5.0 BIODIVERSITY

5.1 Introduction

5.1.1 Background

Faith Wilson Ecological Consultant was commissioned by Birchwell Developments to prepare an Ecological Survey and Impact Assessment as part of a Large-scale Residential Development (LRD) Application for lands proposed for development on lands at Broomfield, Back Road, Malahide, Co. Dublin as shown on **Figure 5.1** below.

The proposed development of the Broomfield LRD on lands at Broomfield, Malahide, Co. Dublin is shown on **Figures 5.1** and **5.2** below.

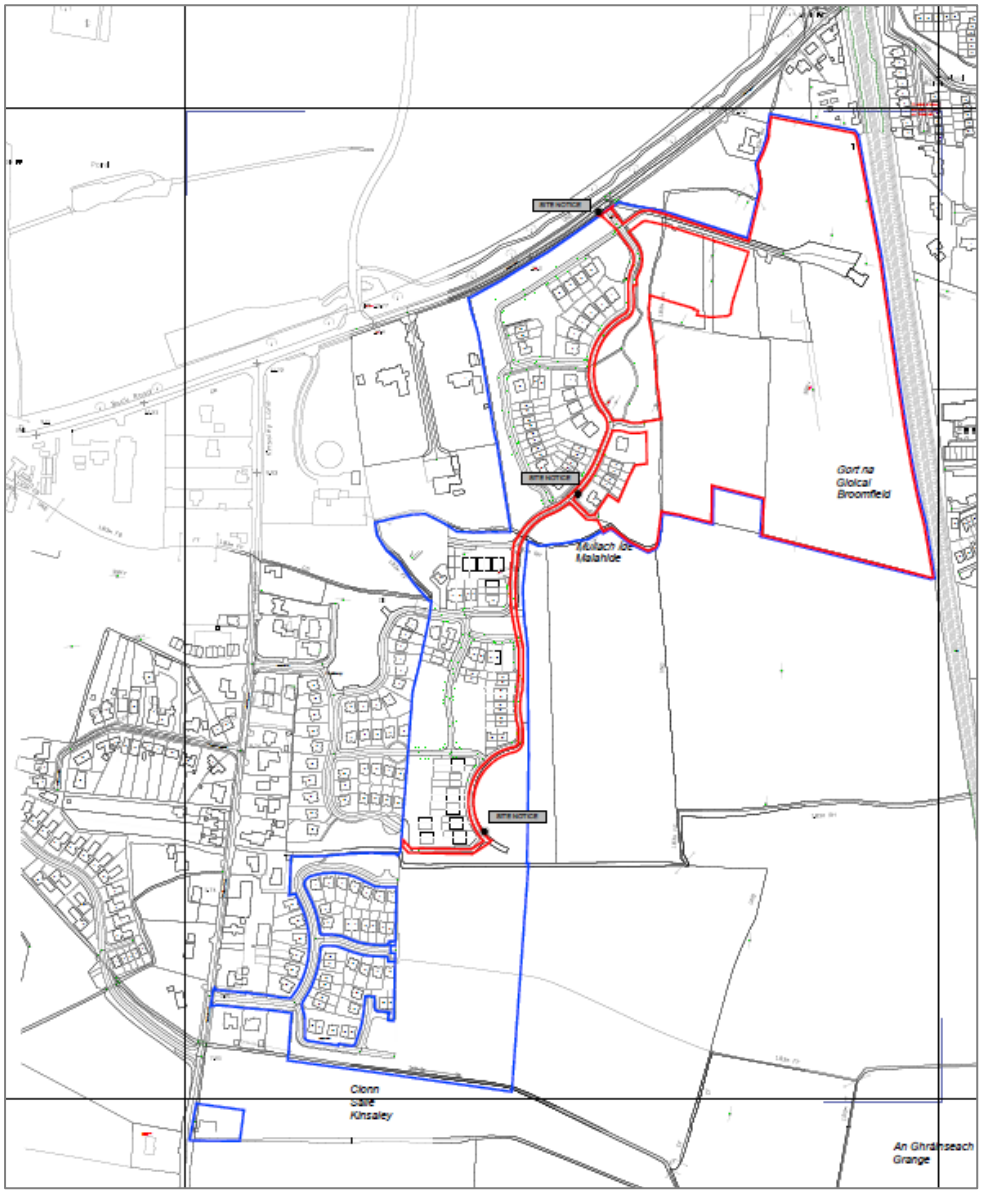

Figure 5.1 The location of the proposed development site for the Broomfield LRD, outlined in red at Broomfield, Malahide, Co. Dublin

Figure 5.2 Proposed site layout for the Broomfield LRD, outlined in red at Broomfield, Malahide, Co. Dublin.

5.1.2 Project Description

The proposed development subject to this Large-Scale Residential Development (LRD) application provides for the demolition of the former rugby clubhouse structure on site and the construction of 297 no. residential units comprising 211 no. houses (14 no. 2 beds, 156 no. 3 beds, 39 no. 4 beds, and 2 no. 5 beds), 46 no. duplex units (9 no. 1 beds, 14 no. 2 beds, and 23 no. 3 beds), 40 no. apartments (23 no. 1 beds, 14 no. 2 beds, and 3 no. 3 beds); 1 no. childcare facility; 1 no. café/restaurant; 1 no. retail unit; 1 no. yoga studio; and all associated site infrastructure and engineering works necessary to facilitate the development. Furthermore, the proposed development provides for a temporary pumping station situated to the southwest of the subject site, in addition to the proposed use of the existing vehicular access off Back Road (proposed vehicular access via Ashwood Hall), as shown on **Figure 5.1** and **5.2** above.

5.2 Methodology

5.2.1 Desk study

A desk study was carried out to collate the available information on the ecological environment potentially impacted by the proposed development at Broomfield and to determine the proximity of the proposed development to designated areas for conservation.

A review of existing information on European sites, their Qualifying Interests and Conservation Objectives, and other available information on the terrestrial and marine ecology in the vicinity of the proposed development was conducted.

Data sources relevant to each European site include the Site Synopsis, Conservation Objectives, the Conservation Objectives backing documents, and the Natura 2000 Standard Data Form, all of which are publicly available online at www.npws.ie were also reviewed.

The National Parks and Wildlife Service (NPWS) of the Department of Housing, Local Government and Heritage database of designated conservation areas and NPWS records of rare and protected plant species as listed under the Irish Red List - Vascular Plants (Wyse Jackson, et al. 2016) or Flora (Protection) Order 2022 were checked with regard to the location of the lands at Broomfield.

Information on protected species of fauna and flora listed for protection under Annex II of the EU Habitats Directive (92/43/EEC), Annex I of the Birds Directive (79/409/EEC) and the Wildlife (Amendment) Act (2000) was also sought from NPWS, the National Biodiversity Data Centre and published sources.

Further ecological information was gathered in relation to the study area by examining GIS datasets, maps and aerial photographs, and by drawing on other existing information.

A review was also completed of the ecological and faunal interest from the general environs of Back Road. Much of this information was gathered by the author of this report during field surveys of previous surveys completed for Ashwood Hall and Brookfield, and lands to the west of here at Lamorlaye, and of studies conducted in Malahide Demesne for Fingal County Council Parks Department.

5.2.2 Field Surveys - Habitat & Botanical Survey

The wider 'Broomfield' lands have been the subject of many years of field surveys by Faith Wilson the first being on the 3rd September 2013 with further surveys conducted on 28th May 2014, 16th May 2017, 11th June 2018, 20th June 2018, and 26th June 2018.

Additional habitat surveys focusing on the lands which form part of this application were conducted on 16th June 2020, 31st August 2020, 16th October 2020, 1st December 2020, 8th January 2021, 24th February 2022, 29th March 2022, 27th November 2023 and most recently on the 9th and 17th July 2024.

The lands have been surveyed to describe and map the habitats present using the habitat survey and mapping techniques described by Smith *et al.* (2011). The habitats within the site were described to

level three using the Heritage Council Guide to Habitats of Ireland (Fossitt (2000)). Plant species within the site were identified using Parnell and Curtis (2012).

