GSI mapping there are no karst features in the area and the risk of karst development is considered to be low.

7.4.10 Soils and Subsoils: Man-made ground has replaced the majority of the original soils within an area stretching from the western boundary to the central area of this section, the Malahide-Dublin Road. The soil underlying the central area of this section, has been mapped as grey or brown podzolic/ brown earth (Bmin DW). Along the eastern area of the section, pockets of surface/groundwater gleys, which are deep poorly drained mineral soil derived from mainly calcareous (limestone) have been identified. The subsoil underlying Section 2 consists primarily of limestone derived till (TLs). However, the majority of soils underlying this area have been replaced by man-made ground. Small pockets of bedrock at the surface (Rck) has been identified along the railway line in the eastern area of Section 2.

7.4.11 Active Quarries: There are no active quarries within this area and, based on the location and the density of housing in the area, it is not expected that future quarrying will occur.

Section 3 – Malahide Village

7.4.12 Solid Geology and Bedrock Outcrop: The underlying bedrock of Section 3 consists of the Malahide Formation which is described above. No outcrops identified or mapped in the vicinity are found. Excavation required for the proposed extension of a car park would not result in the exposure of bedrock.

7.4.13 Karst Potential: The majority of the section is underlain by a Locally Important Aquifer, that would be moderately productive in local zones (Ll). According to GSI mapping there are no karst features in the area and the risk of karst development is considered to be low.

7.4.14 Soils and Subsoils: The eastern part of Section 3 comprises surface/ groundwater gleys, which are deep poorly drained mineral soil derived from mainly calcareous (limestone) parent materials (BminPD). Small pockets of grey or brown podzolic/brown earth (Bmin DW) occur near the southwestern boundary of this section. The subsoil underlying Section 3 consists primarily of limestone derived till (TLs). However, the majority of soils

underlying this area have been replaced by manmade ground. Alluvium material is identified west of the Section 3 area near the Yellow Walls area of Malahide.

7.4.15 Active Quarries: There are no active quarries within this area and, based on the location and the density of housing in the area, it is not expected that future quarrying will occur.

Section 5 – Kilcrea Townland

7.4.16 Solid Geology and Bedrock Outcrop: According to the Bedrock Map Sheet 13, the Malahide Formation underlies the southern parts of the townland. Both the Malahide Formation and the Donabate Formation underlie the middle and eastern parts. The Donabate Formation (DE) consists of red coarse lithic-sandstones and quartz-pebble conglomerate. No bedrock outcrops have been identified at the surface and according to the GSI Vulnerability map, the bedrock is between 3-10m below ground surface. It is not considered that the construction of Section 5 will require extensive excavation to the bedrock.

7.4.17 Soil and Subsoil: The soils of Section 5 are dominated by BminDW with zones of BminPW with marine or estuarine sediments (MarSands). Subsoils along the southern estuary boundary comprise beach sands (Mbs). Similar to Section 2, limestone derived tills (TLs) dominate the section, with small zones of sandstone derived tills (TDSs), alluvium (A) and estuarine sediments (Mesc).

7.4.18 Karst Potential: The majority of the section is underlain by a Locally Important Aquifer that would be moderately productive in local zones (Ll). According to GSI mapping there are no karst features in the area and the risk of karst development is considered to be low. The northern part of Section 5 is underlain by a Locally important Aquifer which is generally moderately productive (Lm). This bedrock comprises sandstone and conglomerate and is therefore not subject to karstification.

7.4.19 Active Quarries: There are no active quarries within in the area of Section 5. Considering the proximity of the Malahide Estuary which has been designated as a Special Area of Conservation (SAC), a Special Protection Area (SPA) and a Ramsar site (wetland of international importance) under the Ramsar Convention on Wetlands, it would not be envisaged that future quarrying developments will occur.

Section 6 – Newbridge Demesne

7.4.20 Solid Geology and Bed Outcrop: The underlying bedrock geology of Section 6 comprises the Malahide Formation and the Donabate Formation, both of which have been describe above. The bedrock is not exposed in this area. The bedrock lies approximately 3-10m below the surface.

7.4.21 Soils and Subsoils: The soils of the section are dominated by BminDW and BminPD with zones of mineral alluvium comprising marine and estuarine sediments. The subsoils of the section are dominated by TLs with elongated zones of alluvium (A).

7.4.22 Karst Potential: The majority of the section is underlain by a Locally Important Aquifer with bedrock that is generally moderately productive in local zones (Ll). According to the GSI Public Viewer, there are no karst features identified and the potential for karstification is considered to be low.

7.4.23 Active Quarries: There are no active quarries within this area and, based on the location, it is not expected that it will occur in the future.

Hydrogeology

Section 1 – Malahide Demesne

7.4.24 Extreme (E) and High (H) Vulnerability Areas: Groundwater vulnerability within this section is dominated by High (H) to Extreme (E) vulnerability.

7.4.25 Third Party Wells (0-50m accuracy): Using the GSI Online Well Database, one third party well has been within the Malahide Castle Demesne. This is an ancient well, it is sourced from a spring but it is not used as a drinking water source.

7.4.26 Karst Features: There is one spring identified on the site; this spring has been mapped as a well on the GSI Online Well Database.

Section 2 – Malahide-Dublin Road

7.4.27 Extreme (E) and High (H) Vulnerability Areas: Groundwater vulnerability within this section is dominated by High (H) to Extreme (E) vulnerability.

7.4.28 Third Party Wells (0-50m accuracy): Using the GSI Online Well Database, no third party wells (0-50m accuracy) have been identified within 50m of the route alignments from this section.

7.4.29 Karst Features: Using the GSI online Karst Features Map, no karst features have been identified within this section.

Section 3 – Malahide Village

7.4.30 Extreme (E) and High (H) Vulnerability Areas: Groundwater vulnerability within this section is dominated by High (H) to Extreme (E) vulnerability.

7.4.31 Third Party Wells (0-50m accuracy): Using the GSI Online Well Database, no third party wells (0-50m accuracy) have been identified within 50m of the route alignments for this section.

7.4.32 Karst Features: Using the GSI Online Karst Features, no karst features have been identified within this section.

Section 5 – Kilcrea Townland

7.4.33 Extreme (E) and High (H) Vulnerability Areas: This section largely encompasses a Low (L) vulnerability groundwater area.

7.4.34 Third Party Wells (0-50m accuracy): Using the GSI Online Database – Generalised Bedrock Geology, Subsoil, Vulnerability and Aquifer maps, no third party wells (0-50m accuracy) have been identified along this section.

7.4.35 Karst Features: Using the GSI Online Karst Database, no karst features have been identified within this section.

Section 6 – Newbridge Demesne

7.4.36 Extreme (E) and High (H) Vulnerability Areas: This section has been defined as Low (L) groundwater vulnerability. Groundwater would not be considered at risk in low vulnerability areas.

7.4.37 Third Party Wells (0-50m accuracy): Using the GSI Online Database – Generalised Bedrock Geology, Subsoil, Vulnerability and Aquifer maps, no third party wells (0-50m accuracy) have been identified along within this section.

7.4.38 Karst Features: Using the GSI Online Karst Database, no karst features have been identified within this section.

7.5 Overview of Constraints and Conclusions

7.5.1 It is considered that, based on the constraints study, there are no geological or hydrogeological constraints that are likely to cause significant impacts both during the construction and operational phases of the proposed development.

7.5.2 This is based on the following findings:

Geology

7.5.3 Alluvial deposits identified during the study are overlain by existing route ways.

7.5.4 No new outcrops were identified during the study.

7.5.5 There are no active quarries within the vicinity of route ways and it is not expected that future quarrying development will occur.

7.5.6 There is potential for karstification to occur but this does not pose a significant threat based on the nature of the bedrock formation within the study area, the potential impact for karst development is therefore considered to be low.

Hydrogeology

7.5.7 The majority of the study area is characterised as Low (L) groundwater vulnerability with local zones of High to Extreme vulnerability. Construction relating to the proposed development has not been proposed in areas of High and Extreme groundwater vulnerability. Therefore, it is not considered to pose any risk to groundwater vulnerability.

7.5.8 One third party well has been identified within the study area in Malahide Demesne.

7.5.9 One spring has been identified within the study area in Malahide Demesne.

8.0 Surface Water

8.1 Introduction

8.1.1 This chapter considers the water quality, aquatic ecology and fisheries constraints of open (free) waterbodies in the study area (see Appendix J-Figures 1 and 13).

8.2 Study Area

8.2.1 Malahide Estuary represents the single most significant open waterbody within the study area. The proposed development will cross this estuary on the western embankment of the railway causeway, facing the Broad Meadow River (inner estuary). The study area includes a narrow tidal inlet which is the combined lower 'estuary' of the Pill River in Kilcrea, which flows from the Newbridge Demesne direction and a small drain which flows more or less due west. This creek exits to the east into the outer Malahide Estuary under the railway embankment. There are no other material aquatic environments in the study area.

8.3 Baseline Studies

8.3.1 Extensive aquatic and ecological baseline studies have been conducted on the Malahide Estuary since 2009. This is as a result of the Irish Rail bridge collapse on the Malahide Causeway. These studies are ongoing in connection with Appropriate Assessment requirements for this project and will be reported upon more fully at NIS/EIAR stage.

8.4 Receiving Environment

Malahide Estuary

8.4.1 The outer and inner parts of Malahide Estuary form part of the Malahide Estuary SAC (Site Code 00205). The inner estuary is effectively permanent standing water whose level is determined by the height of the water flowing over the weir beneath the railway viaduct, which is the only point of connection between the inner and outer estuaries. The inner estuary receives freshwater drainage from the Ward and Broad Meadow Rivers which enter the estuary just north of Swords. Both rivers are classified in their lower reaches as being of poor status by the EPA. The inner estuary has been classified as eutrophic by the EPA, while the outer estuary is classified as potentially eutrophic. As of 2015 both the inner and outer estuaries are designated as 'Moderate Status' under the Water Framework Directive (WFD). The outer estuary comprises a large expanse of intertidal sand and mud flats (EU Annex I Habitat) with a fringing strip of intertidal rock habitat along the armouring of the railway embankment. Various parts of the outer estuary have saltmarsh habitats (Atlantic Saltmarsh Meadow and *Salicornia* flats) and locally dense Cordgrass (*Spartina*) swards. In addition there are small areas of *Zostera* (sea grass) toward the northern part also.

8.4.2 Despite the poor water quality in the Ward River and Broad Meadow rivers there is a salmon and seatrout run into the former and a seatrout run into the latter and trout are fished in the estuary. In addition surveys in 2008 and 2010 by Inland Fisheries Ireland in the inner estuary have shown that high numbers of a small number of fish occur there including: sand gobies (*Pomatoschistus minutus*), thick-lipped grey mullet (*Chelon labrosus*), flounder (*Platichthys flesus*) and spratt (*Sprattus sprattus*). Less abundant species include among others, eel, brown trout, roach, 3-spined stickleback and bass.

Estuarine Habitats near Kilcrea Townland

8.4.3 The northwest corner of the outer estuary is dominated by *Spartina* sward and mud in the intertidal. These habitats are mainly confined to the eastern side of the railway embankment where they are within the SAC and protected. They extend as a narrow tidal creek under the railway embankment (6m wide culvert) into the western side of the embankment, i.e. outside of the SAC. The dominant habitat here is soft intertidal mud with just a small clump of remnant *Spartina*. The channel at low tide is 45m at its widest but generally only 20-25m. The section with exposed mud at low tide extends 350-450m 'upstream' from the embankment culvert as two separate channels, one forming the lower 'estuarine' end of the Pill River flowing from the Newbridge Demesne stream from the northwest and the other from a small sluggish plant-choked drain flowing from the west.

8.4.4 Fish species which are likely to use the area include sand goby, juvenile flounder, sprat and thick-lipped mullet. The saltmarsh creek system, although not very extensive, probably affords some nursery habitat for mullet and bass juveniles and possibly common goby (*P. microps*) also. Invertebrates likely to be common in the habitats are brown shrimp (*Crangon crangon*) and shore crab (*Carcinus maenas*). Burrowing invertebrate infauna in the fringing muddy and sandy mud habitat would typically include polychaete worms *Hediste* sp., small polychaetes, oligochaetes, small crustaceans (*Corophium* sp.) and possibly bivalves such as *Macoma balthica* (tellin) and *Cerastoderma edule* (cockle). All of these communities are tolerant of variable salinity and fairly turbid waters.

Pill River - Newbridge Demesne Stream

8.4.5 The small stream flowing from the Newbridge Demesne (the Pill River) drains intensively farmed ground in an area of low gradient and for these reasons is likely to have a moderate or slow flow with a paucity of suitable salmonid habitats. It may contain trout but is more likely to have eel, stickleback and in its lower reaches juvenile flounder and common goby also. Water quality is likely to be moderate or poor.

8.5 Summary

8.5.1 The key potential constraints from a water quality, aquatic ecology and fisheries perspective include:

- The Malahide Estuary SAC/pNHA/SPA.
- The "estuary" of the River Pill.

9.0 Material Assets – Agronomy

9.1 Introduction

9.1.1 This chapter considers agricultural constraints within the study area. The area south of Malahide Estuary is non-agricultural. Consequently, any potential agricultural constraints lie in the townland of Kilcrea. See Appendix J-Figure 10 for soil types, Appendix J-Figure 11 for farm boundaries, and Appendix J-Figure 12 for farm enterprise types and farm types.

9.2 Methodology

9.2.1 While there are no specific guidelines for preparing agronomy constraints reports, the *Draft Guidelines on the information to be contained in Environmental Impact Assessment Reports (EIAR)* (EPA, 2017) was utilised. This agronomy constraints assessment comprises of a desk-top collation and interpretation of available published data, and also includes a windshield assessment of the agricultural zone in the study area. The purpose of the desktop assessment was to identify:

- Areas within the study area which would have high concentrations of dairy farms or equine farms.
- Areas with high quality soils.
- Identification of farm yards.

9.2.2 The desk top study primarily referred to the following sources of information:

- 2010 Census of Agriculture (in 2017 this is the most up-to-date data for farm enterprise types on a per county basis).
- EPA Soil Mapping Data. This information is derived from a combination of aerial photography and on site surveying carried out in recent years by the Teagasc Spatial Unit in collaboration with the Geological Survey of Ireland, the Forestry Service and the EPA. As soil quality and type varies within a very small area the information is indicative only. Reference is also made to the An Foras Talúntais 1980 Soils Map of Ireland and the broad descriptions contained within the map.
- Aerial photography was used to identify forestry, scrub and rough boggy land.
- Land registry mapping was examined.

9.2.3 Windshield surveys were conducted in June 2012, February 2015 and October 2017. The purpose of the windshield survey was to verify if possible the desktop assessment data and identify the following:

- Farm yards;
- Farm yards and fields with dairy cows;
- Farm yards and fields with horses, equine training facilities and stables;
- Land cropping;
- Land quality.

9.3 Description of Agriculture

Statistical Analysis[1]

9.3.1 There are approximately 800 farmers and 38,000 hectares of agricultural land in County Dublin. The average size of farms is approximately 47.6 hectares, which was somewhat larger than the national average of 32.7 hectares. In County Dublin 47% of the area is sown to crops compared to the national average of 8% and 17% is sown to field crops in Dublin compared to the national average of 2%. The standardised economic output per farm in County Dublin is €100,000 compared to €31,000 for the State. Approximately 4% of County Dublin farmers are specialist dairy compared to the national average of 11%. County Dublin has the second highest area (next to County Meath) sown to potatoes and horticultural crops and north County Dublin in particular is noted for potato and horticultural cropping.

9.3.2 Within the study area of Kilcrea, twelve land registry land parcels were identified which could be potentially affected (see Appendix J-Figure 11). The following farm enterprises were noted during the field survey:

- One land parcel was noted which was predominantly vegetables (No. 5).
- One land parcel was noted which was a mixed tillage and grassland farm (No. 7) with horses and sheep. This farm had a horse training track on it.
- Four land parcels were noted which were predominantly grassland for cattle and hay/silage (No. 2, 3, 4 and 6). Land parcel No. 6 was grazed by dairy drystock (replacement dairy heifers)
- Two land parcels were noted which were natural grassland and amenity (No. 1 and No. 8). Land Parcel No. 1 is a public park with meadows, amenity areas and deciduous woodland.
- An equestrian centre was noted (No. 9). This land parcel is also cropped with potatoes and wheat.

Soils in the Study Area

9.3.3 This review of soils along the proposed greenway refers to EPA data sets and the field survey (see Appendix J-Figure 10). The area along the proposed development is generally flat and low lying. The main soil types are as follows:

- Deep well drained mineral soil derived from limestone parent material. This soil type is suitable for a range of tillage cropping and grassland. This is the predominant soil type in this area and it is represented by the EPA Code No. 12.
- Along watercourses and streams alluvial deposits are found. This is represented by the EPA Code No. 51. This soil is mainly suited for grassland.
- Associated with soil type 12 is a gley type soil described as a deep poorly drained mineral soil derived from limestone parent material. This soil type can be suitable

[1] Tables 1, 2, 5, 7A and 7D of the 2010 CSO Agricultural Statistics.

for a wide range of tillage crops where drainage is successful but is mainly suited for grassland.

- Along the southern part of the townland there are beach sands, gravels and marine sediments. The beach sands and gravels adjoin the estuary and are generally not used for agriculture. The sediments are suited for grassland.

9.3.4 In general all the land in the townland of Kilcrea is high quality land.

Farm Yard

9.3.5 Four farm yards were noted in the general area; one of which could be potentially affected (see Appendix J-Figure 12).

9.4 Summary

9.4.1 The main agricultural constraints are identified as:

- Sensitive farm enterprises (equine).
- High quality agricultural land.
- Farm yards.

Sensitive Farm Enterprises (Dairy and Equine)

9.4.2 The grassland and tillage farm enterprises in the area are not highly sensitive to disturbance. There are sensitive equine enterprises in Kilcrea. The equine enterprises should be avoided.

High Quality Agricultural Land

9.4.3 All of the land in the area is of high quality. Therefore, high quality agricultural land cannot be avoided

Farm Yards

9.4.4 There are a number of farm yards in the townland. Impacts on these should be avoided.

10.0 Biodiversity

10.1 Introduction

10.1.1 This chapter considers sensitive ecological habitats, flora and fauna in the study area. The objective of this chapter is to highlight areas of ecological sensitivity that should be avoided by the proposed scheme. This report follows the *Guidelines for Assessment of Ecological Impacts of National Road Schemes* (TII (formerly the NRA), 2009).

10.2 Methodology

10.2.1 The site was evaluated according to the methodology outlined by TII (formerly the NRA) 2006 (see Table 10.1 below). The ecological value of the site was assessed for the most part as (Low Value, Locally Important, i.e. comprised principally of artificial or highly modified habitats with low species diversity and low wildlife value. Areas of habitat within a designated European site, Malahide Estuary SAC, are evaluated as of international importance (see Appendix J-Figure 13 and Appendix G). Some smaller areas of habitat are defined as High Value and Moderate Value, Locally Important, i.e. areas of the site containing some natural or semi-natural habitat in the study area.

Table 10.1 Site Evaluation Scheme (TII (formerly NRA), 2006).

Rating	Qualifying criteria
A	**Internationally Important**: Sites designated (or qualifying for designation) as an SAC* or SPA* under the EU Habitats or Habitat and flora Directives. Undesignated sites containing good examples of Annex I priority habitats under the EU Habitats Directive.
B	**Nationally Important**: Sites or waters designated or proposed as an NHA* or Statutory Nature Reserve. Undesignated sites containing good examples of Annex I habitats (under EU Habitats Directive). Undesignated sites containing significant numbers of resident or regularly occurring assemblages of Annex II species under the EU Habitats Directive or Annex I species under the EU Habitat and flora Directive or species protected under the Wildlife (Amendment) Act 2000.
C	**High Value, Locally Important**: Sites containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or significant assemblages of locally rare species. Sites containing any resident or regularly occurring assemblages of Annex II species under the EU Habitats Directive or Annex I species under the EU Habitat and flora Directive.
D	**Moderate Value, Locally Important**: Sites containing some semi-natural habitat or locally important for wildlife.
E	**Low Value, Locally Important**: Artificial or highly modified habitats with low species diversity and low wildlife value.

*SAC = Special Area of Conservation; SPA = Special Protection Area; NHA = Natural Heritage Area.

10.2.2 The site was divided into six areas for evaluation purposes:

- Section 1 – Malahide Demesne.
- Sections 2 & 3 – Malahide Road and Village.
- Section 4 – Railway Causeway.
- Section 5 – Kilcrea Townland.
- Section 6 – Newbridge Demesne.

10.3 Section 1 – Malahide Demesne

10.3.1 To the south of the causeway the area is principally dominated by built land and is of very low habitat value. Only a few areas of modified semi-natural habitat occur; these are amenity grassland and treelines. These are of low and moderate local value respectively. The demesne does not lie within or directly adjacent to any Natura 2000 site. Similarly, no parts of the grounds are within any designated Natural Heritage Area (NHA). However, the local importance of the site is recognised in the Fingal Biodiversity Action Plan (2010-2015) as a Nature Development Area – a site with the potential through management to become a biodiversity focal point.

10.3.2 The routes as proposed for the demesne area follow existing metalled trackways and therefore do not pose any constraints to development vis-à-vis habitat or flora.

Habitat Type	Conservation Value
Amenity Grassland GA2	Low Conservation Value
Treelines WL2	Moderate Conservation Value
Mixed Broadleaf Woodland	Moderate to High Conservation Value

10.3.3 A breeding bird survey carried out at Malahide Demesne in 2006 revealed a typical parkland bird assemblage (Merne & Roe, 2006). The mixture of open playing fields and areas of mature deciduous woodland accounting for relatively high numbers of species such as Woodpigeon (*Columba palumbus*), Corvids and woodland edge specialists like Blackbird (*Turdus merula*) and Robin (*Erithacus rubecula*). The grounds are enjoyed by good numbers of visitors throughout the year and while foot traffic is high, there is a good deal of vegetative cover for roosting and nesting birds. The open fields provide good feeding opportunities for a variety of bird species. A study of the mammals of Malahide Demesne was also carried out in 2006 (Keeley, 2006) and this found that the park supported a good range of terrestrial mammals. Four species of bat were detected but no active roost was located. An active Badger (*Meles meles*) sett was recorded and there were direct observations of Badgers feeding on the grounds. Due to the maturity of the grounds and their location alongside an urban centre the parklands are locally important of moderate to high value. There is a network of existing pathways within the park and these should be utilised or upgraded in preference to the creation of any new roads or paths to facilitate the inclusion of Malahide Demesne in any combined use greenway.

10.4 Sections 2 & 3 – Malahide Road and Village

10.4.1 In common with any urban area, there are significant attractions for feeding and roosting fauna of a range of species. The importance of urban gardens to passerines is well recognised and buildings and gardens can provide shelter and feeding opportunities for a range of mammal species including Fox (*Vulpes vulpes*) and bats. The development of a combined use greenway from the Dublin Road to Bissets Strand has very little potential to cause any significant disturbance to birds and mammals in this area. Malahide is a busy urban area with all of the associated movements of vehicles and people. The proposed development would utilise existing infrastructure to develop a route to connect the demesne with the railway causeway. Routes accessing Bissets Strand west of the causeway would have some potential for disturbing birds within Malahide Estuary SPA (Site Code 004025). This would depend on the design of the walkway and the proximity to the shoreline. However, this area is already a popular area for walkers and recreational boating. The road along Bissets Strand which passes under the railway bridge is relatively

busy and there is a relatively high background level of disturbance in this area from traffic, pedestrians and their dogs, and private and municipal lighting.

10.5 Section 4 – Railway Causeway

10.5.1 Malahide Estuary is located on either side of the railway causeway and viaduct which divides the outer estuary from the inner estuary. It is the nearest Natura 2000 site to the proposed greenway and is covered by two conservation designations: Malahide Estuary SPA for the bird species it contains and Malahide Estuary SAC primarily for the habitats it contains (see Appendix G for site synopsis sheets). Malahide Estuary pNHA (Site Code 000205) also adjoins the causeway.

10.5.2 The annexed habitats of the estuary for which the Malahide Estuary SAC has been designated are:

- Fixed coastal dunes with herbaceous vegetation (grey dunes).
- Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes).
- Mudflats and sandflats not covered by seawater at low tide.
- *Salicornia* and other annuals colonising mud and sand.
- Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*).
- Mediterranean salt meadows (*Juncetalia maritimi*).
- *Spartina* swards (*Spartinion maritimae*).

10.5.3 The estuary is comprised of a mosaic of these habitats with the principal salt marsh and dune habitats confined to the outer Malahide Estuary.

10.5.4 The entire SAC is of high ecological value and is of international importance for the range of habitats it supports.

10.5.5 It must be noted that none of these habitats will be directly impacted by the development of the proposed development along the causeway.

10.5.6 The causeway itself does not support any habitat of intrinsic conservation interest. It is an artificial structure which may be described as fitting the category Sea Walls, Piers and Jetties CC1. This category is used for all coastal constructions that are subject to wetting by sea spray or wave splash. It includes sea walls, piers, jetties, slipways, causeways and other structures associated with ports and docks in urban or rural areas. In the littoral and sublittoral zones of sea walls, piers and jetties, the plant and animal communities that develop are similar to those of natural rocky substrata in the marine section of the classification. The causeway has been noted to support some species of local conservation interest.

10.5.7 Malahide Estuary is designated as part of the Malahide Estuary SPA under the Birds Directive (79/409/EEC) because of its importance for migratory wintering waterfowl. Malahide Estuary is a listed Ramsar Site (Site Code 833) and BirdLife International IBA (Site Code IE113). The area subject to the SPA designation currently extends to 761.6ha, the designated area having been extended in 2010. It comprises the artificial coastal lagoon habitat with a restricted tidal range on the western side of the railway viaduct and causeway, and the outer estuary to the east of the railway, together with areas of salt meadow and sand dune habitat on Malahide Point, and an area of shallow coastal water. The railway and its causeway to the north of the railway viaduct are not included in the SPA designation.

10.5.8 The inner estuary does not drain at low tide apart from the extreme inner part. The estuary is an important wintering bird site. The Light-bellied Brent Goose (*Branta bernicla hrota*) population is of international importance. The typically high numbers of diving birds reflect the lagoon-type nature of the inner estuary. The head of the estuary, at Seatown, traditionally known as Swords Estuary, holds a large flock of Mute Swans. The inner part of the estuary is frequently used for water sports.

10.5.9 The estuary is designated for its importance to overwintering waterbirds. The estuary is well known for holding internationally important numbers of Light-bellied Brent Geese (Crowe, 2005) and has on occasion had internationally important numbers of Black-tailed Godwit. In recent years the Irish Wetland Bird Survey (I-WeBS) counts have only recorded Black-tailed Godwit present in nationally important numbers. However, recent studies have recorded peak counts of Black-tailed Godwits in excess of the threshold for international importance.

10.5.10 A contemporary source of detailed winter counts of the estuary is presented in Lewis & Butler (2017). The estuarine study area was divided according to the subsites used during the NPWS Waterbird Survey Programme (NPWS 2013).

10.5.11 As the areas of the inner estuary close to the causeway do not drain to expose feeding areas for wading birds it is not surprising that the species assemblage recorded within 500m of the railway embankment is quite different from that recorded for instance around Seatown (Cave's Marsh). The analysis of the winter survey of 2011-2012 showed that a relatively small proportion of the birds in the inner estuary are found within 500m of the embankment. Occasionally, flocks of loafing gulls and Light-bellied Brent Geese were recorded in this part of the inner estuary. However, very few species were preferentially associated with this part of the estuary. Diving ducks, such as Great Crested Grebe and Red-breasted Merganser were frequently recorded, but in relatively small numbers. Both Shag and Cormorant fed close to the railway bridge on occasion but neither species used the area on a consistent basis. It may be concluded that the railway causeway adjoins an Internationally Important site but that the bird usage of the area close to the proposed development is relatively low. Potential disturbance impacts will need to be considered and adequate mitigation agreed with key stakeholders, including NPWS.

10.5.12 Fox droppings were recorded from the railway embankment during several site visits (on both sides of the railway bridge). Brown Rat (*Rattus norvegicus*) was observed on a number of occasions on the rock armour that front the embankment. A sub-adult Otter (*Lutra lutra*) was recorded about 800m west of the railway embankment on the southern shore of the inner estuary on 29th September 2011 (G Fennessy, pers. obs.).

10.5.13 A bat survey during the summer of 2011 did not record any bats on the wing close to the railway embankment.

10.6 Section 5 – Kilcrea Townland

10.6.1 Most of the Kilcrea townland lies outside any area of conservation designation. The site does however intersect the Malahide Estuary SAC along a small area of gravel shore on the north side of the inner estuary, an area also within the Malahide Estuary SPA.

Habitats

10.6.2 The principal conservation interest of the site lies in areas of the site subject to periodic inundation by brackish or fresh water. These include a narrow strip of Shingle and Gravel Shores LS1 and Salt Marsh-Wet Grassland (CM2/GS4) and a hydrologically important Tidal Channels CW2. These habitats are representative of habitats annexed under Annex I of the EU natural habitats directive. Tidal Channels correspond approximately to the annexed habitat, 'Estuaries (1130)' Salt Marsh-Wet Grassland (CM2/GS4) correspond to 'Atlantic Salt Meadows (*Glauco-Puccinellietalia maritimae*) (1330)', and the Shingle Shore to the annexed habitat 'Perennial Vegetation of Stony Banks (1220)'.

10.6.3 These habitats also provide feeding habitat for a variety of birdlife in particular wader species such as Redshank (*Tringa totanus*) and Oystercatcher (*Haemotopus ostralegus*). The habitats are intrinsically linked to the adjacent Malahide SAC but with the exception of a very small area of Shingle and Gravel Shores LS1 are outside the SAC. The habitats outside the SAC are of high value local significance.

10.6.4 While the shingle shore habitat within Malahide Estuary SAC is not a habitat of qualifying interest for the SAC, an effort should be made to conserve this area of natural habitat in the course of any site works.

10.6.5 An area of wet grassland/freshwater marsh fen meadow to the north of the metalled public road (Estuary Road) is also of high value local conservation interest and supports a typical groundwater fed grassland vegetation.

10.6.6 Between Hearse Road and Estuary Road an area of unmanaged meadow is reverting to scrub. Here due to little agricultural management a complex mosaic of scrub, rank dry meadow and wet grassland has developed. Dense areas of bramble, Hawthorn (*Crataegus monogyna*), Gorse (*Ulex europaeus*), and willows (*Salix* spp.) occur. Some reeds (*Phragmites australis*) are also evident near drainage channels. This area may be described as moderate value locally important.

10.6.7 Good examples of the other habitats of this area such as hedgerows, mixed conifer woodland, dry meadow grassy verge, wet grassland and scrub are of moderate local ecological importance.

10.6.8 The other habitats as described are of low value, i.e. Improved Grassland GA1, Arable Crops BC1 are of low value.

Habitat Type	Conservation Value
Mosaic of scrub, rank dry meadow and wet grassland	Moderate Conservation Value
Wet Grassland GS4	Moderate Conservation Value
Dry Meadows and Grassy Verges GS2	Moderate Conservation Value
Amenity Grassland GA2	Low Conservation Value
Hedgerows WL1	Moderate Conservation Value
Mixed Conifer Woodland	Moderate Conservation Value
Treelines WL2	Moderate Conservation Value
Scrub WS1	Moderate-High Conservation Value
Shingle and Gravel Shores LS1	High Conservation Value
Salt Marsh-Wet Grassland CM2/GS4	High Conservation Value
Tidal Channel CW2	High Conservation Value
Wet grassland/freshwater marsh fen meadow	High Conservation Value

Ornithology

10.6.9 The fields north of the shore at Kilcrea are used by a variety of the wintering birds to feed and roost. The usage by birds of the terrestrial habitats in the vicinity of Malahide Estuary is described in detail in Roe & Lovatt (2009) which provides a year-round description of the bird distribution, diversity and abundance using various areas around the estuary, particularly farmland and amenity grassland (see Appendix H for location plan). Corresponding terrestrial count sections at Kilcrea were fully resurveyed on five occasions from October 2011 to December 2011.

10.6.10 Fields at Kilcrea corresponding to Sections E, F and G in Roe & Lovatt (2009) were resurveyed from October–December 2011 (for locations see Appendix H). On 16th November 2011 a peak of 92 Brent Geese were recorded in field E9, all of which were roosting in the middle of the large arable field. On that survey, the main concentration of Brent Geese (380) was observed roosting and feeding in a field approximately 750–1,000m west of the embankment. Red Kite, which were reintroduced at Newbridge Demesne in 2011, were observed overflying the fields west of E9 (E7 and E6) in November 2011. The area of rank grassland and scrubby hedgerow adjoining the Pill River was an area of relatively high species diversity in the 2009 survey and this result was mirrored in the 2011 walkover. Roe & Lovatt, (2009) recorded a mixture of ducks associated with the river (Teal, Wigeon and Mallard), and songbirds such as Reed Bunting and Skylark. Kingfisher was recorded on the Pill in 2009 and once again along the Pill River in November and December 2011.

10.6.11 Roe & Lovatt (2009) occasionally recorded large flocks of feeding Brent Geese in the fields between the Pill and the railway (peak of 1,600 Brent Geese in September 2009). No Brent Geese were recorded in these fields on five survey visits between October and December 2011.

10.6.12 Roe and Lovatt (2009) showed that the fields and amenity grassland all around the inner estuary are an important resource for a range of wildfowl and waders during the winter months. However, it also illustrated that, a few stand-out counts apart, the fields along the railway at Kilcrea were not especially important or consistently used by a large proportion of the local population of any species.

10.6.13 During the summer months the terrestrial lands hold many fewer species and individuals. Breeding Skylark and Linnet are present and small numbers of passage waders can be recorded. Typically, the birds present in the Kilcrea area during the summer are common lowland farmland breeding birds. Tree Sparrows are known to breed locally but not in the areas close to the railway line. Two Tree Sparrows were recorded at Kilcrea during November 2011 along with a mixed finch flock of 250 Goldfinch and Linnet moving through fields west of the greenway route (Field E7 as per Roe & Lovatt, 2009). A number of pairs of Little Egret (*Egretta garzetta*) were observed breeding in trees at Kilcrea in April 2013 (G. Fennessy, pers. obs.).

10.6.14 As mentioned above, a contemporary source of detailed winter counts of the estuary and lands at Kilcrea is presented in Lewis & Butler (2017). The estuarine study area was divided according to the subsites used during the NPWS Waterbird Survey Programme (NPWS 2013).

10.6.15 The terrestrial lands at Kilcrea were surveyed on nine occasions over the winter of 2016/2017 (Lewis & Butler 2017). These surveys did not record any Light-bellied Brent

Geese using field E9 with repeated observations to the west in field E6 with single observations of birds foraging in fields E1 and E7 in March 2017. There were a number of sightings of Lapwing in field E9 in the winter of 2016/2017 with a peak count of 33 birds observed in December 2016 (*loc cit*.). A notable difference between the results of the terrestrial survey in winter 2016/2017 (Lewis & Butler 2017) and Roe & Lovatt's earlier survey was the absence of Light-bellied Brent Geese in Section G (Kilcrea North). Indeed, only one of the SCI species of the SPA was recorded in these fields by Lewis & Butler (2017) with one sighting of 22 Redshank observed in G11.

10.6.16 Given that Malahide Estuary forms the southern boundary of the lands at Kilcrea, the presence of wintering birds is the principal ecological constraint of this area. The terrestrial habitats also are of importance to feeding and roosting birds especially during the overwintering period. The walkover studies have also revealed the location of a number of active Badger setts and areas of importance for feeding bats. These are locally important features in terms of terrestrial ecology at Kilcrea.

Mammals

10.6.17 A terrestrial mammal survey was conducted on the lands at Kilcrea, on 28th October 2011. A bat survey was also carried out over two nights in October 2011 (5th October and 27th October). A Pettersson D240x outputting time expanded calls to an Edirol R-09 digital recorder was used to take a record of bats encountered. Bat identification was confirmed by post-hoc sonogram analysis using Bat Sound (v. 3.3) software.

10.6.18 During the walkover surveys of the embankment and at Kilcrea in 2011 several mammal species were recorded, either directly or by tracks and signs. The vegetation on the west of the railway embankment is generally scrubby and dense and is relatively unmanaged.

10.6.19 Brown Rats were frequently observed in the fields and hedgerows at Kilcrea. Small mammal paths are common throughout and are especially obvious in the rank grassland near the Pill River. Given the available habitats, it is likely that several other small mammalian species, such as Field Mouse (*Apodemus sylvaticus*) and Pygmy Shrew (*Sorex minutus*), are widespread and locally common in the area. Fox scat and scent were recorded at several locations in the fields at Kilcrea and two suspected dens were located in the narrow wooded glen several hundred metres west of the railway embankment at Kilcrea. In the same narrow wooded glen a number of active Badger setts were recorded. Irish Hare were frequently observed in the stubble fields and recently resown tillage fields at Kilcrea.

10.6.20 Several of the land drains at Kilcrea as well as the River Pill have potential for Otter; however, the walkover of this area in October followed a flood event and this may have obscured any regular sprainting sites in these areas of suitable habitat.

10.6.21 Rabbit burrows and droppings were recorded along several field boundaries, particularly at the west of the walkover area. No burrows or droppings were noted along the route of the railway line. In fact other than infrequent sightings of Brown Rat and Fox scats along the railway embankment mammal activity was low. No Badger setts or Fox dens were located on or adjacent to the route of the proposed development.

10.6.22 The most consistent and active area of bat activity was near Kilcrea Equestrian Centre. The roadway to the shore is tree-lined and there is a large old stone wall with good potential for roosting bats. Post-hoc analysis of the bat recordings taken on the nights

of the 5th and 27th October confirmed the presence of two species, Common Pipistrelle (*Pipistrellus pipistrellus*) and Soprano Pipistrelle (*Pipistrellus pygmaeus*). Near Kilcrea Equestrian Centre there was considerable social calling noted on both survey nights. Common Pipistrelle were especially active in this area and it is a suitable area for foraging and may also be close to a roost site.

10.7 Section 6 – Newbridge Demesne

10.7.1 The site comprises a parkland area, with relict parkland trees and shrubs, a mosaic of meadow and wet grassland traversed by a series of metalled paths and roads.

10.7.2 Here scattered trees, standing alone or in small clusters, cover less than 30% of the total area under consideration but are a prominent structural feature of the site.

10.7.3 The parkland occurs in mosaic with rank and mown grassland which comprises a mosaic of meadow and wet grassland, depending on the moisture content of the underlying soil at the site.

10.7.4 This habitat comprises a sward that is now not fertilised but is regularly mown.

10.7.5 Tall trees which occur in a parkland planting are, for example, Oak (*Quercus* sp.), Ash (*Fraxinus excelsior*), Birch (*Betula* sp.), Beech (*Fagus sylvatica*) and Sycamore (*Acer pseudoplatanus*).

10.7.6 The dry meadow of the park supports a high proportion of tall, coarse and tussocky grasses such as False Oat-grass (*Arrhenatherum elatius*) and Cock's-foot (*Dactylis glomerata*). Other grasses include Yorkshire-fog (*Holcus lanatus*), and Smooth Meadow-grass (*Poa pratensis*). The broadleaved herb component is characterised by species such as Hogweed (*Heracleum sphondylium*), Nettle (*Urtica dioica*), Sorrel (*Rumex acetosa*), and Dock species.

10.7.7 A mosaic of this dry meadow habitat occurs with elements of wet grassland in parts of the site. The species of the drier meadow grades to areas dominated by species of wet grassland such as rushes (*Juncus effusus*), Sweet Vernal Grass (*Anthoxanthum odoratum*), Yorkshire Fog Grass (*Holcus lanatus*), Creeping Bent Grass (*Agrostis stolonifera*), Creeping Buttercup (*Ranunculus repens*) and Sorrel (*Rumex acetosa*).

10.7.8 Some patches of planted ornamental shrubs occur at the site. Such plantings are in character with the parkland nature of the site.

10.7.9 Along the boundary wall of the demesne plantations of mixed broadleaved woodland occur with typical species assemblage.

10.7.10 A number of different broadleaved tree species contribute significantly to the canopy and include Oak (*Quercus robur*), Sycamore (*Acer pseudoplatanus*), Beech (*Fagus sylvatica*) and Ash (*Fraxinus excelsior*) being the dominant species.

10.7.11 Non-native shrubs also occur in the understorey, in particular the non-native Cherry Laurel (*Prunus laurocerasus*) together with Elder (*Sambucus nigra*), a little Holly (*Ilex aquifolium*) and Hawthorn (*Crataegus monogyna*).

10.7.12 The woodland understorey at the site is dominated by Ivy (*Hedera helix*), with some typical species of the woodland ground flora such as Lords and Ladies (*Arum maculatum*),

Lesser Celandine (*Ranunculus ficaria*), Wood Sedge (*Carex sylvatica*), Wood Speedwell (*Veronica montana*), False Brome (*Brachypodium sylvaticum*) and ferns (*Dryopteris filix-mas, Polystichum setiferum*, *Asplenium scolopendrium*).