A particular focus of the surveys was to determine if any protected species of plant under the Flora (Protection) Order (2022) or listed in the Irish Vascular Plants Red Data Book are present on the site or if any of the habitats present correspond to any of the habitats listed under Annex I of the EU Habitats Directive.

Invasive species present in the site were also identified and mapped if present. A particular focus of the surveys was for those invasive species listed in the Birds and Habitats Regulations 2011.

5.2.3 Field Surveys - Fauna

5.2.3.1 Bat Survey

The bat survey consisted of several elements – a desktop review and consultation with Bat Conservation Ireland, an inspection of trees within the site for their potential to support roosting bats, an inspection of the rugby club building on site due for demolition and several bat detector activity surveys of the property.

The aims of the surveys were to:

a) To determine what species of bats are known from the site and the immediate environs.
b) To identify if a bat roosting site is present in the rugby club building within the site.
c) To determine the use of any mature trees and other habitats in the site as feeding and commuting areas for bats.
d) To ensure that bats are considered and protected in the development.

Bat activity is usually detected by the following signs (though direct observations are also occasionally made):

- bat droppings (these will accumulate under an established roost or under access points);
- insect remains (under feeding perches);
- oil (from fur) and urine stains;
- scratch marks; and
- bat corpses.

The nature and type of habitats present are also indicative of the species likely to be present.

Trees within the wider Broomfield lands had been previously assessed for their potential to support roosting bats on 1st December 2020 and 8th January 2021 by completing a preliminary ground level roost assessment. These assessments were updated on 17th July 2024.

Potential tree roosts were identified using the following standard criteria, which were created by bat specialists from Bat Conservation Ireland for use in the assessments of tree roosts on large infrastructural projects and are summarised in NRA (2006):

- Presence or absence of bat droppings (these can be hard to find amongst leaf litter or may be washed away following periods of wet weather),
- Bat droppings may also be seen as a black streak beneath holes, cracks, branches, etc.,

- Presence or absence of smooth edges with dark marks at potential entrances to roosts,
- Presence or absence of urine stains at potential entrances to roosts,
- Presence of natural cracks and rot holes in the trunk or boughs of the tree,
- Hollow trees,
- Presence or absence of creepers such as ivy or honeysuckle on trees (ivy clad trees are often used by bat species such as pipistrelles as roosts),
- Presence or absence of loose bark such as that of sycamore, or flaky bark on coniferous species such as cedars, cypress and Scot's pine,
- Presence or absence of bracket fungi which may indicate a rotten or potentially hollow centre to the tree,
- Known bat roosts previously identified,
- Trees with storm or machinery damage or broken boughs,
- Clutter level - where the branches and trunk are easily accessible, this is considered a better tree for bat roosts,
- Adjoining habitat - if there are a variety of feeding opportunities for bats, this increases the potential of a tree as a bat roost,
- Adjoining potential roosts / known roosts. This raises the likelihood of a tree being of benefit as bats may move roosts if the roost becomes too hot or cold during roosting and a nearby alternative roost is highly desirable.

The arboricultural features described in the Bat Tree Habitat Key (Andrews, 2013) also informed the survey.

In accordance with best practice as described in the 'Guidelines for the Treatment of Bats During the Construction of National Road Schemes' (NRA 2006) and 'Bat Mitigation Guidelines for Ireland' (Kelleher 2006), a bat activity survey of the property was conducted during the active bat season.

The bat surveys of the wider Broomfield lands were first conducted on 28th May 2014, 16th May 2017, 20th June 2018, 26th /27th June 2018 by Faith Wilson. The rugby club building and the lands within the LRD application were resurveyed for bats on the 16th October 2019, 29th March 2022 and 9th July 2024.

These surveys assisted in determining if any bat roosts remained present in the rugby club building on the site, what bat species occur within the site and how bats are using the property for foraging or commuting purposes.

Bat activity is predominantly bi-modal, with bats taking advantage of increased insect numbers on the wing during the periods after dusk and before dawn, (there is usually a lull in activity in the middle of the night). While this holds true for 'hawking' species (bats that capture prey in the open air), 'gleaning' species such as brown long-eared (*Plecotus auritus*), Natterer's (*Myotis nattereri*) and Whiskered/Brandt's bats (*Myotis mystacinus/brandtii*) remain active throughout the night, as prey is available on foliage for longer periods.

5.2.3.2 Badger Survey

A speedy and productive means of determining the mammal fauna within a site is to walk the entire site concerned, paying particular attention to all hedgerows, treelines, drainage ditches/watercourses, fence lines, paths etc. to locate mammal signs. These include setts, old bedding material, feeding signs, latrines, badger tracks or paw prints, badger paths and badger hair caught on vegetation or fences.

Badger surveys of the lands within and adjoining the Broomfield LRD application lands were first conducted on 28th May 2014, 16th May 2017, 11th June 2018, 20th June 2018, and 26th June 2018 as part of surveys and monitoring work completed for the Ashwood Hall/Broomfield developments. These surveys focused on badger activity along the eastern boundary of the Ashwood Hall development (which lies to the west of and shares a common boundary with the proposed Broomfield LRD application lands).

Further surveys of badger activity along this shared boundary continued during 2019/2020/2021 and 2022. A potential sett was identified to the north of the Rugby Club Building during the initial walkover survey of the property conducted on 16th October 2019 and this was followed up with further surveys on 16th June 2020, 1st December 2020, 5th October 2021, 8th January 2021, 24th February 2022, 29th March 2022 and 27th November 2023. A camera trap had been previously deployed between the 1st December 2020 and 8th January 2021 at this potential sett. The area was re-examined for badger activity on the 9th and 17th July 2024 as part of this application.

The survey was carried out by an experienced mammal specialist (Faith Wilson) in accordance with best practice as described in the 'Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes' (NRA 2009) and 'Guidelines for the treatment of badgers prior to the construction of National Road Schemes' (NRA 2005).

5.2.3.3 Otter Survey

An otter survey was conducted along drainage ditches (and the Hazelbrook Stream in the wider Broomfield lands) during the site visits conducted on 16th June 2020, 1st December 2020, 8th January 2021, 5th October 2021, 24th February 2022, 29th March 2022 and most recently on the 9th and 17th July 2024 in accordance with best practice as described in the 'Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes' (NRA 2009), 'Otter Breeding Sites. Conservation and Management. Conserving Natura 2000 Rivers Conservation Techniques Series No. 5, (Liles, 2003)' and 'Guidelines for the treatment of otters prior to the construction of National Road Schemes' (NRA 2006).

5.2.3.4 Other Mammals

A dedicated survey for other mammals was carried out during the site visits on 31st August 2020, 16th September 2020, 10th June 2021, 5th October 2021, 24th February 2022, 29th March 2022 and most recently on the 9th and 17th July 2024 using the techniques as prescribed in Ecological Survey Techniques for Protected Flora and Fauna (NRA, 2008). This entailed searching for and identification of signs, tracks and droppings of various mammals (including pine marten, Irish stoat, Irish hare, red

squirrel, hedgehog and pygmy shrew along with non-native species such as fallow deer, American mink, grey squirrel and rabbit) within the site.

Bird Survey

All birds seen and heard during the walkover surveys of the Broomfield Lands on the 16th October 2019, 16th June 2020, 31st August 2020, 16th October 2020, 1st December 2020, 8th January 2021, 24th February 2022, 29th March 2022 and most recently on the 9th and 17th July 2024 were recorded.

5.3 Results

5.3.1 Description of the site, its environs, habitats and fauna

The lands proposed for development under the Broomfield LRD application adjoin Phase 1 of the development of these lands (Brookfield and Ashwood Hall).

The lands are located to the south of Back Road and Malahide Castle demesne, and are bounded to the north by private residences and a small development site, to the east by the Dublin Belfast railway line, to the south by arable fields, and to the west by the residential developments of Ashwood Hall and Brookfield.