10.7.13 Good examples of the mixed broadleaf woodland, are of high to moderate local ecological importance.

10.7.14 The parkland habitat is highly modified and is of low ecological value.

Habitat Type	Conservation Value
Wet grassland GS4	Moderate-High Conservation Value
Dry meadows and grassy verges GS2	Moderate Conservation Value
Amenity Grassland GA2	Low Conservation Value
Hedgerows WL1	Moderate Conservation Value
Mixed broadleaf Woodland	Moderate to High Conservation Value
Treelines WL2	Moderate Conservation Value

10.7.15 A route from northern Kilcrea into Newbridge Demesne will traverse the habitats present, probably utilising the existing network of internal roads and pathways. Newbridge Demesne was a release site for reintroduced Red Kite (*Milvus milvus*) in 2011. A survey of the breeding birds in the woodlands at Newbridge Demesne in 2005 recorded 34 species (Merne & Roe, 2006). Notable amongst the birds breeding at the site included Long-eared Owl (*Asio otus*), Sparrowhawk (*Accipiter nisus*), Blackcap (*Sylvia atricapilla*) and Jay (*Garrulus glandarius*). Newbridge Demesne was one of the sites selected for the first BioBlitz biodiversity recording competition in 2010. Over a two day period (21-22 May 2010) a total of 46 bird species were recorded, as well as two bat species, Leisler's Bat (*Nyctalus leisleri*) and Soprano Pipistrelle. A number of mammal species were recorded, although neither Badger nor Otter were present.

10.7.16 The wooded parkland and open grassland areas are of local importance of moderate/high value for terrestrial fauna. The demesne is a public amenity area with a good network of internal pathways which may be incorporated into the proposed development.

10.8 Summary of Habitat Constraints

10.8.1 The key ecological constraints within the study area include the following habitats.

Habitat Type	Conservation Value
Section 1 – Malahide Demesne	
Treelines WL2	Moderate Conservation Value
Sections 2 & 3 – Malahide Road & Village	
Mixed Broadleaf Woodland	Moderate to High Conservation Value
Section 4 – Railway Causeway	
Habitats of SAC/SPA/pNHA	No Conservation Value
Section 5 – Kilcrea Townland	
Mosaic of scrub, rank dry meadow and wet grassland	Moderate Conservation Value
Wet Grassland GS4	Moderate Conservation Value
Dry Meadows and Grassy Verges GS2	Moderate Conservation Value
Hedgerows WL1	Moderate Conservation Value
Mixed Conifer Woodland	Moderate Conservation Value

Habitat Type	**Conservation Value**
Malahide Estuary SPA (adjoining)	International Importance
Treelines WL2	Moderate Conservation Value
Scrub WS1	Moderate-High Conservation Value
Shingle and Gravel Shores LS1	High Conservation Value
Salt Marsh-Wet Grassland (CM2/GS4)	High Conservation Value
Tidal Channel CW2	High Conservation Value
Wet grassland/freshwater marsh fen meadow	High Conservation Value
Section 6 – Newbridge Demesne	
Wet Grassland GS4	Moderate-High Conservation Value
Dry Meadows and Grassy Verges GS2	Moderate Conservation Value
Hedgerows WL1	Moderate Conservation Value
Mixed broadleaf woodland	Moderate to High Conservation Value
Treelines WL2	Moderate Conservation Value

11.0 Air Quality and Climate

11.1 Introduction

11.1.1 This chapter identifies the air quality and climate constraints in the study area. For the purposes of this constraints study the requirements outlined in the Transport Infrastructure Ireland (TII) (formerly the National Roads Authority (NRA)) *Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes* (TII, 2011) have been used as a basis for this chapter. Therefore, the main objectives of the air quality input into the constraints study are to describe the existing ambient air quality and identify the main sources of air pollution and the most sensitive receptor locations within the study area.

11.2 Methodology and Sources of Information

11.2.1 The following items are the principal focus of the study:

- Identification of existing sensitive receptors.
- Identification of any existing air pollution sources in the area.
- Description of the existing air quality in the region.
- Discussion of opportunities for mitigation.

11.2.2 This report has been prepared in accordance with the TII document *Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes* (TII, 2011).

11.2.3 The following sources were used for the purpose of this study:

- EPA (2016) Air Quality in Ireland 2015 - Key Indicators of Ambient Air Quality (and previous annual reports 1997-2015).
- EPA (2017) http://www.epa.ie/whatwedo/monitoring/air.
- EPA (2017) http://www.epa.ie/whatwedo/licensing/ippc.
- NPWS (2017) http://webgis.npws.ie/npwsviewer/.

Air Quality Standards

11.2.4 In order to reduce the risk to health from poor air quality, national and European statutory bodies have set limit values in ambient air for a range of air pollutants. These limit values or "Air Quality Standards" are health- or environmental-based levels for which additional factors may be considered. For example, natural background levels, environmental conditions and socio-economic factors may all play a part in the limit value which is set.

11.2.5 The applicable standards in Ireland include the Air Quality Standards Regulations 2011, which incorporate EU Directive 2008/50/EC, which has set limit values for SO_2, NO_2, PM_{10}, $PM_{2.5}$, benzene and CO (see Table 11.1 below). Although the EU Air Quality Limit Values are the basis of legislation, other thresholds outlined by the EU Directives are used which are triggers for particular actions.

Table 11.1 Air Quality Standards Regulations 2011 (Based on Directive 2008/50/EC and SI 180 of 2011).

Pollutant	Regulation [Note 1]	Limit Type	Margin of Tolerance	Value
Nitrogen Dioxide	2008/50/EC	Hourly limit for protection of human health - not to be exceeded more than 18 times/year	40% until 2003 reducing linearly to 0% by 2010	200µg/m^3 NO_2
		Annual limit for protection of human health	40% until 2003 reducing linearly to 0% by 2010	40µg/m^3 NO_2
		Annual limit for protection of vegetation	None	30µg/m^3 NO + NO_2
Lead	2008/50/EC	Annual limit for protection of human health	100%	0.5µg/m^3
Sulphur dioxide	2008/50/EC	Hourly limit for protection of human health - not to be exceeded more than 24 times/year	150µg/m^3	350µg/m^3
		Daily limit for protection of human health - not to be exceeded more than 3 times/year	None	125µg/m^3
		Annual & winter limit for the protection of ecosystems	None	20µg/m^3
Particulate Matter (as PM_{10})	2008/50/EC	24-hour limit for protection of human health - not to be exceeded more than 35 times/year	50%	50µg/m^3 PM_{10}
		Annual limit for protection of human health	20%	40µg/m^3 PM_{10}
$PM_{2.5}$ (Stage 1)	2008/50/EC	Annual limit for protection of human health	20% from June 2008. Decreasing linearly to 0% by 2015	25µg/m^3 $PM_{2.5}$
$PM_{2.5}$ [Note 2] (Stage 2)	-	Annual limit for protection of human health	None	20µg/m^3 $PM_{2.5}$
Benzene	2008/50/EC	Annual limit for protection of human health	100% until 2006 reducing linearly to 0% by 2010	5µg/m^3
Carbon Monoxide	2008/50/EC	8-hour limit (on a rolling basis) for protection of human health	60%	10mg/m^3 (8.6 ppm)

Note 1. EU 2008/50/EC – Clean Air For Europe (CAFÉ) Directive replaces the previous Air Framework Directive (1996/30/EC) and daughter directives 1999/30/EC and 2000/69/EC.

Note 2. EU 2008/50/EC states - 'Stage 2 — indicative limit value to be reviewed by the Commission in 2013 in the light of further information on health and environmental effects, technical feasibility and experience of the target value in Member States'.

11.3 Receiving Environment

Meteorological Data

11.3.1 A key factor in assessing temporal and spatial variations in air quality is the prevailing meteorological conditions. Depending on wind speed and direction, individual receptors may experience very significant variations in pollutant levels under the same source strength (i.e. traffic levels) (WHO, 2006). Wind is of key importance in dispersing air pollutants and for ground level sources, such as traffic emissions, pollutant concentrations are generally inversely related to wind speed. Thus, concentrations of pollutants derived from traffic sources will generally be greatest under very calm conditions and low wind speeds when the movement of air is restricted. In relation to PM_{10}, the situation is more complex due to the range of sources of this pollutant, and thus measured levels of PM_{10} can be a non-linear function of wind speed.

11.3.2 The nearest representative weather station collating detailed weather records is Dublin Airport meteorological station, which is located approximately 6.5km southwest of the site. For data collated during five representative years (2012-2016), the predominant wind direction is westerly and southwesterly with an average wind speed of approximately 5m/s.

Air Quality Zones in Ireland

11.3.3 As part of the implementation of the Framework Directive on Air Quality (1996/62/EC), four air quality zones have been defined in Ireland for air quality management and assessment purposes (EPA, 2017). Dublin is defined as Zone A and Cork as Zone B. Zone C is composed of 21 towns with a population of greater than 15,000. The remainder of the country, which represents rural Ireland but also includes all towns with a population of less than 15,000, is defined as Zone D. In terms of air monitoring, the study area south of the Malahide Estuary is categorised as Zone A whilst the study area within the Malahide Estuary and north of the estuary around Donabate is categorised as Zone D (EPA, 2016).

EPA/Local Authority Monitoring Programmes

11.3.4 Air quality monitoring programs have been undertaken throughout Ireland in recent years by the EPA and Local Authorities. The most recent EPA annual report on air quality monitoring undertaken throughout Ireland is entitled *Air Quality In Ireland 2015 - Key Indicators of Ambient Air Quality* (EPA, 2016). Although no EPA or Local Authority monitoring has been carried out within the study area, data from Zone A and Zone D locations in Ireland can be used to provide an indication of the prevailing air quality conditions.

Review of EPA Monitoring Data

11.3.5 With regard to NO_2, continuous monitoring data from the EPA at suburban Zone A locations in Rathmines, Ballyfermot, Dun Laoghaire, Swords and Blanchardstown show that current levels of NO_2 are below the annual limit value with no exceedances of the one-hour limit value. Average levels ranged from 13µg/m^3 in Swords to 25µg/m^3 in Blanchardstown in 2015. Based on these results, a conservative estimate of the background NO_2 concentration in Malahide in 2017 is 20µg/m^3.

11.3.6 The results of NO_2 monitoring carried out at the urban Zone D locations in Castlebar, Emo Court and Kilkitt in 2015 indicated an average NO_2 concentration of between 2-8µg/m^3 with no exceedances of the one-hour limit value. Long-term NO_2 monitoring was carried out at two Zone C locations, Kilkenny Seville Lodge and Portlaoise. The NO_2 annual average in 2015 for these sites was between 5-10µg/m^3 with no exceedance of the one-hour limit value. Hence, the long-term average concentrations measured at these locations were significantly lower than the annual average limit value of 40µg/m^3. Based on the above information, a conservative estimate of the 2017 background NO_2 concentration in Donabate is 12µg/m^3.

11.3.7 Continuous PM_{10} monitoring carried out at the suburban locations of Rathmines, St Anne's Park, Davitt Road, Ballyfermot, Dun Laoghaire and Tallaght showed average levels of 12-17µg/m^3 in 2015, with at most nine exceedances (in Blanchardstown) of the 24-hour limit value of 50µg/m^3 (35 exceedances are permitted per year). In addition, the average PM_{10} level at the urban background monitoring location in the Phoenix Park in 2015 was 12µg/m^3, with only two exceedances of 50µg/m^3. Based on the EPA data, a conservative estimate of the background PM_{10} concentration in Malahide in 2013 is 18µg/m^3.

11.3.8 Long-term PM_{10} monitoring was carried out at the urban Zone D locations of Castlebar and Claremorris in 2015. The average concentrations measured at each of these sites were 13 and 10µg/m^3, respectively. Long-term PM_{10} measurements carried out at the rural Zone D location in Kilkitt in 2015 gave an average level of 9µg/m^3. Based on the above information a conservative estimate of the 2017 background PM_{10} concentration for Donabate in 2013 is 14µg/m^3.

Air Pollution Sources

11.3.9 The major source of air pollution within the study area is road traffic from the R106, R124, R126 and to a lesser extent, the local roads in Malahide and Donabate. Air quality is variable and subject to significant spatial variation, with concentrations generally falling significantly with distance from major road sources (EPA, 2016). The Dublin to Belfast Rail Line is also a minor source of air pollution within the study area.

11.3.10 A review of IPPC licences issued by the EPA (2017) for the region shows no IPPC licensed facilities with emissions to atmosphere within the study area.

11.4 Summary

11.4.1 In general, the sensitive receptors consist primarily of residential houses located in Malahide, Donabate and Kilcrea Townland. A number of schools are also located in these areas. The most sensitive receptor with respect to air quality impacts on ecology is the Malahide Estuary which is classified as a pNHA, SPA and SAC.

11.4.2 The potential routes in the Malahide Village section of the scheme are in close proximity to a significant level of sensitive receptors. However, due to the nature of this scheme, the existing air quality and the limited and temporary nature of construction activities, it is unlikely that any of the sensitive receptors will experience concentrations which exceed the ambient limit values, and would not act as a key constraint.

12.0 Noise and Vibration

12.1 Introduction

12.1.1 This chapter identifies the noise and vibration constraints in the study area. For the purposes of this constraints study the requirements outlined in the Transport Infrastructure Ireland (TII) *Guidelines for the Treatment of Noise & Vibration* have been used as a basis for this chapter. Therefore, the main objective of the noise input into the constraints study is to identify any receptors that may be deemed to be partially sensitive to noise and/or vibration.

12.1.2 Appendix I presents a glossary of the acoustic terminology used in this chapter.

12.2 Methodology

12.2.1 For the purposes of this assessment it is appropriate to clearly define what is considered noise and additionally what constitutes a noise sensitive location. The following definitions have been sourced from the Environmental Protection Agency (EPA) document *Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities*:

- "noise – any sound, that has the potential to cause disturbance, discomfort or psychological stress to a person exposed to it, or any sound that could cause actual physiological harm to a person exposed to it, or physical damage to any structure exposed to it, is known as noise."
- "noise sensitive location NSL – any dwelling house, hotel or hostel, health building, educational establishment, place of worship or entertainment, or any other facility or other area of high amenity which for its proper enjoyment requires the absence of noise at nuisance levels."

12.2.2 While the definitions presented in the NG4 guidance are of assistance here the overall guidance contained within the document should be considered in the light of the following applicability statement contained within the document: "Note that the guidance within this document relates to the assessment and measurement of noise in relation to Agency scheduled activities only. The guidance does not relate to construction and/or off-site transportation noise. For any construction related noise, this process is generally covered by the conditions of the planning permission and it does not relate to the licensable activity on site.... All off-site transportation activities and construction related issues are typically covered in other guidance documents and best practice standards (see Chapter 11). In other instances, a competent person should be retained to develop a suitably robust noise assessment protocol for the issue in question."

12.2.3 It is considered that any detailed noise assessment carried out on the proposal in question will require detailed consideration to any proposed noise criteria and that a verbatim application of EPA guidance may not be appropriate.

12.2.4 The following items are the principal focus of the study:

- identification of existing noise and vibration sensitive receptors;
- identification of any existing noise and vibration sources in the area;
- a qualitative description of the existing noise and vibration climate; and
- discussion of opportunities for mitigation.

12.2.5 This report has been prepared in accordance with Chapter 4 of the *Guidelines for the Treatment of Noise and Vibration in National Road Schemes, Revision 1, 25 October 2004*.

12.3 Receiving Environment

General Description of Prevailing Noise Climate

12.3.1 A general description of the noise environment along various sections of the proposed development is detailed in the following paragraphs. Appendix J-Figure 14 divides the proposed development into various sections to facilitate this discussion.

Section A

12.3.2 This section considers the area where the proposed development commences in the town of Malahide and runs to the edge of the estuary. It is identified by the blue hatched line in Appendix J-Figure 14.

12.3.3 The ambient noise levels (i.e. L_{Aeq} levels) are dictated by road traffic noise associated with the local network. Ambient noise levels are also affected, by varying degrees depending on proximity, by train movements on the Dublin to Belfast rail line. Aircraft noise associated with Dublin Airport would also be expected in the area.

12.3.4 The strategic noise mapping completed by Fingal County Council for the area as part of the requirements of the Environmental Noise Regulations[2] (2006) has been reviewed and the expected ambient noise levels in the area are as follows:

L_{day} (dB)	$L_{evening}$ (dB)	L_{night} (dB)	L_{den} (dB)
55–65	55–60	45–55	60–65

12.3.5 Note that review of the relevant strategic noise maps of the Malahide Demesne indicate that existing noise levels are some 10dB below the levels stated in the above table.

12.3.6 Background noise levels in the area will be typically dictated by distant road traffic noise and wind generated noise and other anthropogenic sources.

Section B

12.3.7 Covering the section of the proposed development across Malahide Estuary and passes through the Malahide Estuary SPA/SAC/pNHA. This section is identified by the green hatched line in Appendix J-Figure 14.

12.3.8 The ambient noise levels (i.e. L_{Aeq} levels) are dictated by noise associated with train movements along the Dublin to Belfast railway line.

12.3.9 The strategic noise mapping completed by Fingal County Council for the area has been reviewed and the expected ambient noise levels in the area are as follows:

L_{day} (dB)	$L_{evening}$ (dB)	L_{night} (dB)	L_{den} (dB)
55–60	55–60	50–55	60–65

12.3.10 Background noise levels in the area will be typically dictated by distant road traffic noise and wind generated noise and other anthropogenic sources.

[2] Which transpose into Irish law EU Directive 2002/49/EC.

Section C

12.3.11 This section considers the area where the proposed development may pass through the Newbridge Demesne and into the town of Donabate. It is identified by the red hatched line in Appendix J-Figure 14.

12.3.12 The ambient noise levels (i.e. L_{Aeq} levels) are dictated by road traffic noise associated with the local network depending on the proximity to this infrastructure.

12.3.13 The strategic noise mapping completed by Fingal County Council for the area has been reviewed and the expected ambient noise levels in the area are as follows:

L_{day} (dB)	$L_{evening}$ (dB)	L_{night} (dB)	L_{den} (dB)
≤45–50	≤45–50	≤45–50	≤45–55

12.3.14 Background noise levels in the area will be typically dictated by distant road traffic noise and wind generated noise and other anthropogenic sources.

Section D

12.3.15 This section considers the area where the proposed development may pass through the townland of Kilcrea and follows the coastline with the estuary before turning north and following an existing road. It is identified by the orange hatched line in Appendix J-Figure 14.

12.3.16 The ambient noise levels (i.e. L_{Aeq} levels) are dictated by road traffic noise associated with the local network depending on the proximity to this infrastructure.

12.3.17 The strategic noise mapping completed by Fingal County Council for the area has been reviewed and the expected ambient noise levels in the area are as follows:

L_{day} (dB)	$L_{evening}$ (dB)	L_{night} (dB)	L_{den} (dB)
≤45–55	≤45–50	≤45–50	≤45–60

12.3.18 Background noise levels in the area will be typically dictated by distant road traffic noise and wind generated noise and other anthropogenic sources.

Section E

12.3.19 This section considers the area where the proposed development may pass through the middle portion of the townland of Kilcrea. It is identified by the purple hatched line in Appendix J-Figure 14.

12.3.20 The ambient noise levels (i.e. L_{Aeq} levels) and background noise levels are dictated by distant road traffic noise associated with the local network depending on the proximity to this infrastructure along with other anthropogenic sources.

12.3.21 The strategic noise mapping completed by Fingal County Council for the area has been reviewed and the expected ambient noise levels in the area are as follows:

L_{day} (dB)	$L_{evening}$ (dB)	L_{night} (dB)	L_{den} (dB)
≤45–50	≤45–50	≤45–50	≤45–55

Noise and Vibration Sensitive Locations

12.3.22 In general the noise sensitive locations consist primarily of residential houses located in the towns of Donabate and Malahide at the peripheral ends of the proposed development (i.e. Sections A and B of Appendix J-Figure 14) and along local roads (i.e. northern half of Section D of Appendix J-Figure 14).

12.3.23 Other noise sensitive areas that should be noted relate to the Malahide Estuary SPA for its amenity and ecological value and the Newbridge demesne, again for its amenity value.

Existing Noise and Vibration Sources

12.3.24 As discussed the significant noise sources in the area relate to infrastructural elements including:

- the local road network;
- Dublin to Belfast railway line; and
- aircraft flight paths.

12.3.25 Vibration levels in the vicinity of existing sensitive properties are typically dictated by traffic movements on local roads and rail network. Levels associated with existing roads and rail would not be expected to be of a magnitude sufficient to cause disturbance to people or structural damage to property.

12.4 Opportunities for Mitigation

12.4.1 It is considered that the construction phase of the development would have the greater potential to generate noise and vibration impacts. In general, good practice measures as contained within *BS 5228: 200 – Code of practice for noise and vibration control on construction and open sites – Part 1: Noise and Part 2: Vibration* should be considered and implemented where necessary in order to mitigate any issues that may arise.

12.5 Summary

12.5.1 The prevailing noise climate in the constraints study area varies from:

- urban areas (i.e. Malahide, Donabate) which are likely to experience an elevated noise level typical of such urban areas due to road traffic flows, rail noise and aircraft movements;

- semi-rural areas (e.g. Newbridge Demesne, Kilcrea townland) with low ambient and background noise levels due to distant road noise etc; and

- a section of an SPA (e.g. rail embankment crossing the Malahide Estuary) where rail movements along the Dublin to Belfast railway line typically dictate ambient noise levels.

12.5.2 The most sensitive receptors in terms of noise and vibration are residential properties and certain wildlife within the SPA in the study area. The latter of these receptors being typically more sensitive to construction activities potentially associated with the development.

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- Malahide Marina (http://www.malahidemarina.net/)
- Malahide Sea Scouts (http://www.malahideseascouts.ie/)
- Malahide Yacht Club (http://www.myc.ie/)
- Swords Sailing & Boating Club (http://www.swordssailing.ie/Home.aspx)

Kilcrea Townland

- Kilcrea Equestrian Centre (http://www.kilcreaequestrian.ie/)

Newbridge Demesne/ Donabate

- Balcarrick Golf Club (http://www.balcarrickgolfclub.com/)
- Beaverstown Golf Club (http://www.beaverstown.com/)
- Community and Leisure Centre (http://www.donabatecommunitycentre.com/)
- Corballis Links Golf Club (http://www.corballislinks.com/)
- Donabate and Portrane Sea Scouts (http://www.scouttalk.ie/section.php?orgID=224)
- Donabate Community College (http://www.donabatecc.ie/)
- Donabate Golf Club (http://www.donabategolfclub.com/)
- Donabate Portrane Community Council http://www.donabateparishcouncil.com/)
- Donabate Presbyterian Church (http://www.donabatepc.org/)
- Donabate Tidy Towns (http://donabatetidytowns.blogspot.ie/)
- Educate Together National School (http://www.dpetns.ie/)
- Portrane Hockey Club (http://www.portranehockeyclub.com/)
- St Ita's AFC (http://www.stitasfc.com/)
- St Michael's House (http://www.smh.ie/)
- St Patrick's Boys' National School (http://www.stpatsbns.ie/)
- St Patrick's Church of Ireland Church (http://dublin.anglican.org/swords/index.php)
- St Patrick's GAA Club (http://www.stpatsgaa.com/)
- St Patrick's Girls' National School (http://www.scoilphadraiccailini.ie/)
- St Patrick's Roman Catholic Church (http://www.donabateparish.ie/)
- The Island Golf Club (http://www.theislandgolfclub.com/)

Appendices

Appendix A
Statutory Protection of Architectural Heritage in the Study Area

TABLE 1 Sites Listed in the Record of Monuments and Places (RMP) within the Study Area.

AHC No.	Site Type	Townland	RMP No.
001	Country House	Malahide Demesne	DU012-030----
005	Church, Undetermined	Malahide Demesne	DU012-031001-
006	Graveyard	Malahide Demesne	DU012-031006-
032	Church, Undetermined	Kilcrea	DU012-016001-
033	Graveyard	Kilcrea	DU012-016002-
036	Mill, Tidal	Kilcrea	DU012-018----
040	Country House	Newbridge Demesne	DU012-060----
049	Church, C of I	Donabate	DU012-005001-
050	Graveyard	Donabate	DU012-005003-
051	Architectural Fragment	Donabate	DU012-005004-

TABLE 2 Sites Listed in the Record of Protected Structures (RPS) within the Study Area.

AHC No.	Site Type	Townland	RPS No.
001	Country House	Malahide Demesne	383
003	Outbuildings	Malahide Demesne	383
004	House	Malahide Demesne	383
005	Church, Undetermined	Malahide Demesne	384
006	Graveyard	Malahide Demesne	384
007	Gate Lodge	Malahide Demesne	383
008	Gate Lodge	Malahide Demesne	383
009	Lime Kiln	Malahide Demesne	382
010	Country House	Auburn	448
012	Outbuildings	Auburn	448
013	Milestone	Auburn	447
016	Vernacular House	Yellow Walls	380
017	House	Malahide	436
019	Railway Station	Malahide	388
022	Bridge	Malahide	423
023	Viaduct	Malahide	420
024	Vernacular House	Malahide	381
025	Milestone	Malahide	386
026	Church, Presbyterian	Malahide	426
027	House	Malahide	425
028	House	Malahide	424
030	Vernacular House	Malahide	381
031	Bridge	Kilcrea	502
032	Church, Undetermined	Kilcrea	499
033	Graveyard	Kilcrea	499
034	Country House	Kilcrea	500
036	Mill, Tidal	Kilcrea	501
037	Country House	Ballymadrough	483
039	Outbuildings	Ballymadrough	483

AHC No.	Site Type	Townland	RPS No.
040	Country House	Newbridge Demesne	494
042	Outbuildings	Newbridge Demesne	494
044	Gate Entrance	Newbridge Demesne	494
047	Gate Lodge	Donabate	495
049	Church, C of I	Donabate	508
052	House	Donabate	506
053	Water Pump	Donabate	507
054	Vernacular House	Donabate	505
055	Public House	Corballis	509
057	Railway Station	Beaverstown	511
058	Station Master's House	Beaverstown	510
062	House	Beaverstown	513
064	Church, RC	Beaverstown	512
065	Vernacular House	Beaverstown	514

TABLE 3 Architectural Conservation Areas (ACAs) within the Study Area.

AHC No.	Site Type	Townland	ACA Ref. No.
002	Malahide Castle Demesne	Malahide Demesne	N/A
018	Malahide Historic Core	Malahide	N/A
041	Newbridge House Demesne	Newbridge Demesne	N/A
046	The Square	Donabate	N/A

TABLE 4 Sites in the Architectural Inventory within the Study Area.

AHC No.	Site Type	Townland	NIAH Ref. No.
001	Country House	Malahide Demesne	20904204
003	Outbuildings	Malahide Demesne	20904206
004	House	Malahide Demesne	20904207
005	Church, Undetermined	Malahide Demesne	20904201
006	Graveyard	Malahide Demesne	20904101
007	Gate Lodge	Malahide Demesne	20904104
008	Gate Lodge	Malahide Demesne	20903211
013	Milestone	Auburn	20903204
019	Railway Station	Malahide	20903209
020	Signal Box	Malahide	20903205
021	Pedestrian Gateway	Malahide	20903206
022	Bridge	Malahide	20903207
024	Vernacular House	Malahide	20903208
025	Milestone	Malahide	20903235
029	School	Malahide	20903304
030	Vernacular House	Malahide	20903303
031	Bridge	Kilcrea	20903307
034	Country House	Kilcrea	20903308
037	Country House	Ballymadrough	20903309
039	Outbuildings	Ballymadrough	20816007
040	Country House	Newbridge Demesne	20903306
042	Outbuildings	Newbridge Demesne	20903302
043	Bridge	Newbridge Demesne	20903201
044	Gate Entrance	Newbridge Demesne	20903202
045	Bridge	Newbridge Demesne	20816008
048	Glebe House	Donabate	20816009
049	Church, C of I	Donabate	20816010

AHC No.	Site Type	Townland	NIAH Ref. No.
052	House	Donabate	20816006
053	Water Pump	Donabate	20816001
054	Vernacular House	Donabate	20816021
055	Public House	Corballis	20816022
057	Railway Station	Beaverstown	20816003
058	Station Master's House	Beaverstown	20816004
059	Signal Box	Beaverstown	20816005
060	Bridge	Beaverstown	20903310
063	Graveyard	Beaverstown	20903310
065	Vernacular House	Beaverstown	20903311

Appendix B
Unregistered Architectural Heritage Sites in the Study Area

TABLE 1 Unregistered Architectural Heritage Sites within the Study Area.

AHC No.	Site Type	Townland
011	Demesne	Auburn
014	Mill, Cotton	Yellow Walls
015	House	Yellow Walls
035	Demesne	Kilcrea
036	Demesne	Ballymadrough
056	House	Donabate
061	Parish Hall	Beaverstown

Appendix C
Architectural Heritage – Sites of National, Regional and Local Importance in the Study Area

TABLE 1 Sites Deemed to be of National Importance within the Study Area.

AHC No.	Site Type	Site Name	Townland
001	Country House	Malahide Castle	Malahide Demesne
005	Church, Undetermined	Malahide Abbey	Malahide Demesne
006	Graveyard	Malahide Abbey	Malahide Demesne
037	Country House	Seafield	Ballymadrough
039	Outbuildings	Seafield	Ballymadrough
040	Country House	Newbridge House	Newbridge Demesne

TABLE 2 Sites Deemed to be of Regional Importance within the Study Area.

AHC No.	Site Type	Site Name	Townland
002	Demesne	Malahide Castle	Malahide Demesne
003	Outbuildings	Malahide Castle	Malahide Demesne
004	House	House	Malahide Demesne
007	Gate Lodge	Malahide Castle	Malahide Demesne
008	Gate Lodge	Malahide Castle	Malahide Demesne
009	Lime Kiln	Malahide Castle	Malahide Demesne
010	Country House	Auburn House	Auburn
011	Demesne	Auburn House	Auburn
012	Outbuildings	Auburn House	Auburn
013	Milestone	Milestone	Auburn
016	Vernacular House	Unnamed	Yellow Walls
017	Town House	Tír na nÓg	Malahide
018	Historic Town	Malahide Historic Core	Malahide
019	Railway Station	Malahide Railway Station	Malahide
020	Signal Box	Malahide Railway Station	Malahide
021	Pedestrian Gateway	Malahide Railway Station	Malahide
022	Bridge	Railway Bridge	Malahide
023	Viaduct	Malahide Railway Viaduct	Malahide
024	Vernacular House	Casino	Malahide
025	Milestone	Milestone	Malahide
026	Church, Presbyterian	Malahide Presbyterian Church	Malahide
027	Town House	Sonas	Malahide
028	Town House	Rosca	Malahide
029	School	Malahide School	Malahide
030	Vernacular House	Unnamed	Malahide
031	Bridge	Railway Bridge	Kilcrea
032	Church, undetermined	Kilcrea Church	Kilcrea
033	Graveyard	Kilcrea Cemetery	Kilcrea
034	Country House	Kilcrea House	Kilcrea
038	Demesne	Seafield	Ballymadrough
041	Demesne	Newbridge House	Newbridge Demesne
042	Outbuildings	Newbridge House	Newbridge Demesne
043	Bridge	Bridge	Newbridge Demesne

AHC No.	Site Type	Site Name	Townland
044	Gate Entrance	Newbridge House	Newbridge Demesne
045	Bridge	Mack's Bridge	Newbridge Demesne
046	Square	The Square	Donabate
048	Glebe House	The Vicarage	Donabate
049	Church, C of I	St Patrick's Church	Donabate
050	Graveyard	St Patrick's Church	Donabate
052	House	The Cottage	Donabate
053	Water Pump	Water Pump	Donabate
054	Vernacular House	Former Forge	Donabate
055	Public House	Smyth's Pub	Corballis
056	House	Prospect House	Donabate
057	Railway Station	Donabate Railway Station	Beaverstown
058	Station Master's House	Donabate Railway Station	Beaverstown
059	Signal Box	Donabate Railway Station	Beaverstown
060	Bridge	Railway Bridge	Beaverstown
061	Parish Hall	St Patrick's Hall	Beaverstown
062	Town House	An Dun	Beaverstown
063	Graveyard	Donabate Cemetery	Beaverstown
064	Church, RC	St Patrick's Church	Beaverstown
065	Vernacular House	The Cottage	Beaverstown

TABLE 3 Sites Deemed to be of Local Importance within the Study Area.

AHC No.	Site Type	Site Name	Townland
014	Mill, Cotton	Unnamed	Yellow Walls
015	House	Unnamed	Yellow Walls
035	Demesne	Kilcrea House	Kilcrea
036	Mill, Tidal	Ballytray Corn Mill	Kilcrea
047	Gate Lodge	Newbridge House	Newbridge House
051	Wall Monument	St Patrick's Church	Donabate

Appendix D
Architectural Heritage – Key Constraints in the Study Area

TABLE 1 Key Constraints in the Study Area.

AHC No.	Site Type	Site Name	Townland	Perceived Importance
001	Country House	Malahide Castle	Malahide Demesne	National
002	Demesne	Malahide Castle Demesne	Malahide Demesne	Regional
003	Outbuildings	Malahide Castle	Malahide Demesne	Regional
004	House	House	Malahide Demesne	Regional
005	Church, undetermined	Malahide Abbey	Malahide Demesne	National
006	Graveyard	Malahide Abbey	Malahide Demesne	National
007	Gate Lodge	Malahide Castle	Malahide Demesne	Regional
008	Gate Lodge	Malahide Castle	Malahide Demesne	Regional
009	Lime Kiln	Lime Kiln	Malahide Demesne	Regional
010	Country House	Auburn House	Auburn	Regional
011	Demesne	Auburn House	Auburn	Regional
012	Outbuildings	Auburn House	Auburn	Regional
016	Vernacular House	Unnamed	Yellow Walls	Regional
017	Town House	Tír na nÓg	Malahide	Regional
018	Historic Town	Malahide Historic Core	Malahide	Regional
019	Railway Station	Malahide Railway Station	Malahide	Regional
020	Signal Box	Malahide Railway Station	Malahide	Regional
021	Pedestrian Gateway	Malahide Railway Station	Malahide	Regional
022	Bridge	Railway Bridge	Malahide	Regional
023	Viaduct	Malahide Railway Viaduct	Malahide	Regional
024	Vernacular House	Casino	Malahide	Regional
026	Church, Presbyterian	Malahide Presbyterian Church	Malahide	Regional
027	Town House	Sonas	Malahide	Regional
028	Town House	Rosca	Malahide	Regional
029	School	Malahide School	Malahide	Regional
030	Vernacular House	Unnamed	Malahide	Regional
031	Bridge	Railway Bridge	Kilcrea	Regional
032	Church, undetermined	Kilcrea Church	Kilcrea	Regional
033	Graveyard	Kilcrea Cemetery	Kilcrea	Regional
034	Country House	Kilcrea House	Kilcrea	Regional
035	Demesne	Kilcrea House	Kilcrea	Local
036	Mill, Tidal	Baltray Corn Mill	Kilcrea	Local
037	Country House	Seafield	Ballymadrough	National
038	Demesne	Seafield	Ballymadrough	Regional
039	Outbuildings	Seafield	Ballymadrough	National
040	Country House	Newbridge House	Newbridge Demesne	National
041	Demesne	Newbridge House Demesne	Newbridge Demesne	Regional
042	Outbuildings	Newbridge House	Newbridge Demesne	Regional
043	Bridge	Bridge	Newbridge Demesne	Regional

AHC No.	Site Type	Site Name	Townland	Perceived Importance
044	Gate Entrance	Newbridge House	Newbridge Demesne	Regional
045	Bridge	Mack's Bridge	Newbridge Demesne	Regional
046	Square	The Square	Donabate	Regional
047	Gate Lodge	Newbridge House	Donabate	Local
048	Glebe House	The Vicarage	Donabate	Regional
049	Church, C of I	St Patrick's Church	Donabate	Regional
050	Graveyard	St Patrick's Church	Donabate	Regional
051	Wall Monument	St Patrick's Church	Donabate	Local
052	House	The Cottage	Donabate	Regional
053	Water Pump	Water Pump	Donabate	Regional
054	Vernacular House	Former Forge	Donabate	Regional
055	Public House	Smyth's Pub	Corballis	Regional
056	House	Prospect House	Donabate	Regional
057	Railway Station	Donabate Railway Station	Beaverstown	Regional
058	Station Master's House	Donabate Railway Station	Beaverstown	Regional
059	Signal Box	Donabate Railway Station	Beaverstown	Regional
060	Bridge	Railway Bridge	Beaverstown	Regional
061	Parish Hall	St Patrick's Hall	Beaverstown	Regional
062	Town House	An Dun	Beaverstown	Regional
063	Graveyard	Donabate Cemetery	Beaverstown	Regional
064	Church, RC	St Patrick's Church	Beaverstown	Regional
065	Vernacular House	The Cottage	Beaverstown	Regional

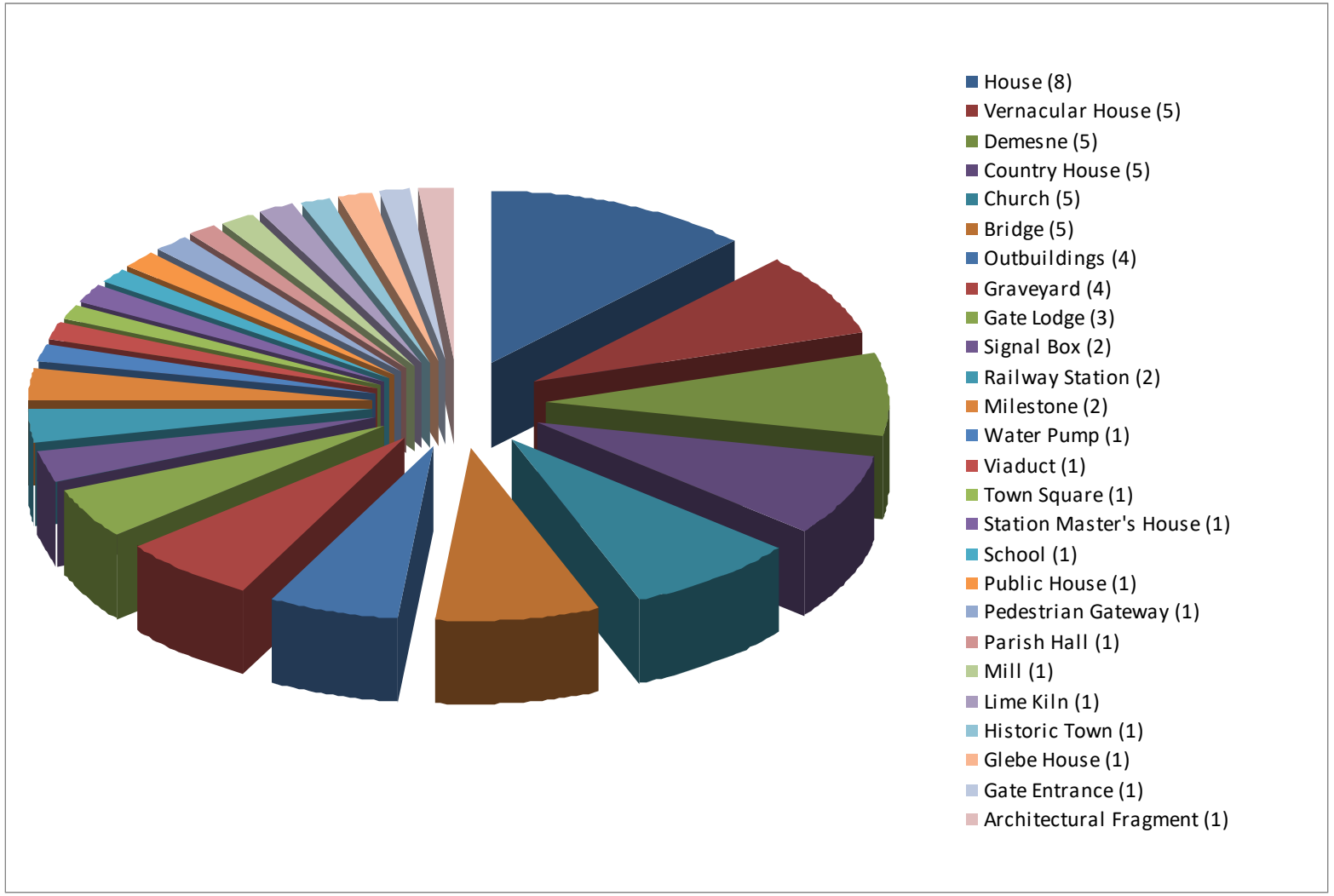
Appendix E
Distribution of Architectural Heritage Types

AHC	Easting	Northing	ITM East	ITM North	Description	Site Name	Townland	RMP	RPS	ACA	NIAH number	Statutory Protection	Nat Mon No.	P.O. No.	RHM	Key Cons-traint	Perceived Importance	Comments
1	321998.565	245420.214	721923	745444	Country House	Malahide Castle	Malahide Demesne	DU012-030----	383	N/A	11344019	RPS, RMP	None	None	None	Yes	National	Domestic
2	321838.532	245309.189	721763	745333	Demesne	Malahide Castle	Malahide Demesne, Mabestown	None	None	Yes	None	ACA	None	None	None	Yes	Regional	Domestic
3	322107.588	245431.217	722032	745455	Outbuildings	Malahide Castle	Malahide Demesne	None	383	N/A	11344021	RPS	None	None	None	Yes	Regional	Domestic
4	322112.59	245395.209	722037	745419	House	House	Malahide Demesne	None	383	N/A	11344022	RPS	None	None	None	Yes	Regional	Domestic
5	322063.579	245424.215	721988	745448	Church, undetermined	Malahide Abbey	Malahide Demesne	DU012-031001-	384	N/A	11344020	RPS, RMP	None	None	None	Yes	National	Ecclesiastical
6	322065.579	245438.218	721990	745462	Graveyard	Malahide Abbey	Malahide Demesne	DU012-031006-	384	N/A	11344020	RPS, RMP	None	None	None	Yes	National	Ecclesiastical
7	322375.64	245979.337	722300	746003	Gate Lodge	Malahide Castle	Malahide Demesne	None	383	N/A	11344023	RPS	None	None	None	Yes	Regional	Domestic
8	321452.449	245484.224	721377	745508	Gate Lodge	Malahide Castle	Malahide Demesne	None	383	N/A	11344044	RPS	None	None	None	Yes	Regional	Domestic
9	321134.38	245609.249	721059	745633	Lime Kiln	Lime Kiln	Malahide Demesne	None	382	N/A	None	RPS	None	None	None	Yes	Regional	Industrial
10	320955.346	245174.154	720880	745198	Country House	Auburn House	Auburn	None	448	N/A	None	RPS	None	None	None	Yes	Regional	Domestic
11	321015.358	245216.163	720940	745240	Demesne	Auburn House	Auburn	None	None	N/A	None	None	None	None	None	Yes	Regional	Domestic
12	320930.341	245179.155	720855	745203	Outbuildings	Auburn House	Auburn	None	448	N/A	None	RPS	None	None	None	Yes	Regional	Domestic
13	321316.424	245056.131	721241	745080	Milestone	Milestone	Auburn	None	447	N/A	11344043	RPS	None	None	None	No	Regional	Industrial
14	321208.388	246287.396	721133	746311	Mill, Cotton	Unnamed	Yellow Walls	None	None	N/A	None	None	None	None	None	No	Local	Industrial
15	321430.436	246252.39	721355	746276	House	Unnamed	Yellow Walls	None	None	N/A	None	None	None	None	None	No	Local	Domestic
16	321485.447	246345.411	721410	746369	Vernacular House	Unnamed	Yellow Walls	None	380	N/A	None	RPS	None	None	None	Yes	Regional	Domestic
17	322613.692	245849.311	722538	745873	Town House	Tír na nÓg	Malahide	None	436	N/A	None	RPS	None	None	None	Yes	Regional	Domestic
18	322712.71	246081.362	722637	746105	Historic Town	Malahide Historic Core	Malahide	None	None	Yes	None	None	None	None	None	Yes	Regional	Public