5.3.2 Habitats

A habitat map of the receiving habitats mapped to Fossitt Level 3 is presented on **Figure 5.3** below. The location of the Hazelbrook Stream is shown on **Figure 5.4** below.

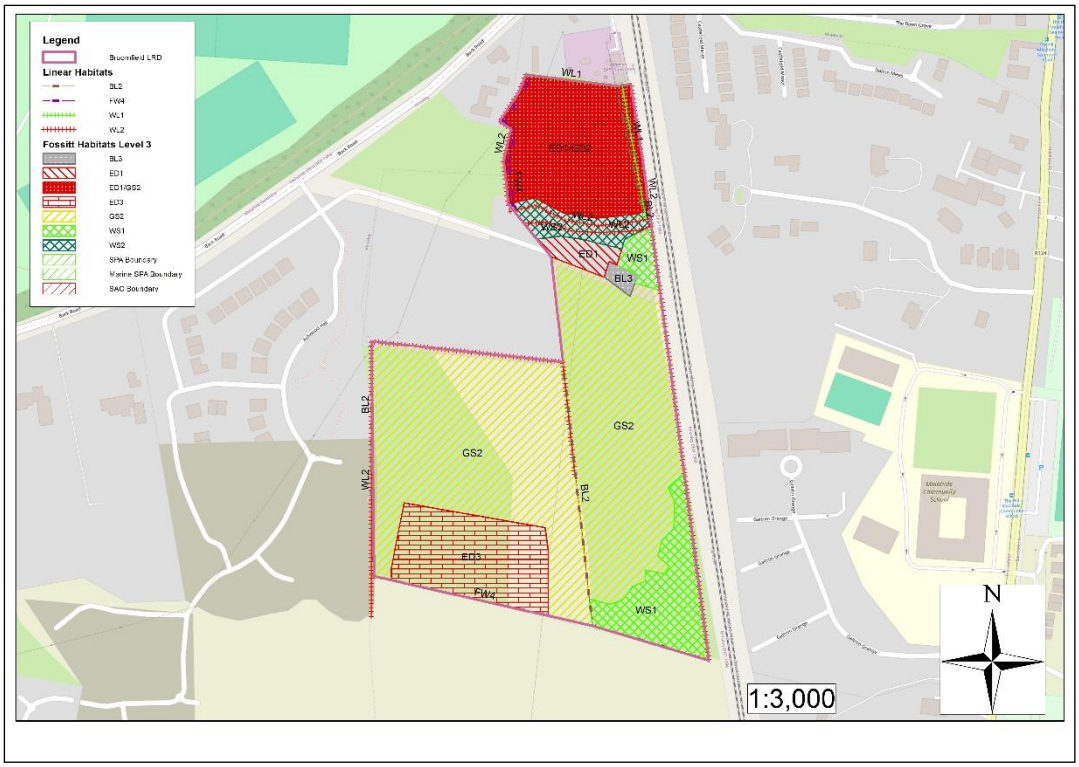

Figure 5.3. Habitat Map of the Broomfield LRD lands.

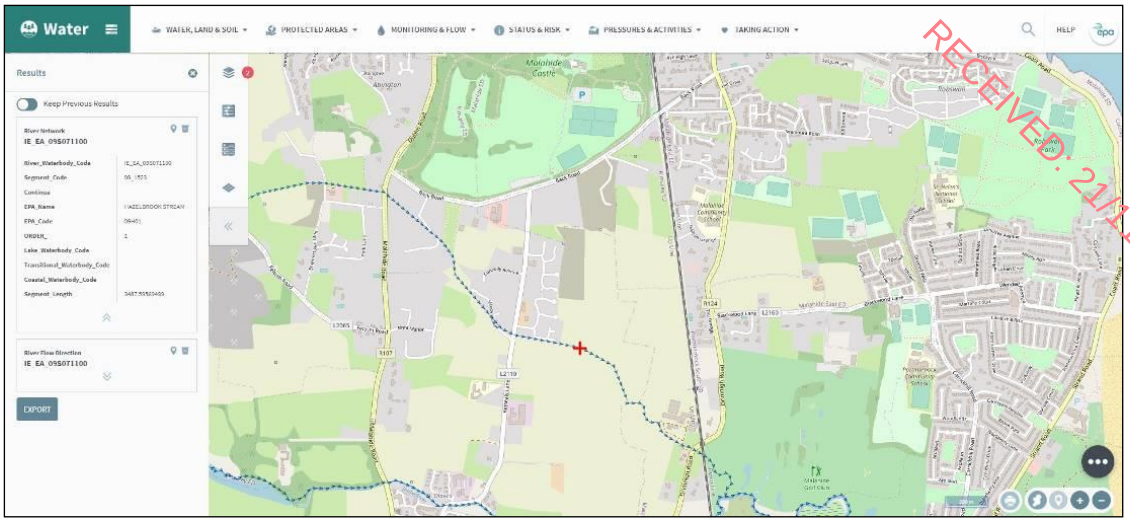

Figure 5.4. The Hazelbrook Stream is found to the south of the site.

The 10km square in which the site is located (O24) contains a number of historical and more recent records of rare and scare botanical species – namely Hairy Violet (*Viola hirta*), Meadow Saxifrage (*Saxifraga granulata*), Red Hemp Nettle (*Galeopsis angustifolia*), Round Prickly Headed Poppy (*Papaver hybridum*), Annual knawel (*Scleranthus annuus*), Lesser Centaury (*Centaurium pulchellum*), Basil Thyme (*Acinos arvensis*), Meadow Barley (*Hordeum secalinum*) and Oyster Plant (*Mertensia maritima*).

None of these species were recorded from the lands at Broomfield, Back Road or are likely to occur within the proposed development given the nature of the habitats present.

The majority of the Broomfield LRD lands include the former Rugby Club lands and clubhouse (BL3). These lands were developed on infilled land adjacent to the railway line and would originally have been managed as amenity grassland but are now dominated by rank grassland (GS2) and scrub (WS1) in the southern parts following years of abandonment.

The former Rugby Club lands are bounded to the east by the Dublin – Belfast railway line. Inside the palisade fence of the railway line and extending for the length of the site to the south is a bank of ash (*Fraxinus excelsior*) oak (*Quercus robur*), hawthorn (*Crataegus monogyna*), elm (Ulmus procera), and sycamore (*Acer pseudoplatanus*). These trees are located offsite and provide an important visual and acoustic screen between the site and the railway line. They are described as G227 in the tree survey report.

To the east of the clubhouse are a number of mature trees of oak, ash. elm and sycamore with Lawson's cypress and Viburnum sp. (described as G189 and G192) in the tree survey report).

Plate 1. Eastern boundary of the rugby club lands adjoining the railway line.

The southern portion of the former Rugby Club lands are dominated by scrub (WS1) consisting of dense tangles of bramble (*Rubus fruticosus* agg.), the non-native invasive butterfly bush (*Buddleia davidii*), and scattered immature ash (*Fraxinus excelsior*). This area is described as G226 in the tree survey report and is well used by Rabbits. Colonising species such as thistles (*Cirsium arvense*) and rosebay willowherb (*Epilobium angustifolium*) are common here as is the invasive non-native species Canadian fleabane (*Conyza canadensis*).

Along the drainage ditch at the southern boundary of the lands are Sycamore, Hawthorn and Bramble (described as G225 in the tree survey report).

The grassland (GS2) on the former playing area is dominated by Yorkshire fog (*Holcus lanatus*), false oat-grass (*Arrhenatherum elatius*), cock's-foot grass (*Dactyls glomerata*), red fescue (*Festuca rubra*), with occasional dandelion (*Taraxacum* agg.), ribwort plantain (*Plantago lanceolata*), creeping buttercup (*Ranunculus repens*), meadow buttercup (*Ranunculus acris*) and germander speedwell (*Veronica chamaedrys*). This is becoming colonised by willows (*Salix cinerea*).

Plate 2. Looking south over the rugby club lands. Treeline G222/G223 is shown by the red arrow.

Plate 3. Scrub at the southern end of the rugby club lands.