AHC	Easting	Northing	ITM East	ITM North	Description	Site Name	Townland	RMP	RPS	ACA	NIAH number	Statutory Protection	Nat Mon No.	P.O. No.	RHM	Key Cons-traint	Perceived Importance	Comments
19	322525.671	246072.358	722450	746096	Railway Station	Malahide Railway Station	Malahide	None	388	N/A	11344008	RPS	None	None	None	Yes	Regional	Industrial
20	322505.665	246150.375	722430	746174	Signal Box	Malahide Railway Station	Malahide	None	None	N/A	11344009	None	None	None	None	Yes	Regional	Industrial
21	322500.666	246026.348	722425	746050	Pedestrian Gateway	Malahide Railway Station	Malahide	None	None	N/A	11344041	None	None	None	None	Yes	Regional	Industrial
22	322525.669	246240.395	722450	746264	Bridge	Railway Bridge	Malahide	None	423	N/A	11344015	RPS	None	None	None	Yes	Regional	Industrial
23	322565.67	246954.55	722490	746978	Viaduct	Malahide Railway Viaduct	Malahide	None	420	N/A	None	RPS	None	None	None	Yes	Regional	Industrial
24	322401.644	246068.357	722326	746092	Vernacular House	Casino	Malahide	None	381	N/A	11344016	RPS	None	None	None	Yes	Regional	Domestic
25	322380.641	245996.341	722305	746020	Milestone	Milestone	Malahide	None	386	N/A	11344038	RPS	None	None	None	No	Regional	Industrial
26	322338.631	246023.347	722263	746047	Church, Presbyterian	Malahide Presbyterian Church	Malahide	None	426	N/A	None	RPS	None	None	None	Yes	Regional	Ecclesiastical
27	322254.614	246006.342	722179	746030	Town House	Sonas	Malahide	None	425	N/A	None	RPS	None	None	None	Yes	Regional	Domestic
28	322264.616	246006.342	722189	746030	Town House	Rosca	Malahide	None	424	N/A	None	RPS	None	None	None	Yes	Regional	Domestic
29	322075.576	245931.325	722000	745955	School	Malahide School	Malahide	None	None	N/A	11344018	None	None	None	None	Yes	Regional	Public
30	322170.592	246390.425	722095	746414	Vernacular House	Unnamed	Malahide	None	381	N/A	11344045	RPS	None	None	None	Yes	Regional	Domestic
31	322661.674	248496.884	722586	748520	Bridge	Railway Bridge	Kilcrea	None	502	N/A	11336027	RPS	None	None	None	Yes	Regional	Industrial
32	321747.477	248816.947	721672	748840	Church, undetermined	Kilcrea Church	Kilcrea	DU012-016001-	499	N/A	None	RPS, RMP	None	None	None	Yes	Regional	Ecclesiastical
33	321751.478	248807.945	721676	748831	Graveyard	Kilcrea Cemetery	Kilcrea	DU012-016002-	499	N/A	None	RPS, RMP	None	None	None	Yes	Regional	Ecclesiastical
34	321838.497	248704.923	721763	748728	Country House	Kilcrea House	Kilcrea	None	500	N/A	11336025	RPS	None	None	None	Yes	Regional	Domestic
35	321761.481	248650.911	721686	748674	Informal Demesne	Kilcrea House	Kilcrea	None	None	N/A	None	None	None	None	None	Yes	Local	Domestic
36	322289.593	248653.915	722214	748677	Mill, Tidal	Baltray Corn Mill	Kilcrea	DU012-018----	501	N/A	None	RPS, RMP	None	None	None	Yes	Local	Industrial
37	321211.367	248438.862	721136	748462	Country House	Seafield	Ballymadrough	None	483	N/A	11336024	RPS	None	None	None	Yes	National	Domestic

AHC	Easting	Northing	ITM East	ITM North	Description	Site Name	Townland	RMP	RPS	ACA	NIAH number	Statutory Protection	Nat Mon No.	P.O. No.	RHM	Key Cons-traint	Perceived Importance	Comments
38	321146.352	248576.891	721071	748600	Demesne	Seafield	Ballymadrough	None	None	N/A	None	None	None	None	None	Yes	Regional	Domestic
39	321160.356	248455.865	721085	748479	Outbuildings	Seafield	Ballymadrough	None	483	N/A	11336023	RPS	None	None	None	Yes	National	Domestic
40	321661.446	250038.211	721586	750061	Country House	Newbridge House	Newbridge Demesne	DU012-060----	494	N/A	11329001	RPS, RMP	None	None	None	Yes	National	Domestic
41	321689.453	249926.187	721614	749949	Demesne	Newbridge House	Newbridge Demesne	None	None	Yes	None	ACA	None	None	None	Yes	Regional	Domestic
42	321620.437	250078.219	721545	750101	Outbuildings	Newbridge House	Newbridge Demesne	None	494	N/A	11329002	RPS	None	None	None	Yes	Regional	Domestic
43	321320.375	249852.168	721245	749875	Bridge	Bridge	Newbridge Demesne	None	None	N/A	11336005	None	None	None	None	Yes	Regional	Industrial
44	322044.534	249370.069	721969	749393	Gate Entrance	Newbridge House	Newbridge Demesne	None	494	N/A	11336002	RPS	None	None	None	Yes	Regional	Domestic
45	322032.531	249418.079	721957	749441	Bridge	Mack's Bridge	Newbridge Demesne	None	None	N/A	11336004	None	None	None	None	Yes	Regional	Industrial
46	322488.622	249927.192	722413	749950	Square	The Square	Donabate	None	None	Yes	None	ACA	None	None	None	Yes	Regional	Public
47	322380.6	249876.18	722305	749899	Gate Lodge	Newbridge House	Donabate	None	495	N/A	None	RPS	None	None	None	Yes	Local	Domestic
48	322417.606	250034.215	722342	750057	Glebe House	The Vicarage	Donabate	None	None	N/A	11329005	None	None	None	None	Yes	Regional	Ecclesiastical
49	322560.637	249959.199	722485	749982	Church, C of I	St Patrick's Church	Donabate	DU012-005001-	508	N/A	11336013	RPS, RMP	None	None	None	Yes	Regional	Ecclesiastical
50	322548.635	249970.202	722473	749993	Graveyard	St Patrick's Church	Donabate	DU012-005003-	None	N/A	None	RMP	None	None	None	Yes	Regional	Ecclesiastical
51	322550.635	249955.198	722475	749978	Wall Monument	St Patrick's Church	Donabate	DU012-005004-	None	N/A	None	RMP	None	None	None	Yes	Local	Ecclesiastical
52	322578.642	249902.187	722503	749925	House	The Cottage	Donabate	None	506	N/A	11336011	RPS	None	None	None	Yes	Regional	Domestic
53	322589.644	249923.192	722514	749946	Water Pump	Water Pump	Donabate	None	507	N/A	11336001	RPS	None	None	None	Yes	Regional	Public
54	322272.581	249475.093	722197	749498	Vernacular House	Former Forge	Donabate	None	505	N/A	11336026	RPS	None	None	None	Yes	Regional	Public
55	322773.683	249922.193	722698	749945	Public House	Smyth's Pub	Corballis	None	509	N/A	11336022	RPS	None	None	None	Yes	Regional	Public
56	322702.669	249847.176	722627	749870	House	Prospect House	Donabate	None	None	N/A	None	None	None	None	None	Yes	Regional	Domestic
57	322762.68	249978.205	722687	750001	Railway Station	Donabate Railway Station	Beaverstown	None	511	N/A	11336015	RPS	None	None	None	Yes	Regional	Industrial
58	322762.68	249962.201	722687	749985	Station Master's House	Donabate Railway Station	Beaverstown	None	510	N/A	11336018	RPS	None	None	None	Yes	Regional	Industrial

AHC	Easting	Northing	ITM East	ITM North	Description	Site Name	Townland	RMP	RPS	ACA	NIAH number	Statutory Protection	Nat Mon No.	P.O. No.	RHM	Key Cons-traint	Perceived Importance	Comments
59	322746.676	250021.214	722671	750044	Signal Box	Donabate Railway Station	Beaverstown	None	511	N/A	11329011	None	None	None	None	Yes	Regional	Industrial
60	322749.678	249938.196	722677	749962	Bridge	Railway Bridge	Beaverstown	None	None	N/A	11336014	None	None	None	None	Yes	Regional	Industrial
61	322859.7	249993.209	722784	750016	Parish Hall	St Patrick's Hall	Beaverstown	None	None	N/A	None	None	None	None	None	Yes	Regional	Public
62	322966.722	250103.233	722891	750126	House	An Dun	Beaverstown	None	513	N/A	None	RPS	None	None	None	Yes	Regional	Domestic
63	322848.698	249961.202	722773	749984	Graveyard	Donabate Cemetery	Beaverstown	None	None	N/A	11336016	None	None	None	None	Yes	Regional	Ecclesiastical
64	322971.724	250029.217	722896	750052	Church, RC	St Patrick's Church	Beaverstown	None	512	N/A	None	RPS	None	None	None	Yes	Regional	Ecclesiastical
65	322851.695	250314.278	722776	750337	Vernacular House	The Cottage	Beaverstown	None	514	N/A	11329015	RPS	None	None	None	Yes	Regional	Domestic


House (8)
Vernacular House (5)
Demesne (5)
Country House (5)
Church (5)
Bridge (5)
Outbuildings (4)
Graveyard (4)
Gate Lodge (3)
Signal Box (2)
Railway Station (2)
Milestone (2)
Water Pump (1)
Viaduct (1)
Town Square (1)
Station Master's House (1)
School (1)
Public House (1)
Pedestrian Gateway (1)
Parish Hall (1)
Mill (1)
Lime Kiln (1)
Historic Town (1)
Glebe House (1)
Gate Entrance (1)
Architectural Fragment (1)

AHC	Description	Site Name	Townland	Key Constraint	Perceived Importance	Form
001	Country House	Malahide Castle	Malahide Demesne	Yes	National	Domestic
002	Demesne	Malahide Castle Demesne	Malahide Demesne	Yes	National	Domestic
003	Outbuildings	Malahide Castle	Malahide Demesne	Yes	Regional	Domestic
004	House	House	Malahide Demesne	Yes	Regional	Domestic
005	Church, undetermined	Malahide Abbey	Malahide Demesne	Yes	National	Ecclesiastical
006	Graveyard	Malahide Abbey	Malahide Demesne	Yes	National	Ecclesiastical
007	Gate Lodge	Malahide Castle	Malahide Demesne	Yes	Regional	Domestic
008	Gate Lodge	Malahide Castle	Malahide Demesne	Yes	Regional	Domestic
009	Lime Kiln	Lime Kiln	Malahide Demesne	Yes	Undetermined	Industrial
010	Country House	Auburn House	Auburn	Yes	Undetermined	Domestic
011	Demesne	Auburn House	Auburn	Yes	Undetermined	Domestic
012	Outbuildings	Auburn House	Auburn	Yes	Undetermined	Domestic
013	Milestone	Milestone	Auburn	Yes	Regional	Industrial
014	Mill, Cotton	Unnamed	Yellow Walls	No	Undetermined	Industrial
015	House	Unnamed	Yellow Walls	No	Local	Domestic
016	Vernacular House	Unnamed	Yellow Walls	Yes	Regional	Domestic
017	House	Tír na nÓg	Malahide	Yes	Undetermined	Domestic
018	Historic Town	Malahide Historic Core	Malahide	Yes	Regional	Public
019	Railway Station	Malahide Railway Station	Malahide	Yes	Regional	Industrial
020	Signal Box	Malahide Railway Station	Malahide	No	Regional	Industrial
021	Pedestrian Gateway	Malahide Railway Station	Malahide	No	Regional	Public
022	Bridge	Railway Bridge	Malahide	Yes	Regional	Industrial
023	Viaduct	Malahide Railway Viaduct	Malahide	Yes	Undetermined	Industrial
024	Vernacular House	Casino	Malahide	Yes	Regional	Domestic
025	Milestone	Milestone	Malahide	Yes	Regional	Industrial
026	Church, Presbyterian	Malahide Presbyterian Church	Malahide	Yes	Regional	Ecclesiastical
027	House	Sonas	Malahide	Yes	Regional	Domestic
028	House	Rosca	Malahide	Yes	Regional	Domestic
029	School	Malahide School	Malahide	Yes	Regional	Public
030	Vernacular House	Unnamed	Malahide	Yes	Regional	Domestic
031	Bridge	Railway Bridge	Kilcrea	Yes	Regional	Industrial
032	Church, undetermined	Kilcrea Church	Kilcrea	Yes	Undetermined	Ecclesiastical
033	Graveyard	Kilcrea Cemetery	Kilcrea	Yes	Undetermined	Ecclesiastical

AHC	Description	Site Name	Townland	Key Constraint	Perceived Importance	Form
034	Country House	Kilcrea House	Kilcrea	Yes	Regional	Domestic
035	Demesne	Kilcrea House	Kilcrea	Yes	Undetermined	Domestic
036	Mill, Tidal	Baltray Corn Mill	Kilcrea	Yes	Undetermined	Industrial
037	Country House	Seafield	Ballymadrough	Yes	National	Domestic
038	Demesne	Seafield	Ballymadrough	Yes	Undetermined	Domestic
039	Outbuildings	Seafield	Ballymadrough	Yes	National	Domestic
040	Country House	Newbridge House	Newbridge Demesne	Yes	National	Domestic
041	Demesne	Newbridge House Demesne	Newbridge Demesne	Yes	National	Domestic
042	Outbuildings	Newbridge House	Newbridge Demesne	Yes	Regional	Domestic
043	Bridge	Bridge	Newbridge Demesne	Yes	Regional	Domestic
044	Gate Entrance	Newbridge House	Newbridge Demesne	Yes	Regional	Domestic
045	Bridge	Mack's Bridge	Newbridge Demesne	Yes	Regional	Domestic
046	Square	The Square	Donabate	Yes	Regional	Public
047	Gate Lodge	Newbridge House	Donabate	Yes	Undetermined	Domestic
048	Glebe House	The Vicarage	Donabate	Yes	Regional	Ecclesiastical
049	Church, C of I	St Patrick's Church	Donabate	Yes	Regional	Ecclesiastical
050	Graveyard	St Patrick's Church	Donabate	Yes	Undetermined	Ecclesiastical
051	Architectural Fragment	Wall Monument	Donabate	Yes	Undetermined	Ecclesiastical
052	House	The Cottage	Donabate	Yes	Regional	Domestic
053	Water Pump	Water Pump	Donabate	Yes	Regional	Public
054	Vernacular House	Former Forge	Donabate	Yes	Regional	Public
055	Public House	Smyth's Pub	Corballis	Yes	Regional	Public
056	House	Prospect House	Donabate	TBC	Undetermined	Domestic
057	Railway Station	Donabate Railway Station	Beaverstown	Yes	Regional	Industrial
058	Station Master's House	Donabate Railway Station	Beaverstown	Yes	Regional	Industrial
059	Signal Box	Donabate Railway Station	Beaverstown	Yes	Regional	Industrial
060	Bridge	Railway Bridge	Beaverstown	Yes	Regional	Industrial
061	Parish Hall	St Patrick's Hall	Beaverstown	Yes	Undetermined	Ecclesiastical
062	House	An Dun	Beaverstown	Yes	Undetermined	Domestic
063	Graveyard	Donabate Cemetery	Beaverstown	Yes	Regional	Ecclesiastical
064	Church, RC	St Patrick's Church	Beaverstown	Yes	Regional	Ecclesiastical
065	Vernacular House	The Cottage	Beaverstown	Yes	Regional	Domestic

Appendix F
Recorded Archaeological Sites and Cultural Heritage Sites Within the Constraints Study Area

Table 1. Recorded Archaeological Sites within the Constraint Study Area.

RMP/SMR No.	Townland	Site Type	Perceived Importance
DU012-004	Newbridge Demesne	Castle-tower house	Regional
DU012-005001	Donabate	Church	Regional
DU012-005002	Donabate	Castle-tower house	Regional
DU012-005003	Donabate	Graveyard	Regional
DU012-005004	Donabate	Wall monument	Local
DU012-006	Lanestown	Enclosure	Local
DU012-014	Ballymadrough	Castle-motte	Regional
DU012-016001	Kilcrea	Church	Regional
DU012-016002	Kilcrea	Graveyard	Regional
DU012-017	Kilcrea	Enclosure	Local
DU012-018	Kilcrea	Tide mill	Local
DU012-019	Corballis	Earthwork	Regional
DU012-023001	Malahide	Ritual site-holy well	Local
DU012-023002	Malahide	Church	Regional
DU012-023003	Malahide	Earthwork	Local
DU012-029	Malahide Demesne	Earthwork	Local
DU012-030	Malahide Demesne	Castle-tower house	Regional
DU012-031001	Malahide Demesne	Church	Regional
DU012-031002	Malahide Demesne	Sheela-na-gig	Local
DU012-031003	Malahide Demesne	Sheela-na-gig	Local
DU012-031004	Malahide Demesne	Architectural fragment	Local
DU012-031005	Malahide Demesne	Chest tomb	Local
DU012-031006	Malahide Demesne	Graveyard	Regional
DU012-060	Newbridge Demesne	House-18th/19th century	Local
DU012-066	Beaverstown	Habitation site	Regional
DU012-067	Beaverstown	Enclosure	Regional
DU012-072	Kilcrea	Ring ditch	Regional
DU012-074	Newbridge Demesne	Ring ditch	Regional
DU012-082001	Donabate	Excavation Miscellaneous	Local
DU012-082002	Donabate	Structure	Local
DU012-082003	Donabate	Structure	Local
DU012-082004	Donabate	Structure	Local
DU012-083	Beaverstown	Excavation Miscellaneous	Local

Table 2. Cultural Heritage Sites within the Constraint Study Area.

CHS Number	Townland	Site Type	Perceived Importance	Distance from Route
CHS 1	Malahide, Kilcrea, Donabate	Dublin Belfast Railway	Regional	0m
CHS 2	Malahide Kilcrea	Malahide Estuary	Local	0m
CHS 3	Malahide Demesne	Malahide Demesne	Local	0m
CHS 4	Newbridge Demesne	Newbridge Demesne	Local	0m

Appendix G
Site Synopsis Sheets

Malahide Estuary SAC (Site Code 000205)

Malahide Estuary is situated immediately north of Malahide and east of Swords in Co. Dublin. It is the estuary of the River Broadmeadow. The site is divided by a railway viaduct which was built in the 1800s.

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

- [1140] Tidal Mudflats and Sandflats
- [1310] *Salicornia* Mud
- [1330] Atlantic Salt Meadows
- [1410] Mediterranean Salt Meadows
- [2120] Marram Dunes (White Dunes)
- [2130] Fixed Dunes (Grey Dunes)*

The outer part of the estuary is mostly cut off from the sea by a large sand spit, known as 'the island'. The outer estuary drains almost completely at low tide, exposing sand and mud flats. There is a large bed of Eelgrass (Dwarf Eelgrass, *Zostera noltii*, and Narrow-leaved Eelgrass, *Z. angustifolia*) in the north section of the outer estuary, along with Beaked Tasselweed (*Ruppia maritima*) and extensive mats of green algae (*Enteromorpha* spp., *Ulva lactuca*). Common Cord-grass (*Spartina anglica*) is also widespread in this sheltered part of the estuary.