Plate 4. Looking south west over the drainage ditch and adjoining agricultural lands from the southern end of the site towards Brookfield.

Plate 5. Looking north east towards the rugby club from the southern end of the site.

The treeline (WL2) extending to the west of the rugby club building has cherry laurel (*Prunus laurocerasus*), silver birch (*Betula pendula*) and false cypress (*Chamaecyparis* sp.) with frequent bramble. This area is described as G186 in the tree survey report. Dense bramble tangles and several ornamental shrubs are also found around the building forming an area of scrub (WS1).

Plate 6. Treeline to the north of the rugby club.

A double treeline (WL2) of Leyland cypress (*Cupressocyparis x leylandii*) (G198) separates the rugby club building from a small field to the north. A deep drainage ditch (FW4) which was dry at the time of survey is found at the base of this treeline and an old disused badger (*Meles meles*) sett, which is currently used by fox (*Vulpes vulpes*) is located here. Three rows of mixed plantings of whitebeam (*Sorbus aria*), apple (*Malus* sp.), cherry (*Prunus* sp.), sycamore, beech (*Fagus sylvatica*), hawthorn (*Crataegus monogyna*), Lombardy poplar (*Populus nigra 'italica'*) and white poplar (*Populus alba*) are found on the north side of this treeline forming an area of immature woodland (WS2) described as G200, G201 and G202 in the tree survey report. Elder, bramble and hawthorn are also present.

The northern field is abandoned pasture which has become invaded by large patches of hogweed (*Heracleum sphondylium*), nettle (*Urtica dioica*), bramble, creeping thistle (*Cirsium arvense*), and docks (*Rumex* sp.) and grasses. This area is heavily grazed by rabbits. There are three scattered hawthorn bushes in this field.

A deep ditch adjoins an earthen bank (BL2) on the eastern boundary and a double hedgerow (WL1) of hawthorn, ash, sycamore and bramble (G206 in the tree survey report) is found here. Numerous rabbit burrows are found on the earthen banks (BL2). An old laneway (possibly a way leave for the railway) is located between it and the fence of the railway line beyond which is a treeline (WL2) of ash, sycamore and hawthorn (G207 in the tree survey report). This is vegetated with hogweed, ivy (*Hedera helix*), bramble, bush vetch (*Vicia sepium*), nettle, false-brome (*Brachypodium sylvaticum*), sycamore seedlings, greater plantain (*Plantago major*), ragwort (*Senecio jacobaea*), docks, Yorkshire fog and lesser burdock (*Arctium minus*).

Some areas of very dense bramble could not be adequately surveyed for fauna in this area and these will need to be supervised during site clearance.

The northern boundary of the northern field is demarcated by a hedgerow (WL1) of ash, elder (*Sambuccus nigra*), bramble and sycamore with occasional mature ash and sycamore (G211 and G213 in the tree survey report). An ESB substation is located here.

Plate 7. The trees between the rugby club and the northern field.

Plate 8. Northern field.

The western boundary of the northern field consists of a treeline (WL2) of mature and semi-mature ash and sycamore located on an earthen bank with cherry laurel (*Prunus laurocerasus*), dog rose (*Rosa canina*), Wych elm (*Ulmus glabra*), beech and hawthorn (G217, 218 and 219 in the tree survey report). A drainage ditch (FW4) which was dry at the time of survey is located at the base of this treeline.

Between the former Rugby Club lands and the Ashwood Hall development (to the south of the former residences) is a field which over time has had a variety of uses which has resulted in various habitats occurring – these included ploughed ground (BC3), land planted with arable crops (BC1), and recolonising set aside (ED2). This area is now dominated by GS2 dry meadow and grassy verge vegetation and is becoming colonised by scattered willows.

A large volume of topsoil was previously stored here from the Ashwood Hall development and this has been colonised with a variety of species including the non–native invasives Butterfly bush, Large bindweed (Calystegia sylvatica) and Canadian fleabane as well as bramble and thistles. A small depression at the base of the soil storage area now supports wetland plants such as reed mace (*Typha latifolia*) and hoary willowherb (*Epilobium hirsutum*). Within the grassland areas curled dock (*Rumex crispus*), white clover, creeping buttercup (*Ranunculus repens*), ribwort plantain (*Plantago lanceolata*), creeping cinquefoil (*Potentilla reptans*), weld (*Reseda luteola*), broad leaved plantain, hoary willowherb, broad-leaved willowherb (*Epilobium montanum*), ragwort (*Senecio jacobaea*), knotgrass (*Polygonum aviculare*), and wild radish (*Brassica rapa*) were frequently recorded as were willows and young oak saplings which have developed through natural succession.

Plate 9. Looking south west over the western field to the areas of stored topsoil.

Plate 10. Looking north west over the western field to the shared treeline boundary with Ashwood Hall and the southern boundary of the former residences.

Plate 11. A small wetland has formed at the base of the soil storage area.

This field is bounded to the west by the shared treeline (WL2) of Ashwood Hall (described as G6, G243, G244, and G245 in the tree survey) which is dominated by mature and semi-mature ash (*Fraxinus excelsior*), oak (*Quercus robur*), wild cherry (*Prunus avium*), sweet chestnut (*Castanea sativa*), sycamore (*Acer pseudoplatanus*), and beech (*Fagus sylvatica*) with an understorey of hawthorn (*Crataegus monogyna*), blackthorn (*Prunus spinosa*), Wych elm (*Ulmus glabra*), bramble (*Rubus fruticosus* agg.), elder (*Sambuccus nigra*) and dog rose (*Rosa canina*). This treeline is located on a shallow earthen bank (BL2) with an associated deep drainage ditch (FW4) which was dry at the time of survey.

The field boundaries of the former hedgerows associated with the now demolished houses form the northern boundary of this field (described as G170 and G171 in the tree report). Species recorded here include field maple (*Acer campestre*), aspen (*Populus tremula*), hawthorn, beech, ash, goat willow (*Salix caprea*), and English elm with bramble. The non-native invasive snowberry bush (*Symphoricarpos alba*) was also recorded here in the south western corner of the central house.

The three private residences, which were located along the entrance to the former rugby club, have been demolished. These works were completed under a bat derogation licence issued by National Parks and Wildlife Service and supervised by Faith Wilson as they previously contained bat roosts. Surrounding the residences are remnant hedgerows (WL1), which have been retained to date. These are dominated mostly by non-native species such as red osier dogwood, leylandii, beech and other ornamental shrubs. Large areas of ground here are dominated by the non-native invasive species Canadian fleabane (*Conyza canadensis*).

The garden of the former western house contained oak, English elm, ash and hawthorn with ivy and bramble in the western boundary (described as G6 in the tree report) with field maple, and sweet chestnut. Along the northern boundary adjoining the road was beech, English elm and Viburnum.

The garden of the former central house contained ash, copper beech, sycamore, Italian alder and oak in the western boundary, cherry and back hybrid poplar in the eastern boundary and Ash and whitebeam in the northern boundary adjoining the road.

The garden of the former eastern house contained ash in the garden, with Himalayan birch, eucalyptus, cherry, apple and Griselinia planted in a group along with a Leyland cypress and ash along the field boundary with the former rugby club lands to the east.

A younger treeline (WL2) of horse chestnut (*Aesculus hippocastanum*) and field maple (*Acer campestre*) is found along the northern boundary of these properties adjoining the road.

5.3.3 Invasive Species

The main invasive species noted in the general vicinity include stands of Japanese knotweed (*Fallopia japonica*), Canadian fleabane and butterfly bush (*Buddleia davidii*) which were found within the rugby club lands. Of these the Japanese knotweed is the only species listed under the Third Schedule of the Communities Birds and Natural Habitats Regulations 2011. The location of the Japanese knotweed stand is shown on **Figure 5.5** below.

Birchwell Developments engaged a trained horticulturalist (Graeme Cahill) to begin treating the Japanese knotweed in 2017. The first treatment of the knotweed at Broomfield was on May 19th 2018. An application rate of 100ml Glyphosate:5 litres water was used. A total of 3 litres of spray was applied via a knapsack sprayer. Follow up treatment has since been conducted over many years. A detailed Japanese knotweed management plan was developed to ensure that this species is not and has not inadvertently been spread during development of the site.

Plate 12. Japanese knotweed on the former rugby club lands following treatment in 2018.

Figure 5.5. Japanese knotweed was recorded here in 2017 and has been treated on site since then by Birchwell.

The Japanese knotweed has been the subject of ongoing treatment in situ and has not spread or become established elsewhere within the site in the intervening period.

Plate 13. Japanese knotweed areas clearly demarcated and treated in January 2021.

5.3.4 Faunal Interest

A Badger and Biodiversity Management Plan was prepared as part of a request for further information from Fingal County Council Planning (Reg Ref: F13A/0459 (Item 4)) and An Bord Pleanála Reference Number: PL 06F.243863 Planning Condition 6 for the development of Ashwood Hall and Broomfield Phase 1. This has been implemented during the construction of the neighbouring developments of Ashwood Hall and Broomfield Phase 1. The results of that initial survey and subsequent surveys are detailed below.

5.3.4.1 Badger

A potential badger (*Meles meles*) sett, was first documented on the Broomfield lands in 2014. This sett was located at the southern end of the shared treeline with Ashwood Hall, which forms the western boundary of the Broomfield LRD lands.

This potential badger sett consisted of a single entrance sett, which was not active at the time of the initial or subsequent surveys. This and a number of other holes and burrows in the area are well used by rabbits but there has been no evidence of any subsequent or current use by badger in further surveys conducted since 2014. At the initial time of identification in 2014 there were feeding signs of badger noted along the southern boundary of the Broomfield Phase 1 lands and a dead badger was noted on the Back Road to the west of the entrance to Malahide Castle which triggered the suggestion that this sett was potentially used by badger.

Surveys conducted in 2019/2020 recorded a possible second disused sett within the treeline north of the rugby club building. This was in use by fox at that time. The locations of these inactive potential setts are shown on **Figure 5.6** below. It was considered possible that the potential setts within the

Broomfield LRD lands were used by badgers as outlier setts to a main territory, which is located within Malahide Castle Demesne.

Figure 5.6. Potential badger setts within the Broomfield LRD lands.

The potential setts within the Broomfield LRD lands were the subject of detailed monitoring using a camera trap over the winter months during 2020/2021. A camera trap was deployed on this sett between 1st December 2020 and 8th January 2021. No evidence of badger was recorded on the trap. Further monitoring was completed in 2022 and the area was re-examined for badger activity on the 9th and 17th July 2024.

The results of these surveys are presented below.

1st December 2020

No badger activity at northern or southern setts – numerous tracks through undergrowth – attributed to rabbit and fox.

8th January 2021

No badger activity at northern or southern setts – numerous tracks through undergrowth – attributed to rabbit and fox.

5th October 2021

No badger activity at northern or southern setts – numerous tracks through undergrowth – attributed to rabbit and fox.

24th February 2022

No badger activity at northern or southern setts – numerous tracks through undergrowth – attributed to rabbit and fox. Large fox scat at northern sett.

29th March 2022

No badger activity at northern or southern setts – numerous tracks through undergrowth – attributed to rabbit.

27th November 2023

No badger activity at northern or southern setts – numerous tracks through undergrowth – attributed to rabbit.

9th and 17th July 2024

No badger activity at northern or southern setts – numerous tracks through undergrowth – attributed to rabbit – population seems to have exploded judging by the activity in the western fields and in the southern portion of the rugby club lands

The burrows previously identified as potential badger setts within the Broomfield lands do not appear to be currently used by badger. There has been no evidence of badger using these lands in recent years. No badger tracks or signs have been seen during any of the surveys.

5.3.4.2 Bats

Bats on the Broomfield lands have been the subject of a number of bat surveys to date as detailed above.

Four species of bats have been recorded using the wider Broomfield LRD lands over several years of survey. These included the following species:

- Leisler's bat (*Nyctalus leisleri*)
- Common Pipistrelle (*Pipistrellus pipistrellus*)
- Soprano Pipistrelle (*Pipistrellus pygmaeus*)
- Brown long-eared bat (*Plecotus auritus*)

Surveys in 2018 confirmed that Brown long-eared bat, common pipistrelle and soprano pipistrelle had availed of the former residential buildings and the rugby clubhouse building on the Broomfield

lands for roosting purposes. The three residential properties were demolished under a bat derogation licence issued by National Parks and Wildlife Service between the 8th and 15th October 2018 under the supervision of Faith Wilson as reported in the 2022 SHD ecological impact assessment report (Wilson, 2022). A bat derogation licence had also been issued for the proposed demolition of the rugby club building as bats had been recorded there in 2018.

This building and the wider LRD lands have been the subject of various surveys since then as detailed below.

2019 Survey

The former rugby club building and the lands proposed for development under the Broomfield LRD application were surveyed on the 16th October 2019 during clear, calm conditions.

Leisler's bat was recorded foraging over the lands and over the area of scrub south of the rugby club building. The rugby club building had been the subject of arson and no longer has an intact roof/attic space. No bats were recorded emerging from this property.

Plate 14. Rugby club building destroyed by arson in 2019.

Soprano pipistrelle bat and common pipistrelle bat were recorded foraging along the laneway leading from the rugby club west towards Ashwood Hall, over the northern field and in the shelter of the laneway adjoining the railway line and along the central treeline between Ashwood Hall and the eastern Broomfield LRD lands.

2022 Survey

The former rugby club and the lands proposed for development under the Broomfield LRD application were resurveyed on the 29th March 2022 during clear, calm conditions. Initial temperatures were 9.5°C dropping to 8°C at the end of the survey.

The first bat species recorded was observed at 20:20 when a Leisler's bat was recorded foraging along the edge of the railway line and over the area of scrub south of the rugby club building.

Plate 15. Rugby club building in 2022.

The rugby club building had deteriorated further in condition with fascia removed and the soffits exposed. No bats were recorded emerging from this property.

Common pipistrelle and soprano pipistrelle bats were recorded foraging in the shelter of the treelines/vegetation adjoining the railway line, along the treeline at the northern side of the access road to the site and along the treeline which forms the western boundary of the northern lands with Ashwood Hall.

2024

The bat survey conducted on the 9th July 2024 recorded similar activity to that in 2022. No bats were recorded emerging from the arson damaged rugby club building. The condition of this building has deteriorated further since it was last surveyed as can be seen on **Plate 16** below.

Three species of bats were recorded foraging and commuting in the LRD lands and sonograms of the echolocation calls of common pipistrelle and soprano pipistrelle can be seen below on **Figures 5.7** and **5.8**. The treelines to the east and north of the rugby club were favoured by bats with approximately 15 common pipistrelle recorded foraging there along with occasional Leisler's and soprano pipistrelle.