The dune spit has a well-developed outer dune ridge dominated by Marram Grass (*Ammophila arenaria*). The dry areas of the stabilised dunes have a dense covering of Burnet Rose (*Rosa pimpinellifolia*), Red Fescue (*Festuca rubra*) and species such as Yellow-wort (*Blackstonia perfoliata*), Autumn Gentian (*Gentianella amarella*), Hound's-tongue (*Cynoglossum officinale*), Carline Thistle (*Carlina vulgaris*) and Pyramidal Orchid (*Anacamptis pyramidalis*). Much of the interior of the spit is taken up by a golf course. The inner stony shore has frequent Sea-holly (*Eryngium maritimum*). Well- developed saltmarshes occur at the tip of the spit. Atlantic salt meadow is the principal type and is characterised by species such as Sea-purslane (*Halimoine portulacoides*), Sea Aster (*Aster tripolium*), Thrift (*Armeria maritima*), Sea Arrowgrass (*Triglochin maritima*) and Common Saltmarsh-grass (*Puccinellia maritima*). Elsewhere in the outer estuary, a small area of Mediterranean salt meadow occurs which is characterised by the presence of Sea Rush (*Juncus maritimus*). Below the salt marshes there are good examples of pioneering glasswort (*Salicornia* spp.) swards and other annual species, typified by *S. dolichostachya* and Annual Sea-blite (*Suaeda maritima*).

The inner estuary does not drain at low tide apart from the extreme inner part. Here, patches of saltmarsh and salt meadows occur, with Sea Aster, Sea Plantain (*Plantago maritima*) and Sea Club-rush (*Scirpus maritimus*). Beaked Tasselweed occurs in one of the channels.

The site includes a fine area of rocky shore south-east of Malahide and extending towards Portmarnock. This represents the only continuous section through the fossiliferous Lower Carboniferous rocks in the Dublin Basin, and is the type locality for several species of fossil coral.

The estuary is an important wintering bird site and holds an internationally important population of Brent Goose and nationally important populations of a further 15 species. Average maximum counts during the 1995/96-1997/98 period were: Brent Goose 1217; Great Crested Grebe 52; Mute Swan 106; Shelduck 471; Pochard 200; Goldeneye 333; Red-breasted Merganser 116; Oystercatcher 1228; Golden Plover 2123; Grey Plover 190; Redshank 454; Wigeon 50; Teal 78; Ringed Plover 106; Knot 858; Dunlin 1474; Greenshank 38; Pintail 53; Black-tailed Godwit 345; Bar-tailed Godwit 99. The high numbers of diving birds reflects the lagoon-type nature of the inner estuary.

The estuary also attracts migrant species such as Ruff, Curlew Sandpiper, Spotted Redshank and Little Stint. Breeding birds of the site include Ringed Plover, Shelduck and Mallard. Up to the 1950s there was a major tern colony at the southern end of the island and the habitat remains suitable for these birds.

The inner part of the estuary is heavily used for water sports. A section of the outer estuary has recently been infilled for a marina and housing development.

This site is a fine example of an estuarine system with all the main habitats represented. The site is important ornithologically, with a population of Brent Goose of international significance.

26.05.2017

Malahide Estuary SPA (Site Code 004025)

Malahide Estuary is situated in north Co. Dublin, between the towns of Malahide and Swords. The site encompasses the estuary, saltmarsh habitats and shallow subtidal areas at the mouth of the estuary. A railway viaduct, built in the 1800s, crosses the site and has led to the inner estuary becoming lagoonal in character and only partly tidal. Much of the outer part of the estuary is well-sheltered from the sea by a large sand spit, known as "The Island". This spit is now mostly converted to golf-course. The outer part empties almost completely at low tide and there are extensive intertidal flats exposed. Substantial stands of eelgrass (both *Zostera noltii* and *Z. angustifolia*) occur in the sheltered part of the outer estuary, along with Tasselweed (*Ruppia maritima*). Green algae, mostly *Ulva* spp., are frequent on the sheltered flats. Common Cord-grass (*Spartina anglica*) is well established in the outer estuary and also in the innermost part of the site. The intertidal flats support a typical macroinvertebrate fauna, with polychaete worms (*Arenicola marina* and *Hediste diversicolor*), bivalves such as *Cerastoderma edule*, *Macoma balthica* and *Scrobicularia plana*, the small gastropod *Hydrobia ulvae* and the crustacean *Corophium volutator*. Salt marshes, which provide important roosts during high tide, occur in parts of the outer estuary and in the extreme inner part of the inner estuary. These are characterised by such species as Sea Purslane (*Halimione portulacoides*), Sea Aster (*Aster tripolium*), Thrift (*Armeria maritima*), Sea Arrowgrass (*Triglochin maritima*) and Common Saltmarsh-grass (*Puccinellia maritima*).

The site is a Special Protection Area (SPA) under the EU Birds Directive, of special conservation interest for the following species: Great Crested Grebe, Light-bellied Brent Goose, Shelduck, Pintail, Goldeneye, Red-breasted Merganser, Oystercatcher, Golden Plover, Grey Plover, Knot, Dunlin, Black-tailed Godwit, Bar-tailed Godwit and Redshank. The EU Birds Directive pays particular attention to wetlands and, as these form part of this SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds.

This site is of high importance for wintering waterfowl and supports a particularly good diversity of species. It has internationally important populations of Lightbellied Brent Goose (1,104 individuals or 5% of the all-Ireland total) and Black-tailed Godwit (409 individuals or 2.9% of the all-

Ireland total) - figures given here and below are mean peaks for the five winters 1995/96-1999/2000. Furthermore, the site supports nationally important populations of an additional 12 species: Great Crested Grebe (63), Shelduck (439), Pintail (58), Goldeneye (215), Red-breasted Merganser (99), Oystercatcher (1,360), Golden Plover (1,843), Grey Plover (201), Knot (915), Dunlin (1,594), Bar-tailed Godwit (156) and Redshank (581). The high numbers of diving ducks reflects the lagoon-type nature of the inner estuary, and this is one of the few sites in eastern Ireland where substantial numbers of Goldeneye can be found.

A range of other species occurs, including Mute Swan (37), Pochard (36), Ringed Plover (86), Lapwing (1,542), Curlew (548), Greenshank (38) and Turnstone (112). The estuary also attracts other migrant wader species such as Ruff, Curlew Sandpiper, Spotted Redshank and Little Stint. These occur mainly in autumn, though occasionally in spring and winter.

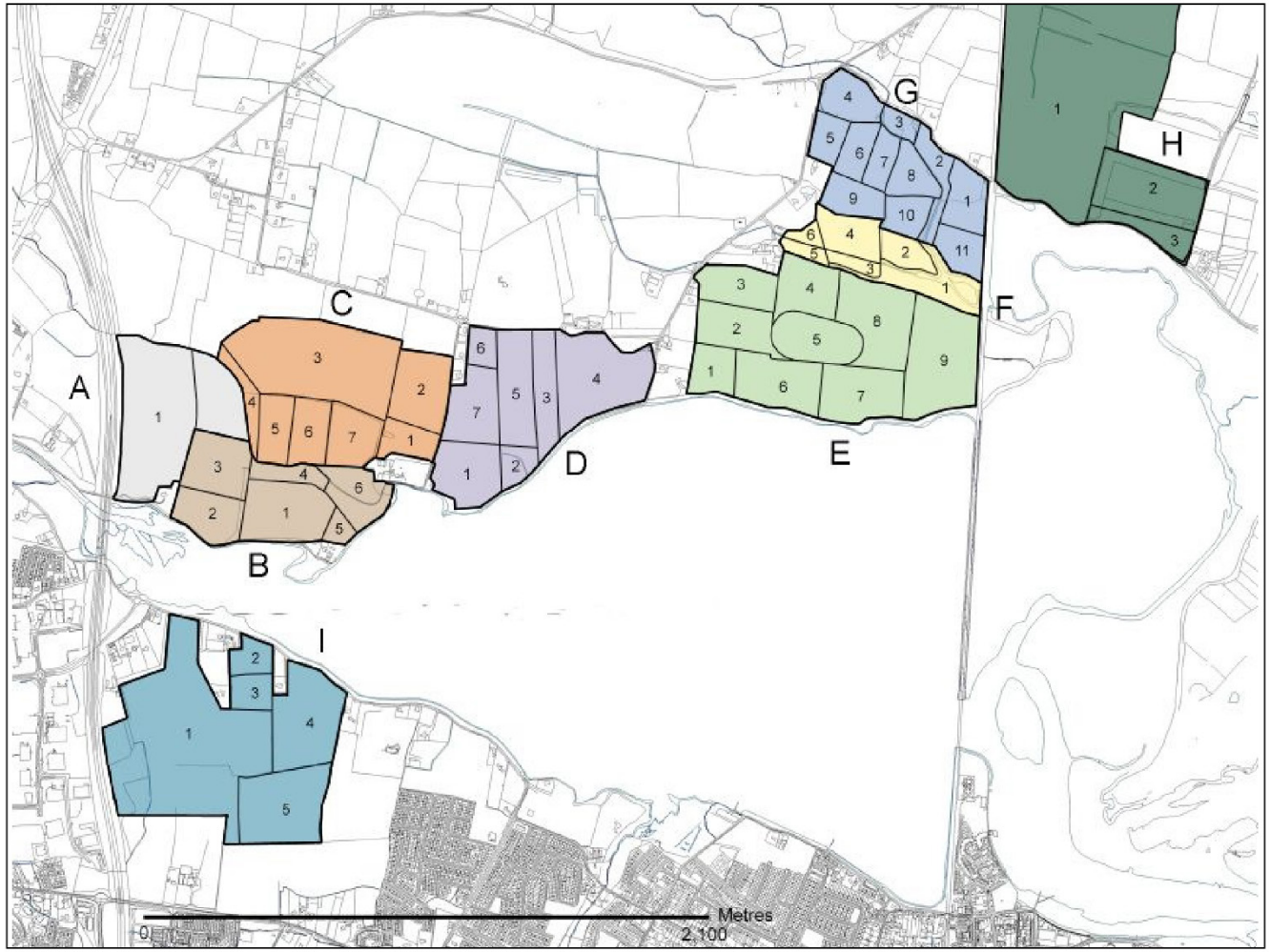
Breeding birds of the site include Ringed Plover, Shelduck and Mallard. Up to the 1950s there was a major tern colony at the southern end of Malahide Island. Grey Herons breed nearby and feed regularly within the site.

Malahide Estuary SPA is a fine example of an estuarine system, providing both feeding and roosting areas for a range of wintering waterfowl. The lagoonal nature of the inner estuary is of particular value as it increases the diversity of birds which occur. The site is of high conservation importance, with internationally important populations of Light-bellied Brent Goose and Black-tailed Godwit, and nationally important populations of a further 12 species. Two of the species which occur regularly (Golden Plover and Bar-tailed Godwit) are listed on Annex I of the EU Birds Directive. Malahide Estuary (also known as Broadmeadow Estuary) is a Ramsar Convention site.

23.08.2013

Appendix H

Map of the Survey Sections at Lands Surrounding the Broadmeadow/Swords Estuary (from Roe & Lovatt, 2009)



Appendix I
Glossary of Acoustic Terminology

Ambient noise The totally encompassing sound in a given situation at a given time, usually composed of sound from many sources, near and far.

Background noise The steady existing noise level present without contribution from any intermittent sources. The A-weighted sound pressure level of the residual noise at the assessment position that is exceeded for 90 per cent of a given time interval, T ($L_{AF90,T}$).

dB Decibel - The scale in which sound pressure level is expressed. It is defined as 20 times the logarithm of the ratio between the RMS pressure of the sound field and the reference pressure of 20 micro-pascals (20μPa).

$L_{Aeq,T}$ This is the equivalent continuous sound level. It is a type of average and is used to describe a fluctuating noise in terms of a single noise level over the sample period (T).The closer the L_{Aeq} value is to either the L_{AF10} or L_{AF90} value indicates the relative impact of the intermittent sources and their contribution. The relative spread between the values determines the impact of intermittent sources, such as traffic, on the background.

L_{AF90} Refers to those A-weighted noise levels in the lower 90 percentile of the sampling interval; it is the level which is exceeded for 90% of the measurement period. It will therefore exclude the intermittent features of traffic and is used to describe a background level. Measured using the "Fast" time weighting.

L_{den} Is the 24 hour noise rating level determined by the averaging of the L_{day} with the $L_{evening}$ plus a 5 dB penalty and the L_{night} plus a 10 dB penalty. L_{den} is calculated using the following formula:

$$L_{\text{den}} = 10log\left(\frac{1}{24}\right)\left(12 * \left(10^{\frac{Lday}{10}}\right) + 4 * \left(10^{\frac{Levening+5}{10}}\right) + 8 * \left(10^{\frac{Lnight+10}{10}}\right)\right)$$

Where:
L_{day} is the A-weighted long-term average sound level as defined in ISO 1996-2, determined over all the day periods of a year;
$L_{evening}$ is the A-weighted long-term average sound level as defined in ISO 1996-2, determined over all the evening periods of a year and;
L_{night} is the A-weighted long-term average sound level as defined in ISO 1996-2, determined over all the night periods of a year.

Appendix J

Constraints Report – Figures

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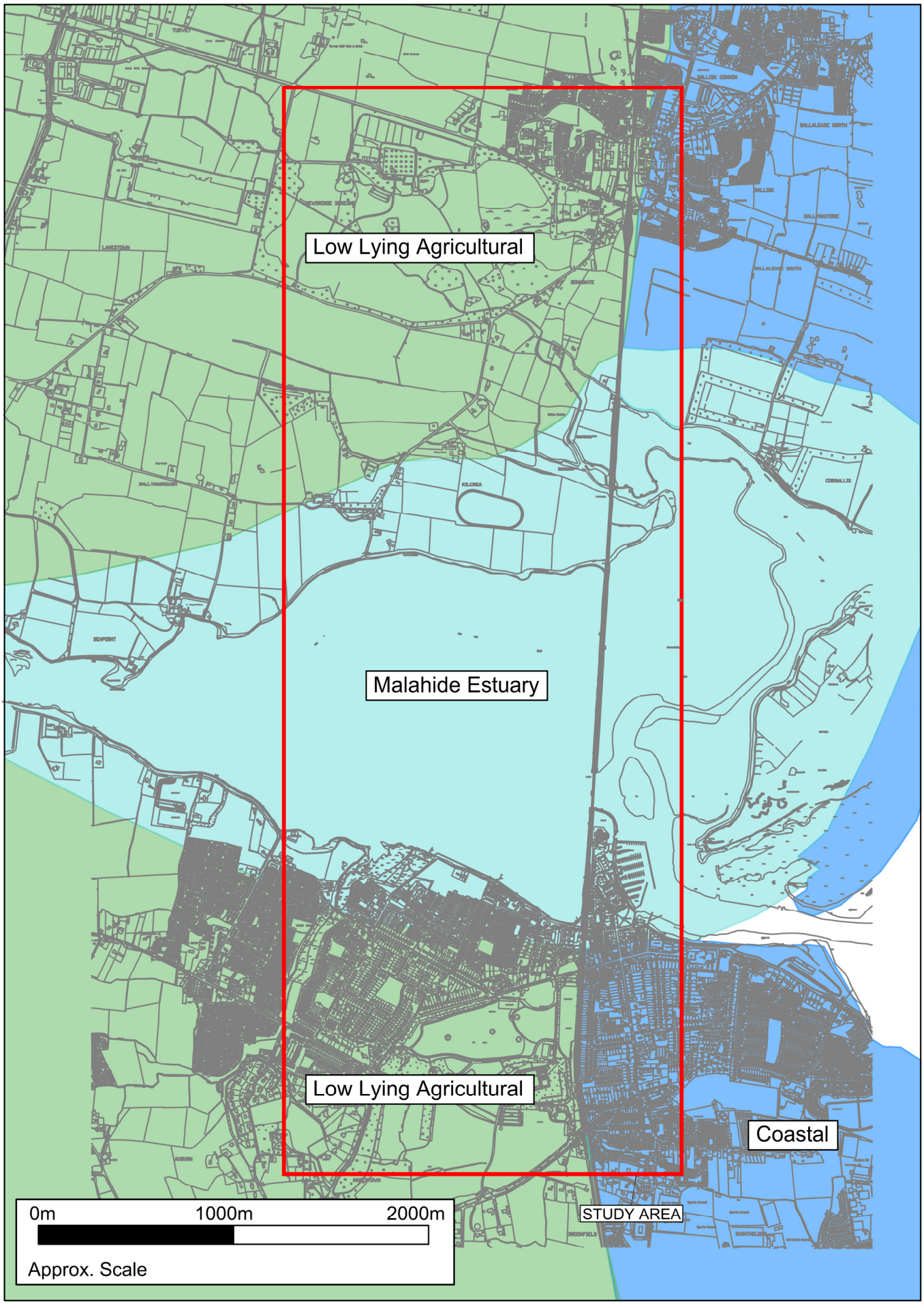
Broadmeadow Way Constraints Report: Figure 1
Study Area



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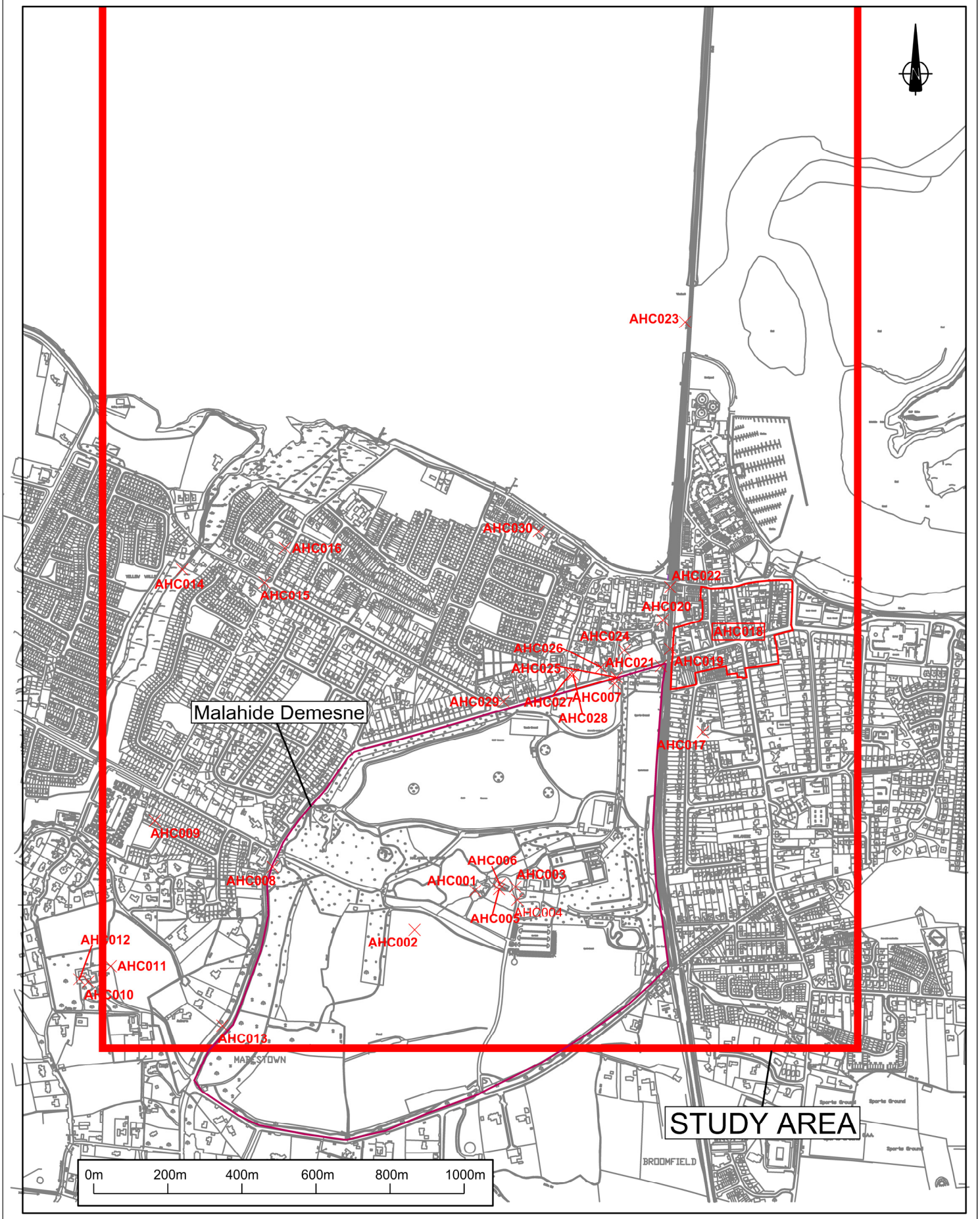
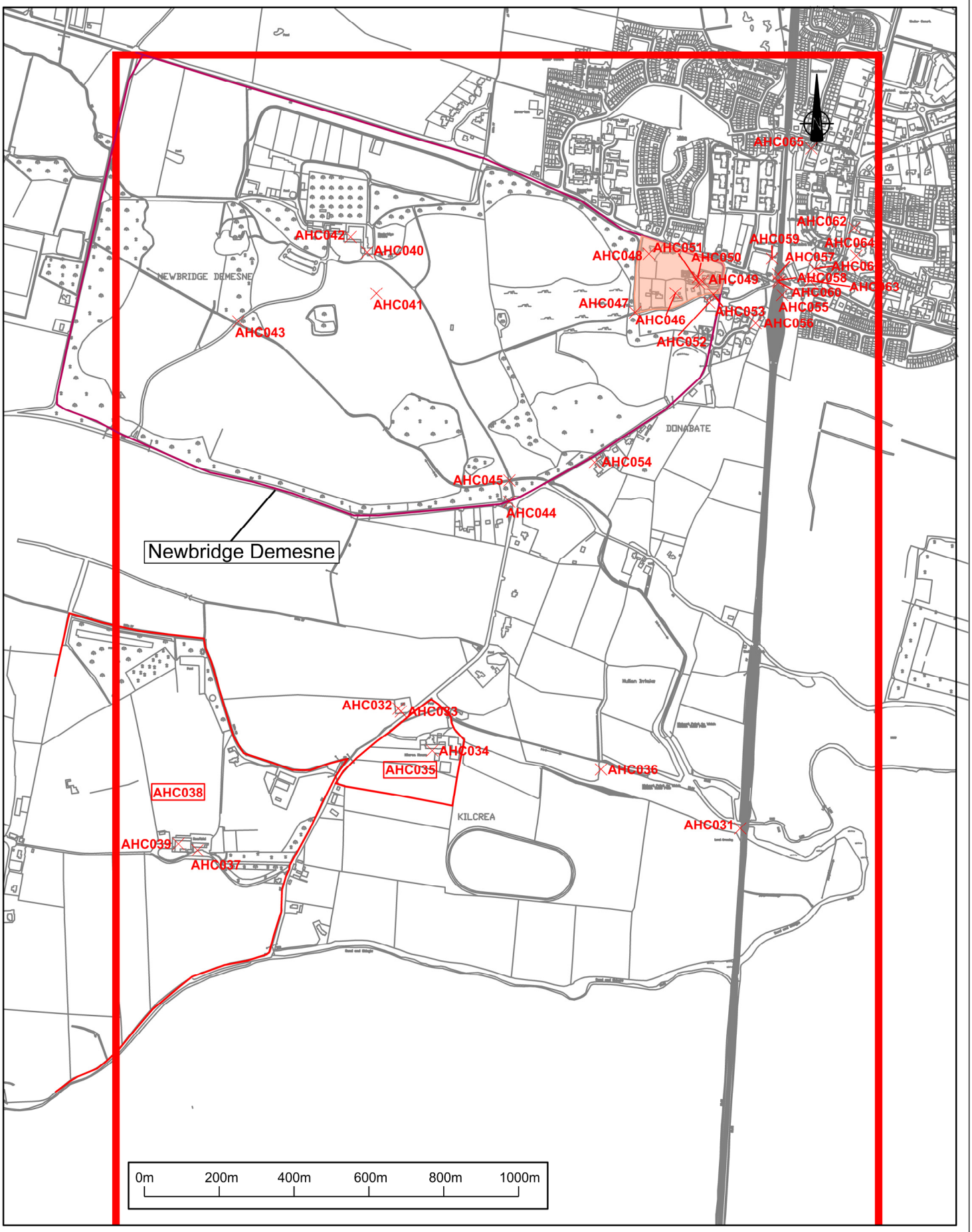
Broadmeadow Way Constraints Report: Figure 2
Landscape Character Zones