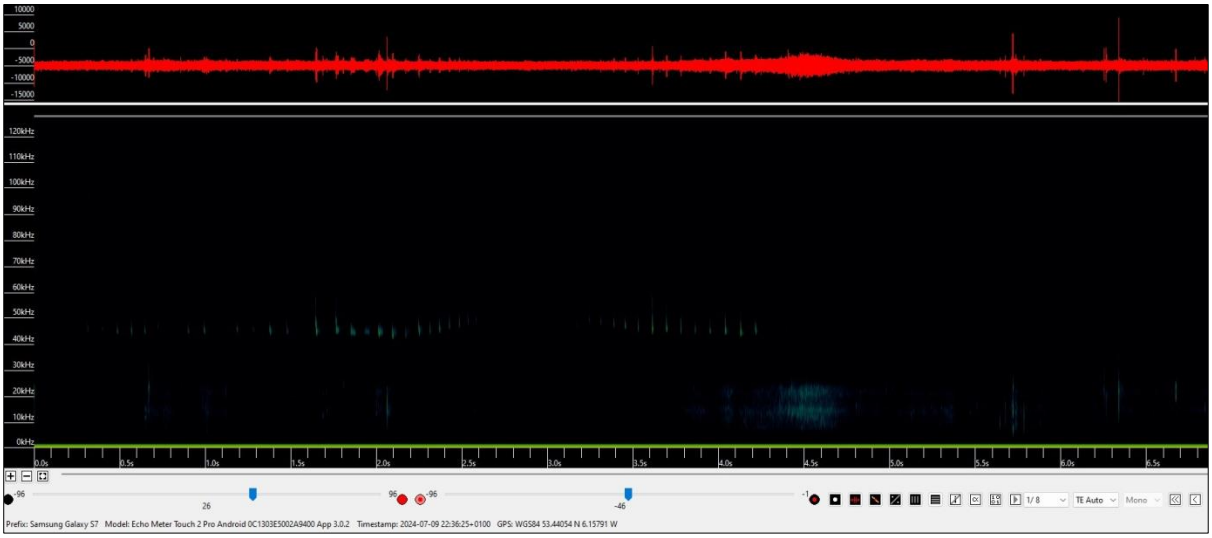

Figure 5.7. Sonogram of common pipistrelle bat on the LRD lands.

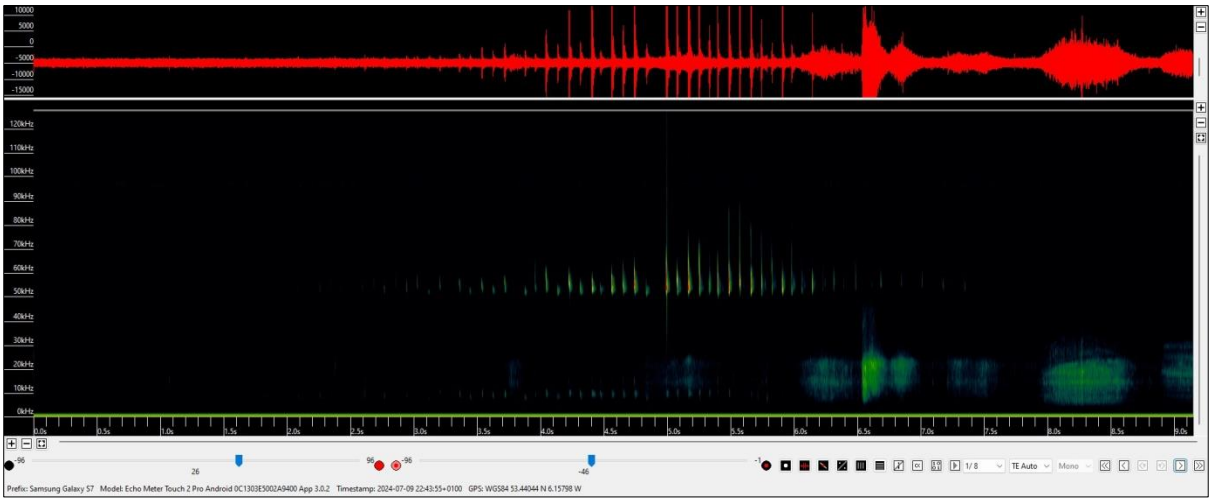

Figure 5.8. Sonogram of soprano pipistrelle bat on the LRD lands.

Plate 16. Former rugby club building in 2024.

Plate 17. Former rugby club building in 2024.

5.3.4.3 Other Mammals

The terrestrial fauna consists of species typical of the open countryside of North Dublin. There are many rabbits (*Oryctolagus cuniculus*) present and a fox (*Vulpes vulpes*) has been both seen and heard during many site visits. A foxes den was noted on grounds within the railway cutting along the eastern boundary of the LRD lands.

Other common fauna that would be expected include brown rat (*Rattus norvegicus*), long tailed field mouse (*Apodemus sylvaticus*), house mouse (*Mus musculus*), hedgehog (*Erinaceus europaeus*), and pygmy shrew (*Sorex minutus*). Irish stoat (*Mustela erminea hibernica*) may also occur but have not been observed – they have been recorded from Malahide Demesne to the north of the lands, where grey squirrels (*Sciurus carolinensis*) are also frequent.

Otters have been recorded on the Hazelbrook Stream which is located outside the LRD lands to the south west of the site (F. Wilson, pers. obs.). Drainage ditches in the Broomfield lands drain to this watercourse.

5.3.4.4 Birds

The bird fauna recorded was rich and a good variety of breeding species were recorded. Species recorded from hedgerows and treelines within the site over the years include blackbird, yellowhammer, robin, willow warbler, goldfinch, wren, blue tit, song thrush, bullfinch, chaffinch, starling, woodpigeon, starling, dunnock, jackdaw, and greenfinch.

Corvid species recorded on site include; rook, magpie, hooded crow and jackdaw.

Pied wagtails were recorded in the vicinity of the new housing at Ashwood Hall.

Birds of prey such as buzzard and sparrowhawk were confirmed using the area and summer visitors, such as swallow were regularly observed.

Species such as redwing and fieldfare may visit during the winter months.

The lands are not suitable for wintering birds but the wider agricultural lands are used on occasion by gulls following ploughs and other agricultural machinery during soil preparation.

The Hazelbrook Stream which is located to the south of the site supports Mallard ducks and Grey heron have been seen flying over the LRD lands on several occasions.

5.3.4.5 Amphibians

There are no ponds or other water features within the red line boundary of the site that could support breeding frogs and newts – however these species may on occasion utilise the areas of standing water in drainage ditches and slow flowing sections of the Hazelbrook Stream in the wider landscape.

5.4 Description of Natura 2000 Sites

In line with the European Commission Methodological Guidance (EC (2001) and EC (2021)) and the DoEHLG Guidance (DoEHLG (2010)) a review of all European sites that could be potentially affected by the proposed project was made using the NPWS online map viewer. These included any European sites within or adjacent to the land at Broomfield and any European sites within the likely zone of impact of the proposed development (using the source – pathway – receptor criteria) including any downstream. These are summarised in **Table 5.4.1** below and shown on **Figure 5.9**.

In addition to the identified European sites consideration was also given to relevant species listed under Annexes I and II and IV of the Birds and Habitats Directives respectively.

The lands at Broomfield are not currently designated for any nature conservation purposes.

Nineteen European sites within the likely zone of impact of the proposed development (using the source – pathway – receptor criteria) including any downstream have been identified. These include nine Special Areas of Conservation (SACs), and ten Special Protection Areas (SPAs) as follows

- Malahide Estuary SAC (Site Code: 000205)
- Malahide Estuary SPA (Site Code: 004025)
- The North-West Irish Sea SPA (Site Code: 004236)
- Baldoyle Bay SAC (Site Code: 000199)
- Baldoyle Bay SPA (Site Code: 004016)
- North Dublin Bay SAC (Site Code: 000206)
- North Bull Island SPA (Site Code: 004006)
- Rockabill to Dalkey Islands SAC (Site Code: 003000)
- Rogerstown Estuary SAC (Site Code: 000208)
- Rogerstown Estuary SPA (Site Code: 004015)
- Ireland's Eye SAC (Site Code: 002193)
- Ireland's Eye SPA (Site Code: 004117)
- South Dublin Bay/Tolka Estuary SPA (Site Code: 004024)
- South Dublin Bay SAC (Site Code: 000210)
- Howth Head SAC (Site Code: 000202)
- Howth Head Coast SPA (Site Code: 004113)
- Lambay Island SAC (Site Code: 000204)
- Lambay Island SPA (Site Code: 004069)
- Skerries Islands SPA (Site Code: 004122)

Some of these and a number of other sites in the area are also designated as proposed Natural Heritage Areas:

- Lambay Island pNHA (Site Code: 000204),
- Rogerstown Estuary pNHA (Site Code: 000208)
- Portraine Shore pNHA (Site Code: 001215),
- Malahide Estuary pNHA (Site Code: 000205),
- Feltrim Hill pNHA (Site Code: 001218),
- Sluice River Marsh pNHA (Site Code: 001763),
- Santry Demesne pNHA (Site Code: 000178),
- Ireland's Eye pNHA (Site Code: 000203),

- Howth Head pNHA (Site Code: 000202),
- Baldoyle Bay pNHA (Site Code: 000199).

Hydrological Links to Natura 2000 sites:

There are no Natura 2000 sites located either within or directly adjacent to the proposed development lands at Broomfield.

The most relevant of the protected sites is Baldoyle Bay SAC/SPA/pNHA, which is hydrologically connected to the lands at Broomfield via the drainage ditch along the southern boundary of the site which ultimately flows to the Hazelbrook Stream. This watercourse and the surface waters from the site drain to the Sluice River and discharge into Baldoyle Bay, which is designated as the Baldoyle Bay SAC/SPA.

The site is also potentially linked to the Malahide Estuary SAC/SPA/pNHA sites as foul waters from the development will be discharged to the wastewater treatment plant in Malahide.

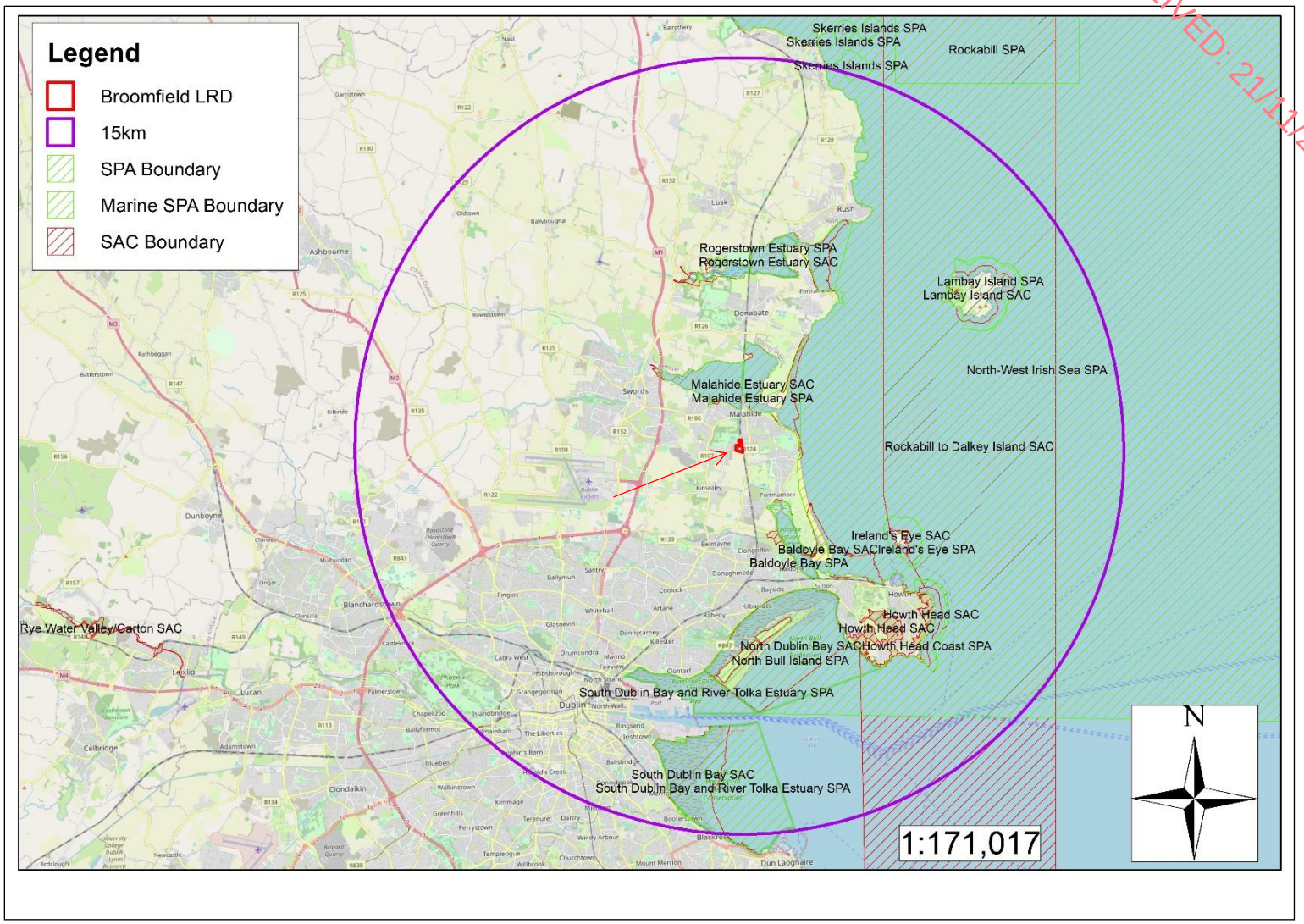

Figure 5.9. *Identification of relevant European sites within the likely zone of impact of the proposed development at Broomfield (indicated by the red arrow), using the source – pathway – receptor criteria, including any downstream.*

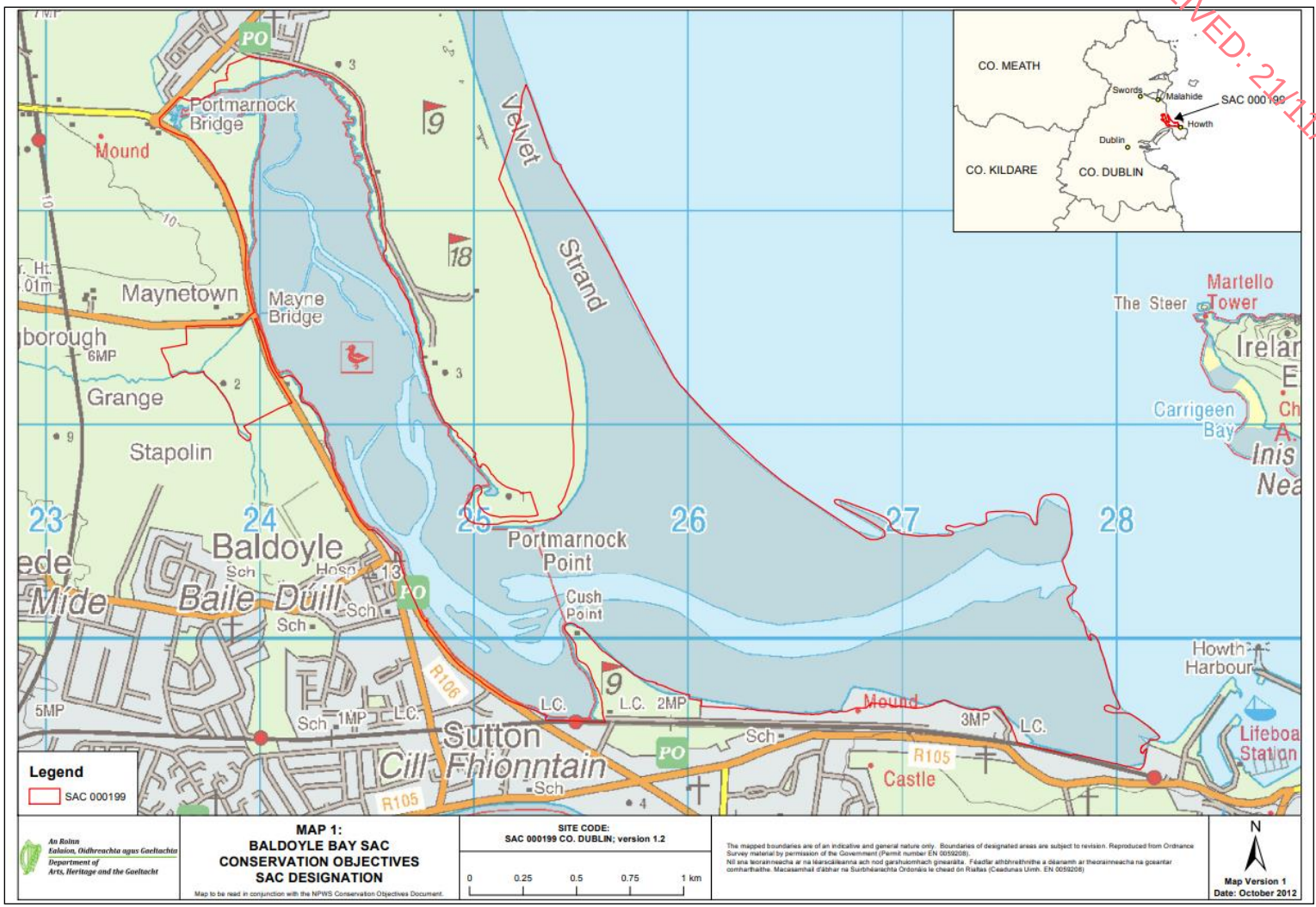

Figure 5.10. Baldoyle Bay SAC (Site Code: 000199). (Source: NPWS (2012) Conservation Objectives: Baldoyle Bay SAC 000199. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.).