Creagh House Environmental

Broadmeadow Way Constraints Report: Figure 3
Architectural Heritage at Malahide



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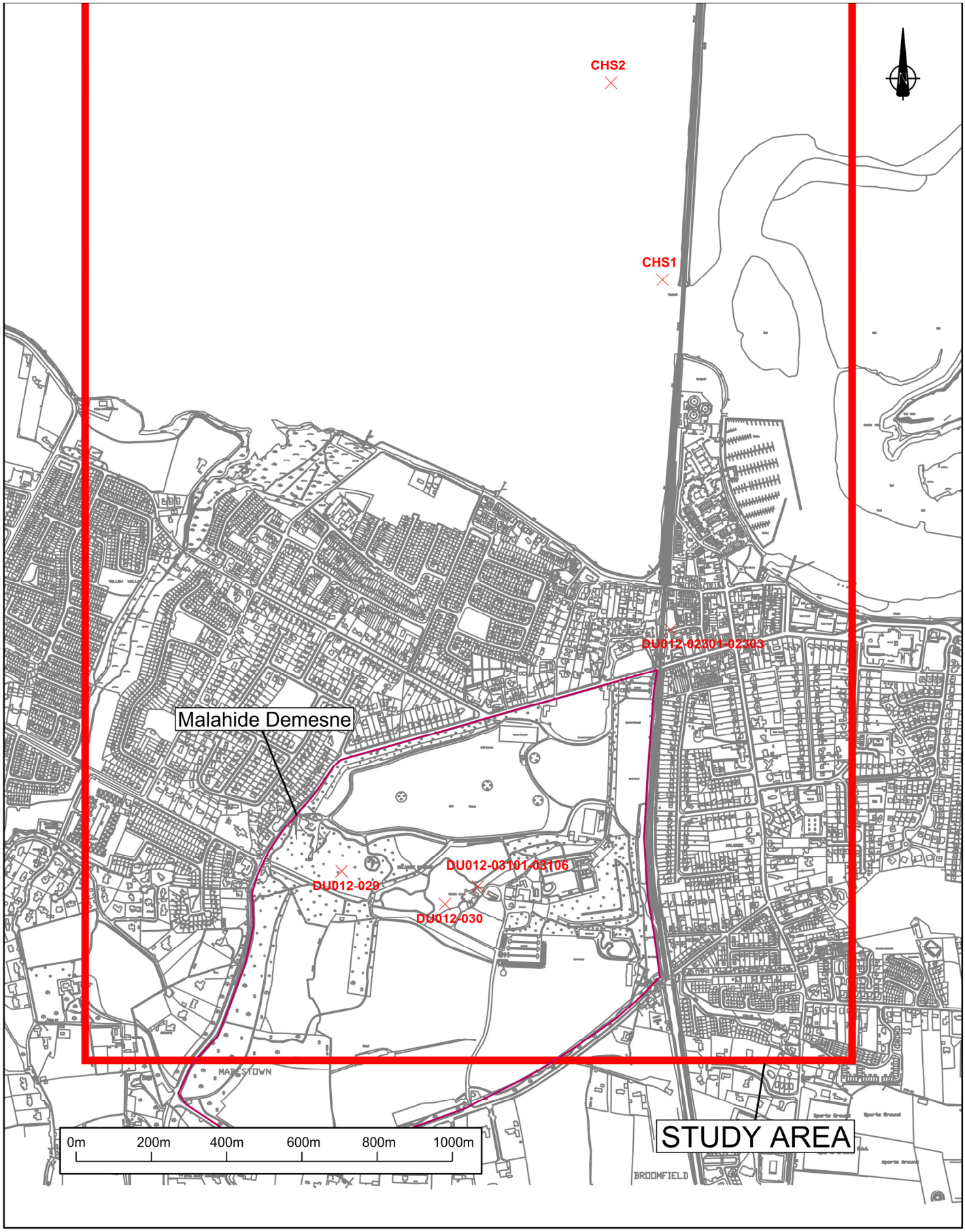
Broadmeadow Way Constraints Report: Figure 4
Architectural Heritage at Kilcrea



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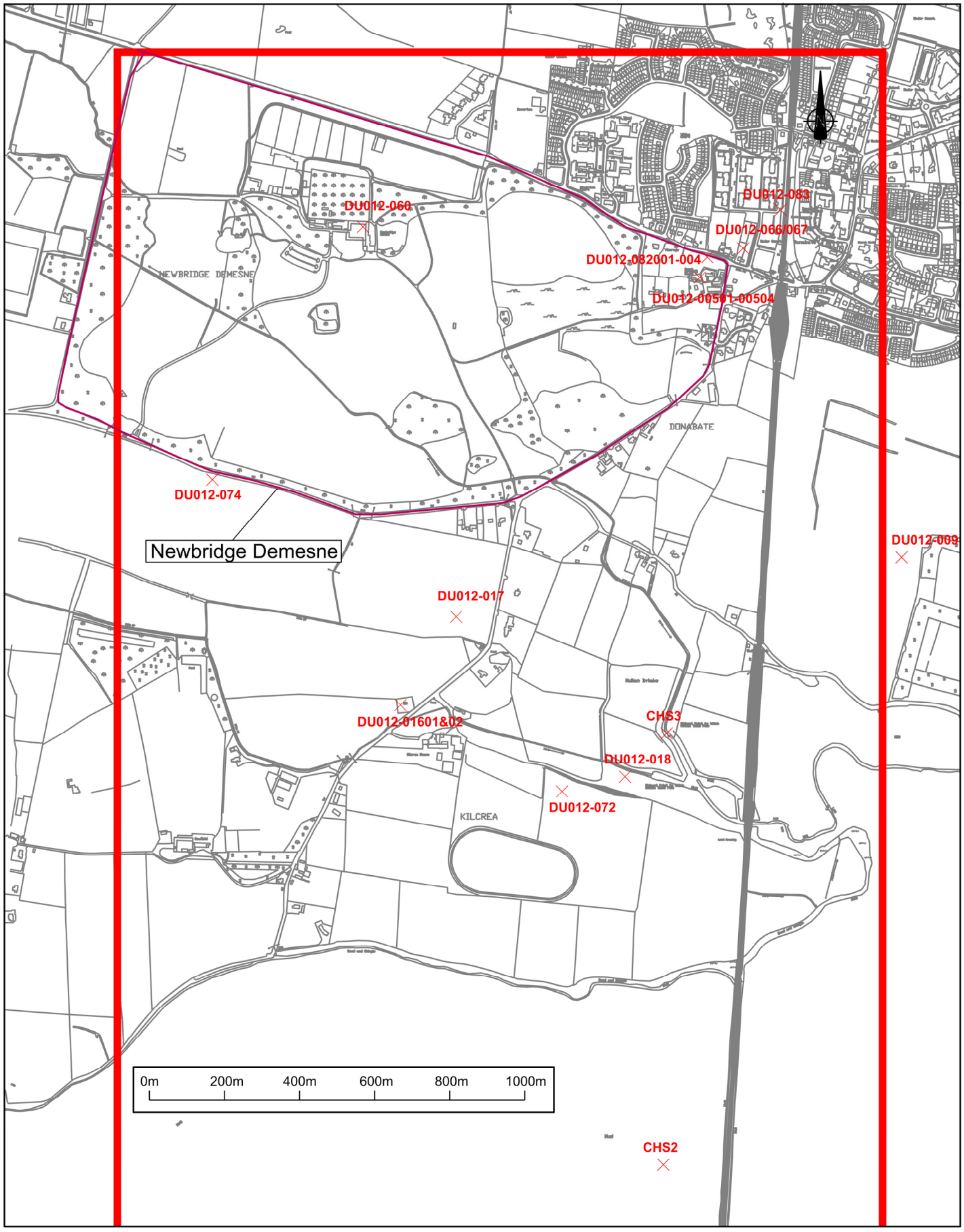
Broadmeadow Way Constraints Report: Figure 5
Archaeology at Malahide



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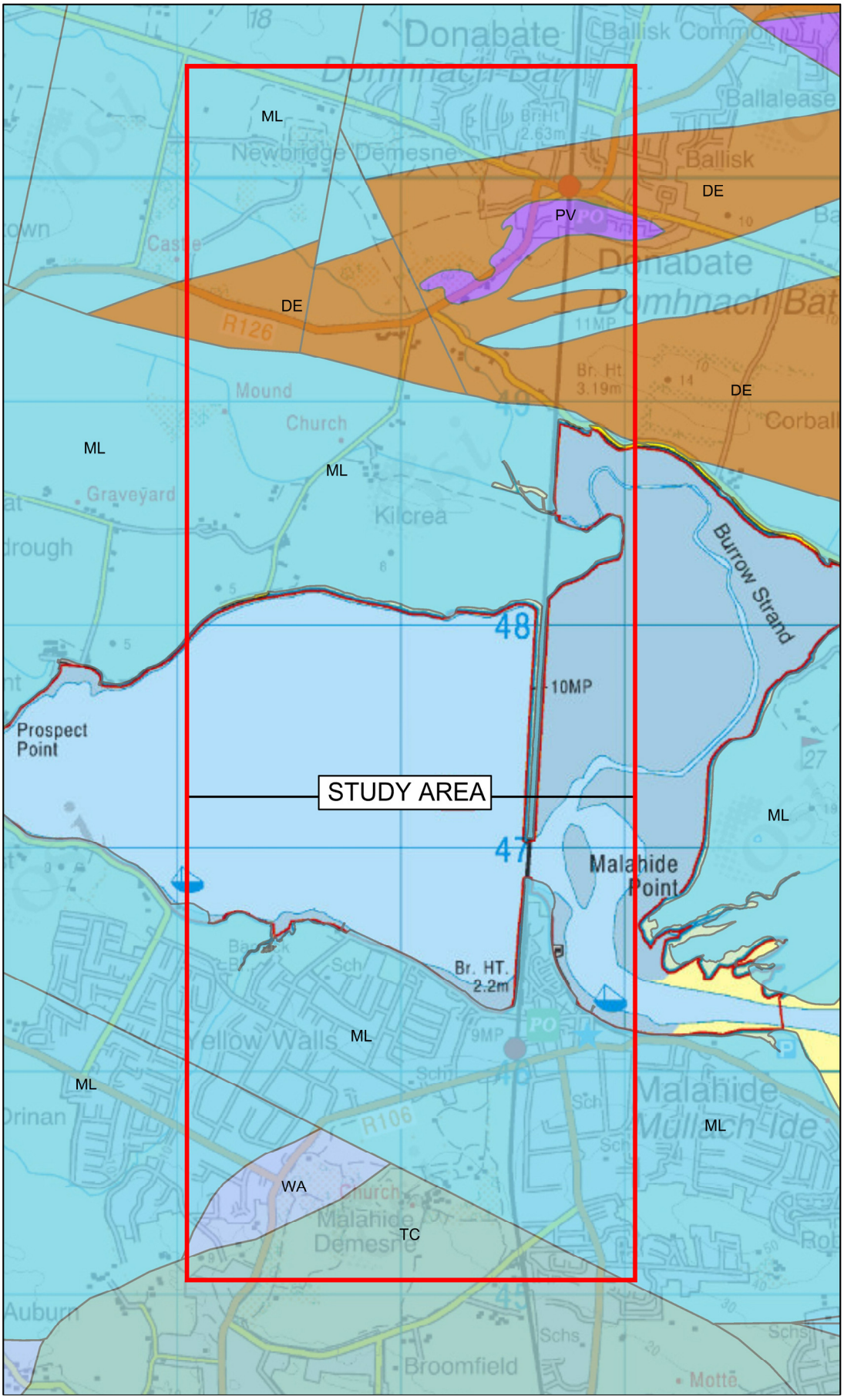
Broadmeadow Way Constraints Report: Figure 6
Archaeology at Kilcrea



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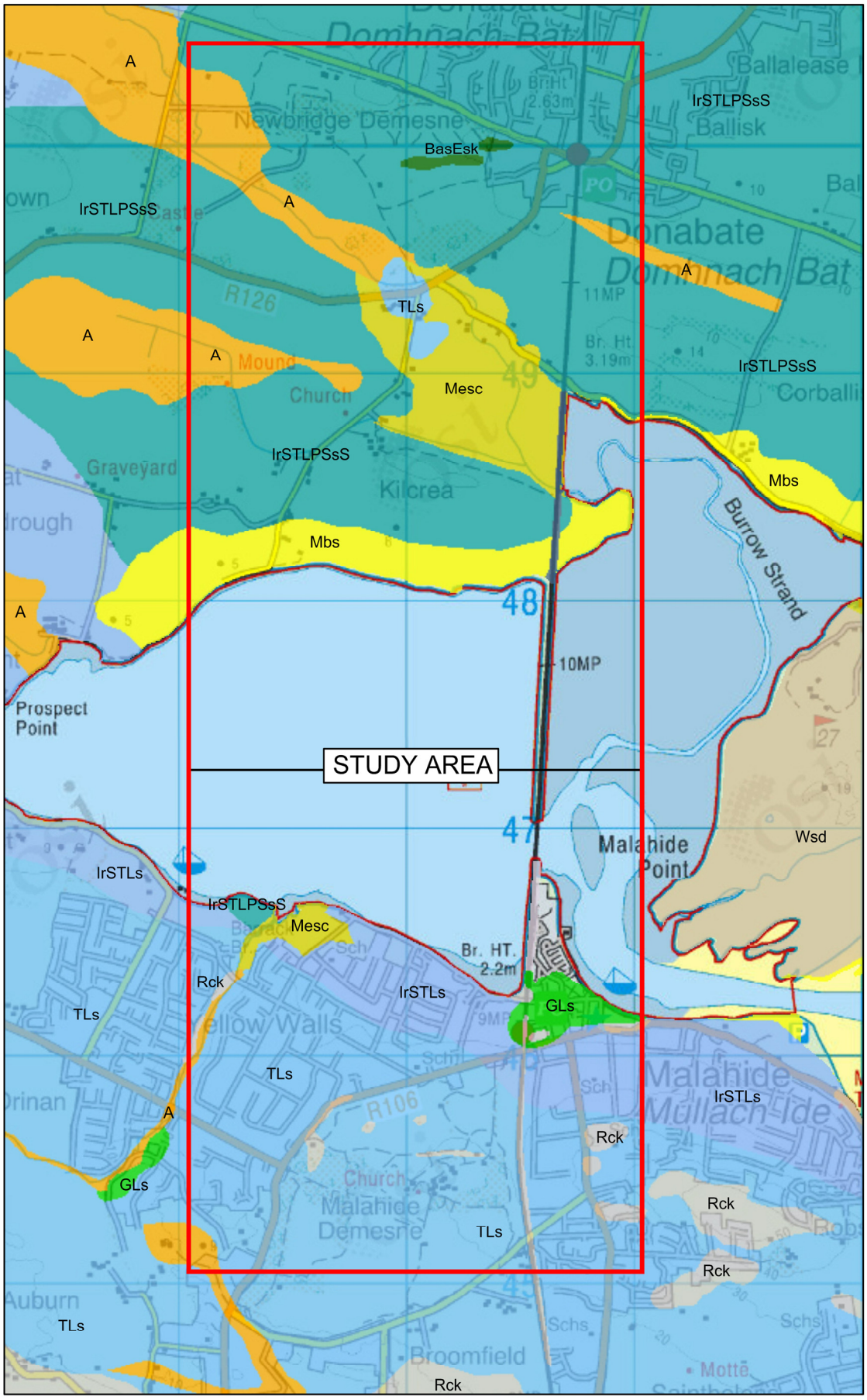
Broadmeadow Way Constraints Report: Figure 7
Solid Bedrock



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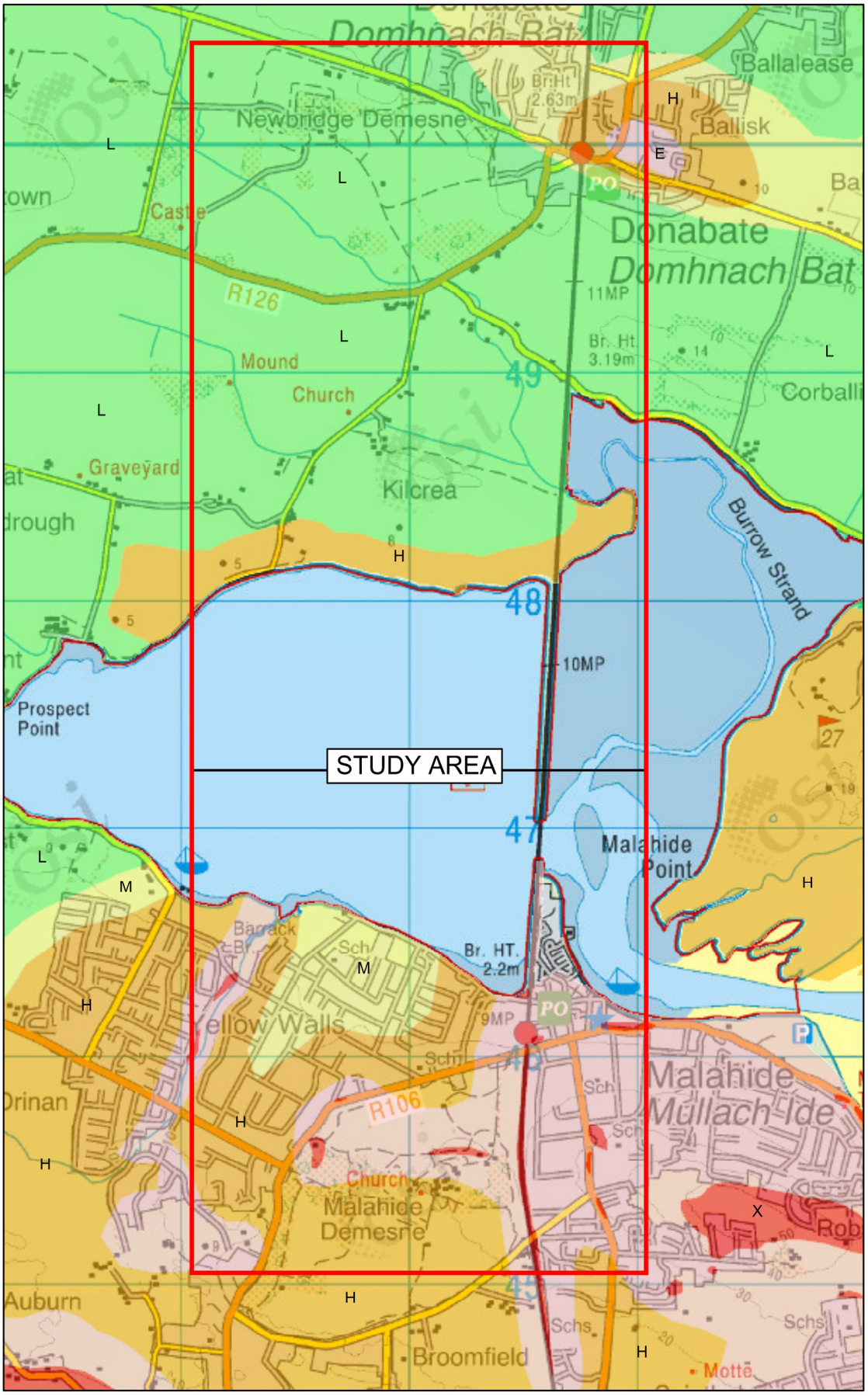
Broadmeadow Way Constraints Report: Figure 8 Subsoils



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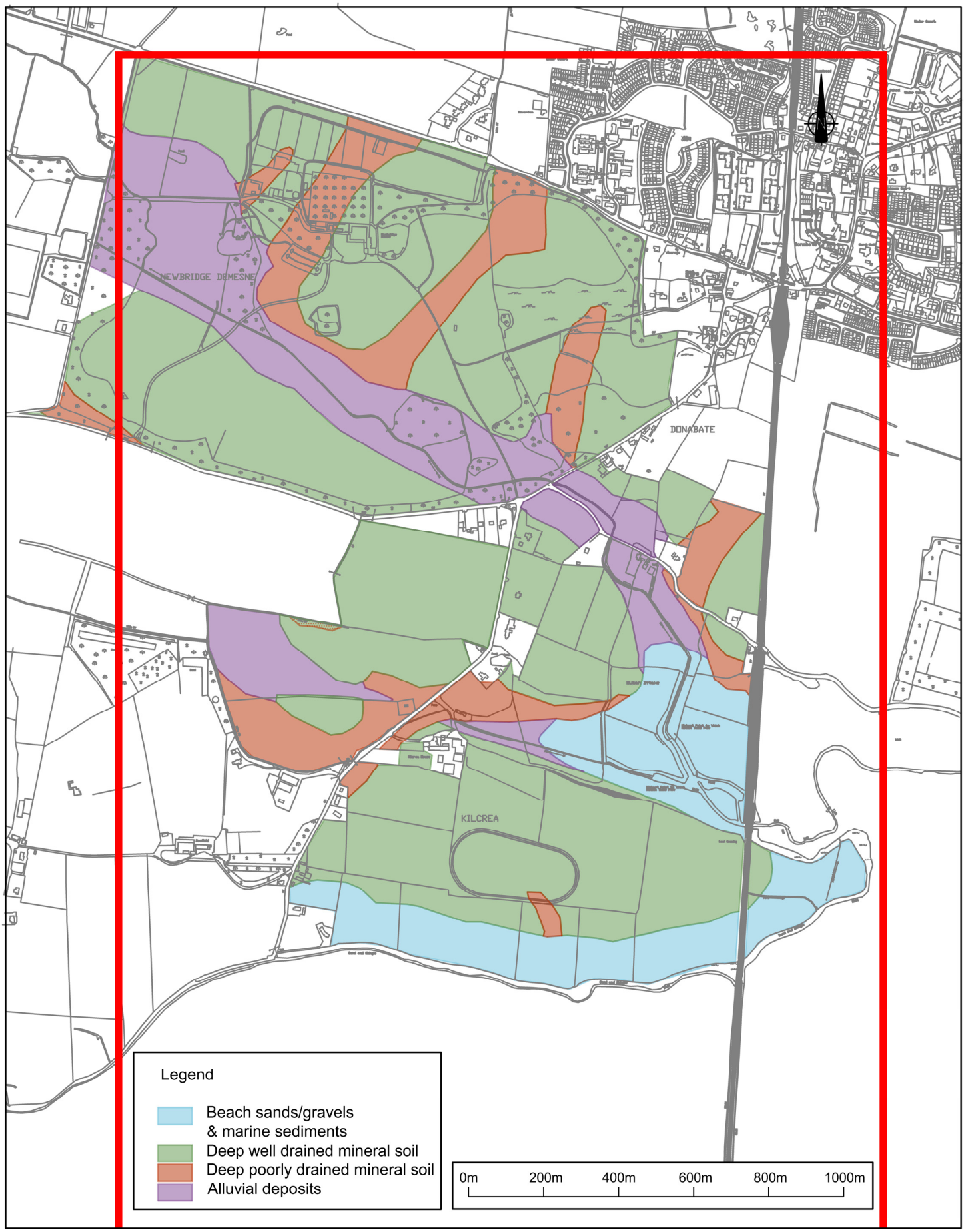
Broadmeadow Way Constraints Report: Figure 9
Groundwater Vulnerability



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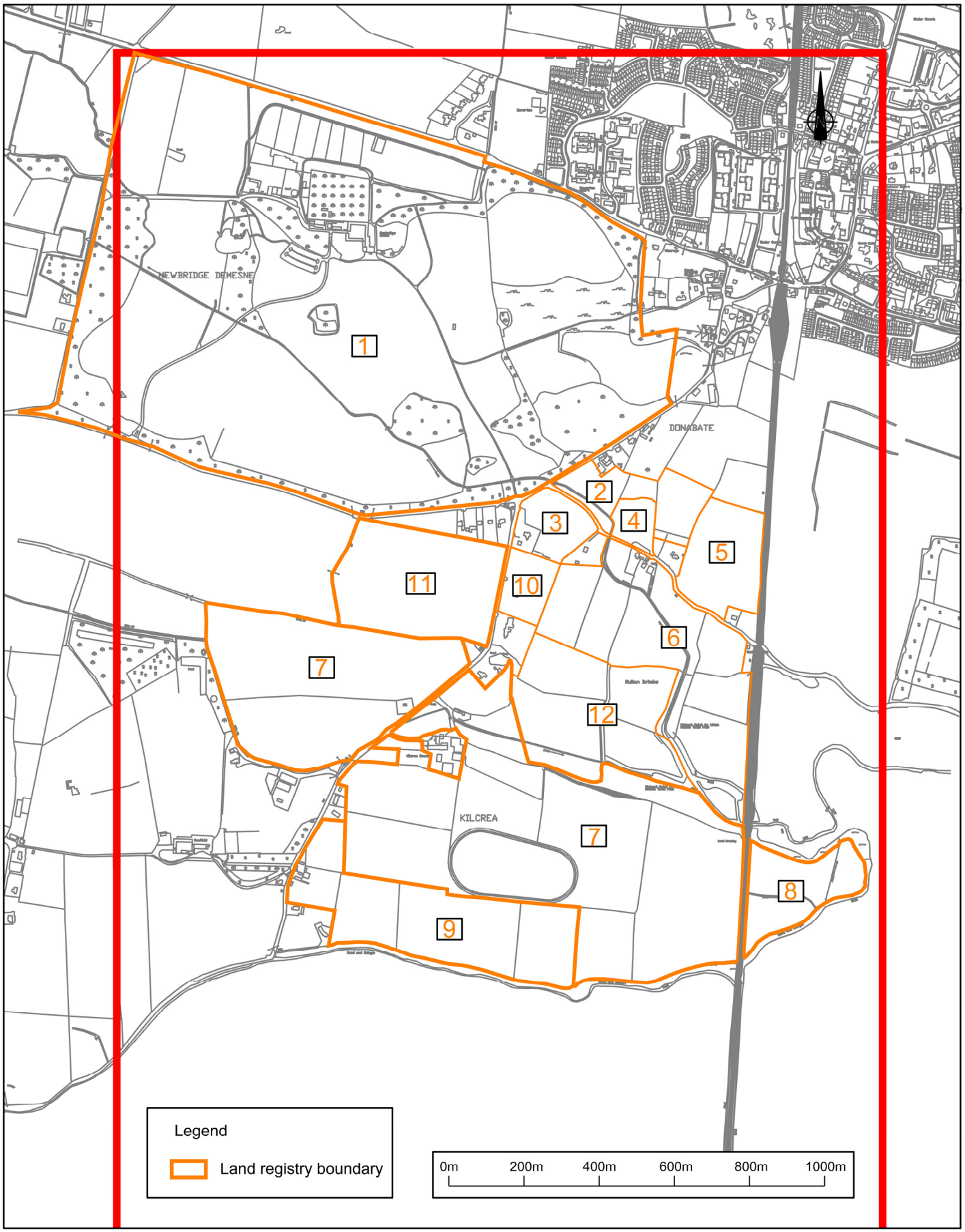
Broadmeadow Way Constraints Report: Figure 10
Agronomy - Soil Types



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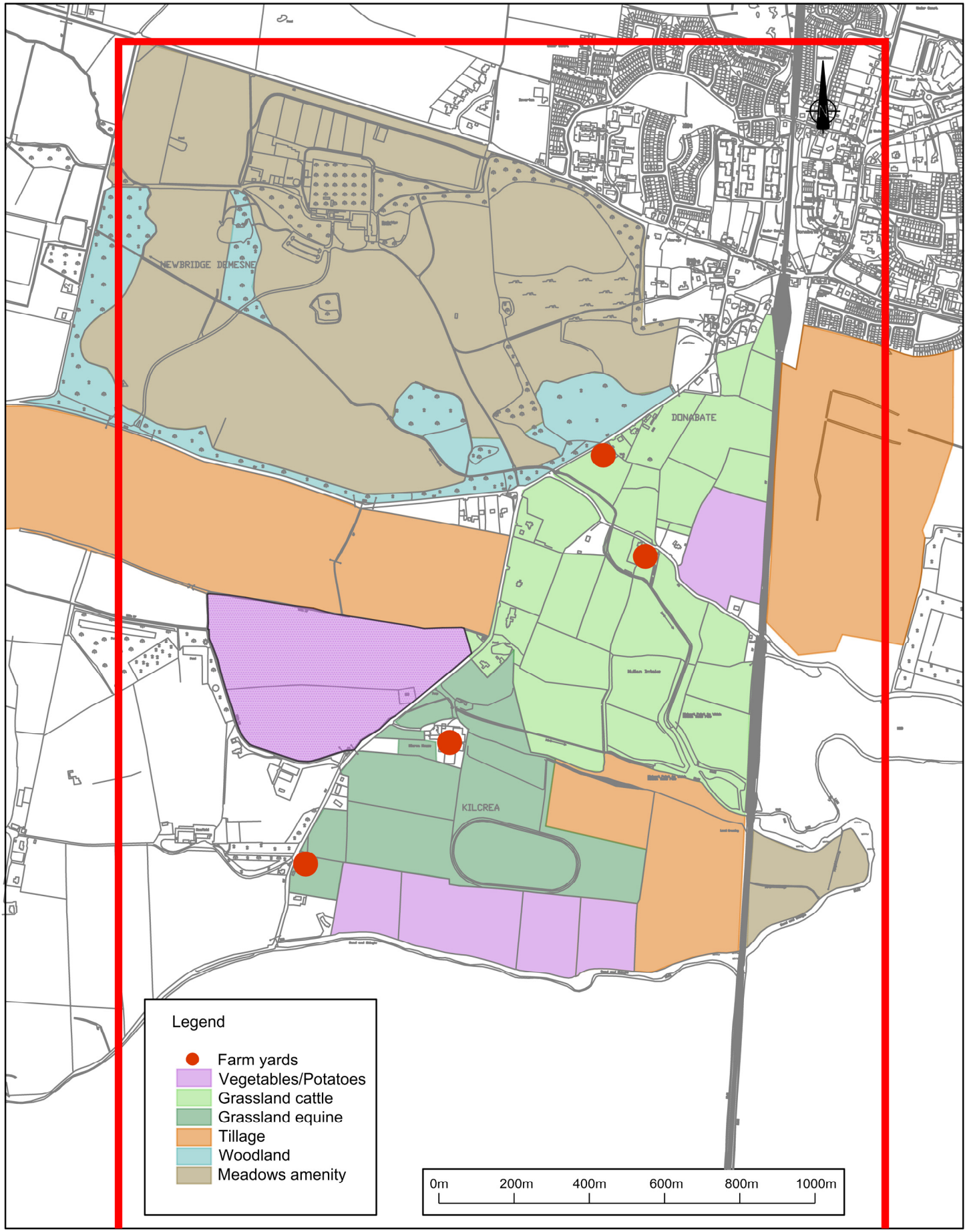
Broadmeadow Way Constraints Report: Figure 11
Agronomy - Land Registry Boundaries



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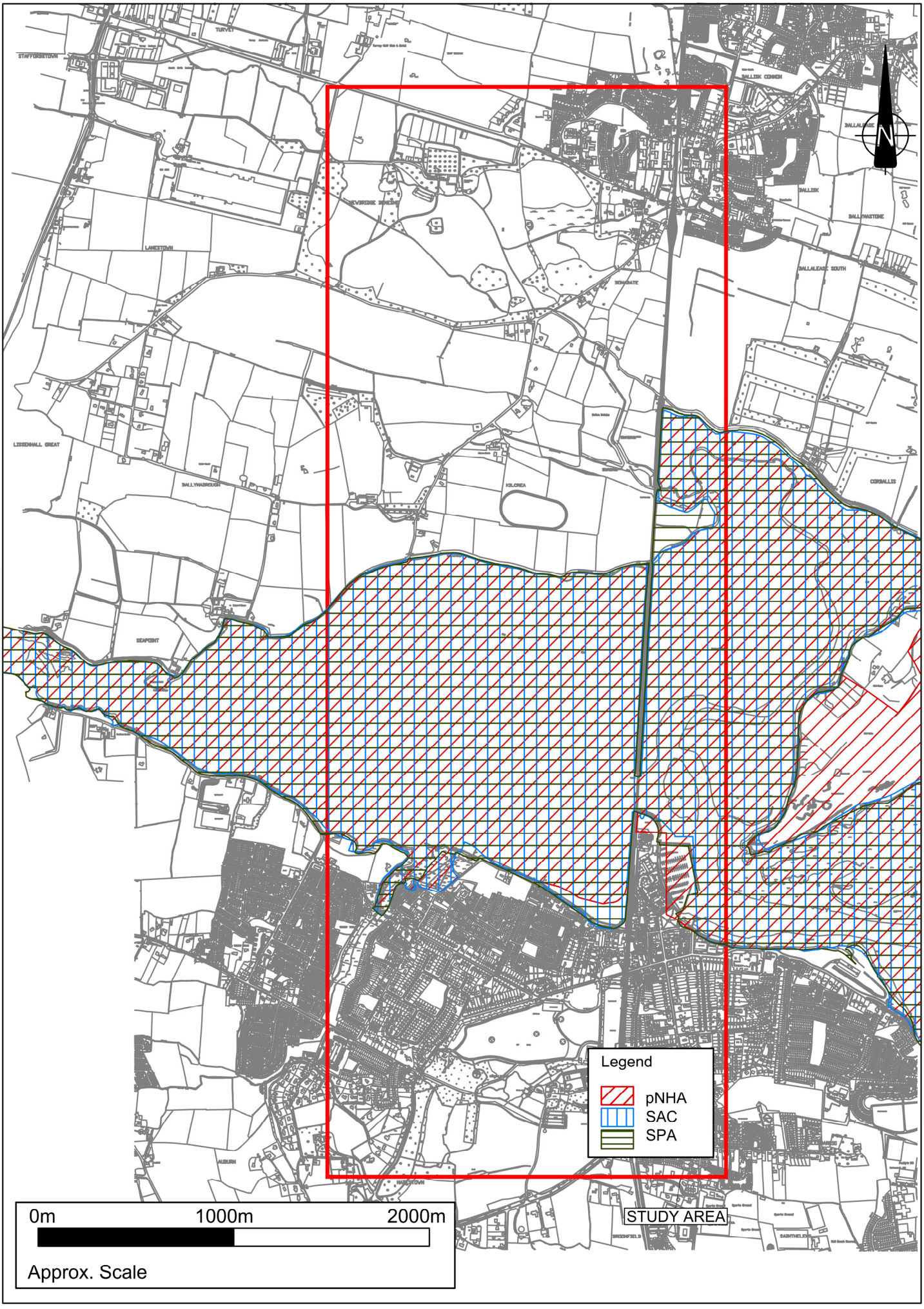
Broadmeadow Way Constraints Report: Figure 12
Farm Enterprise Type & Farm Yards



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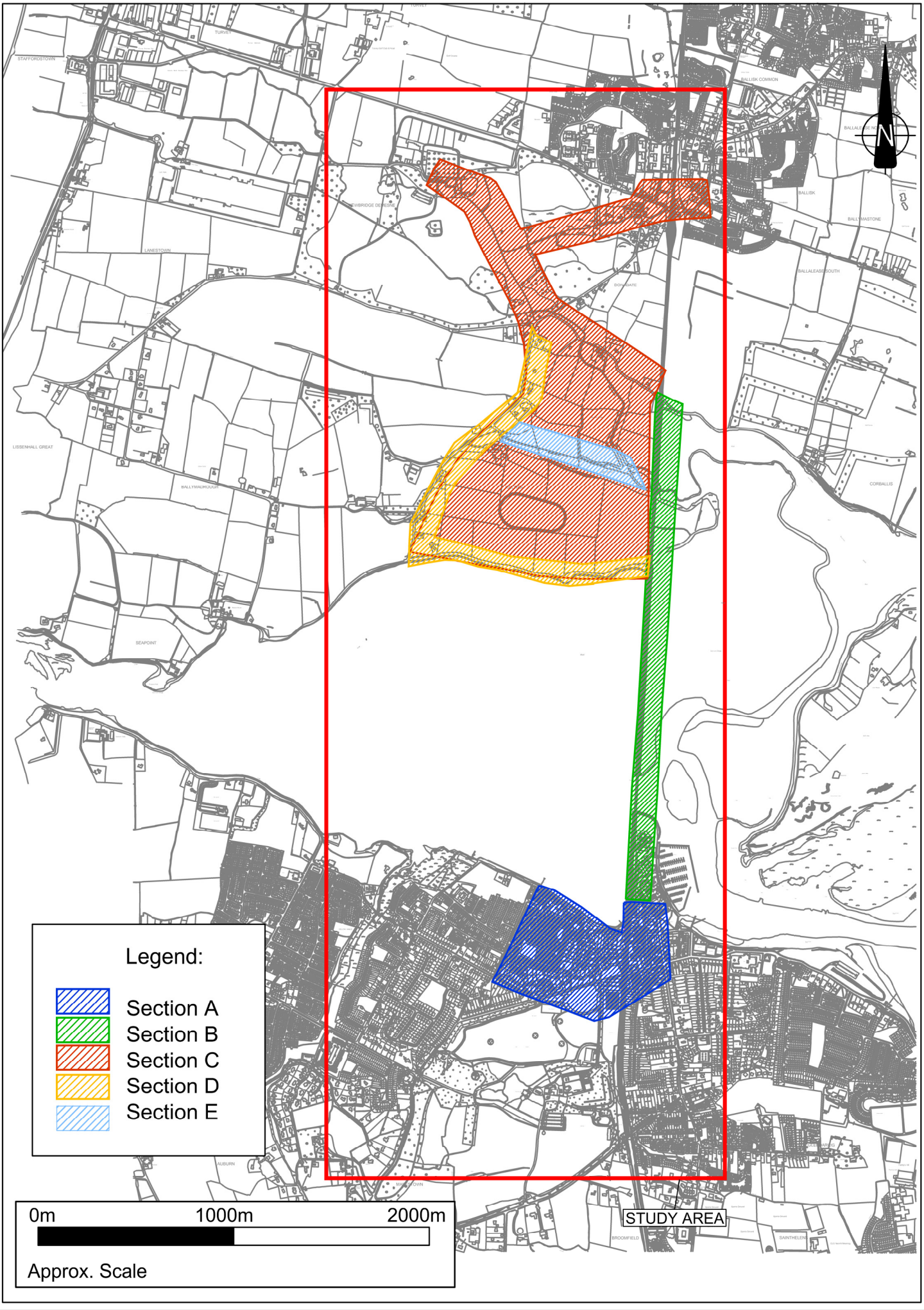
Broadmeadow Way Constraints Report: Figure13
Ecology - Designated Sites



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Broadmeadow Way Constraints Report: Figure 14
Prevailing Noise Levels