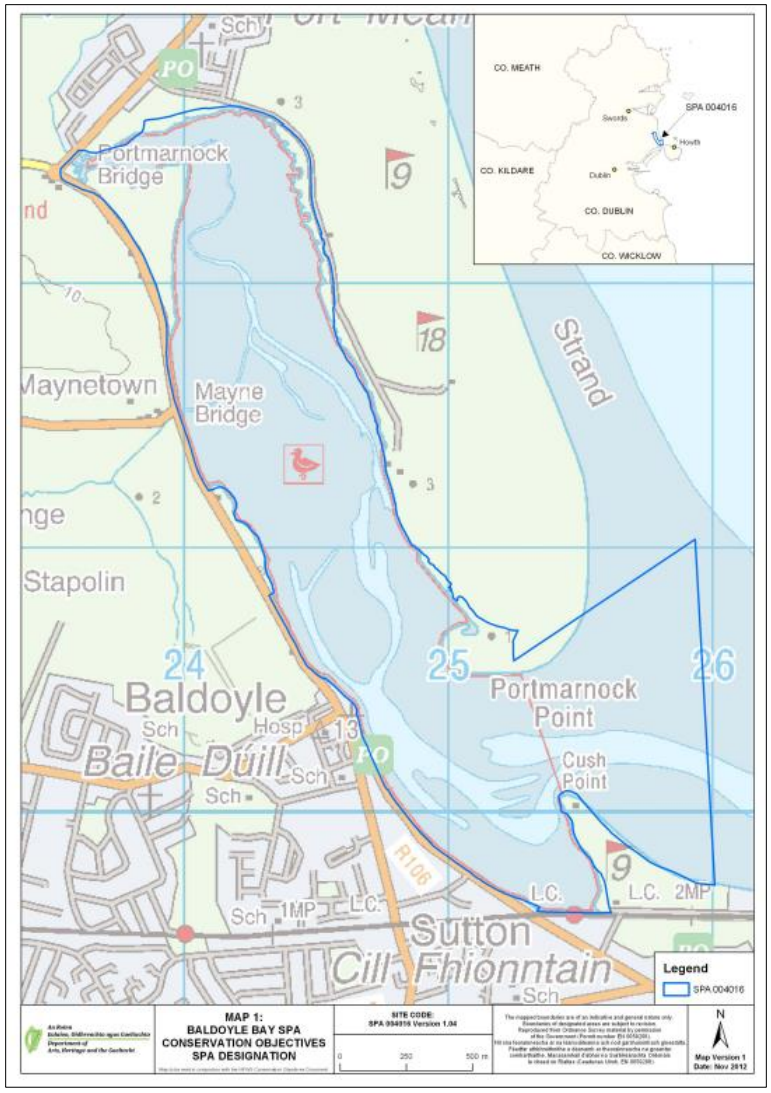

Figure 5.11. Baldoyle Bay SPA (Site Code: 004016). (Source: NPWS (2013) Conservation Objectives: Baldoyle Bay SPA 004016. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht).

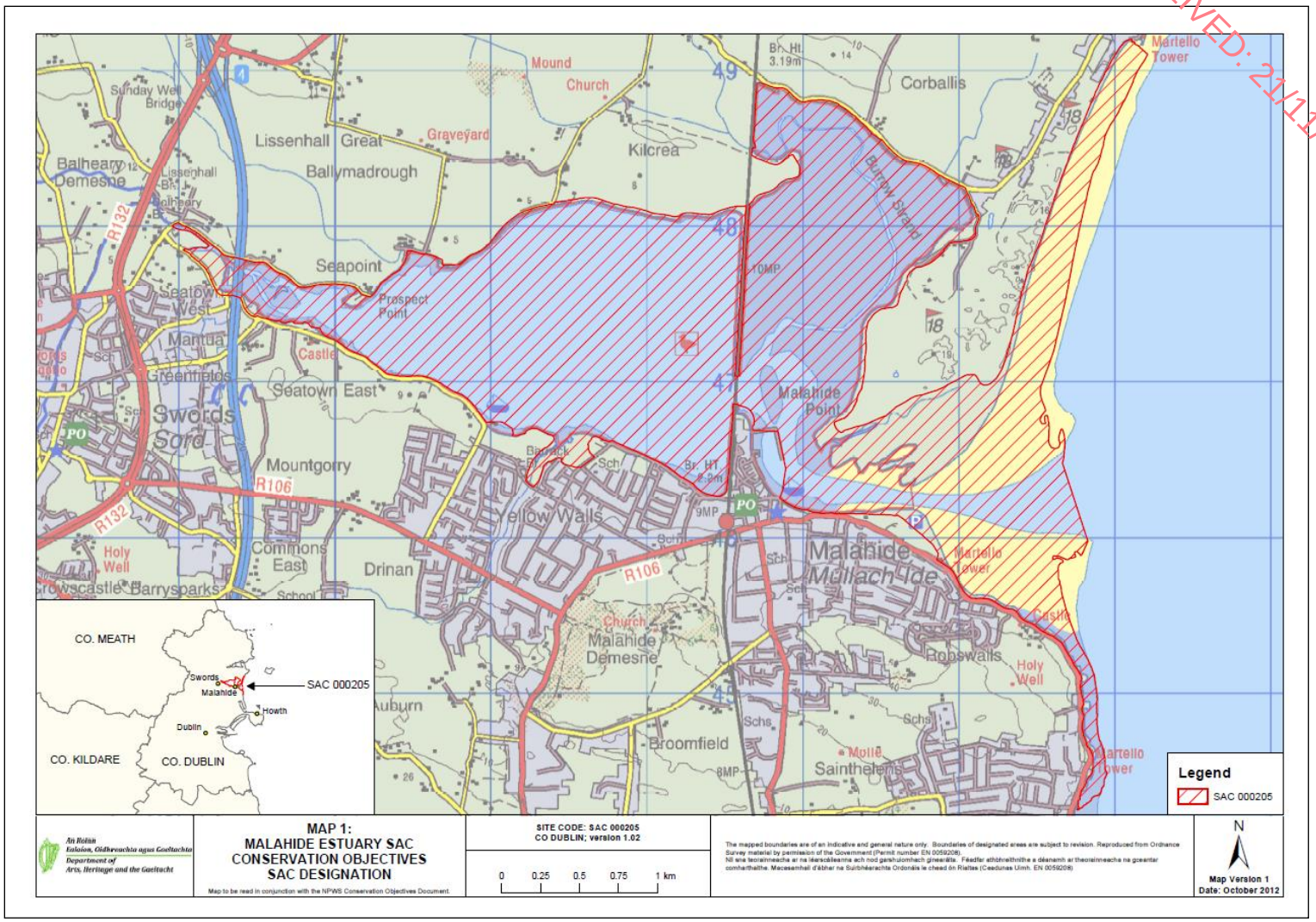

Figure 5.12. Malahide Estuary SAC (Site Code: 000205). (Source: NPWS (2013) Conservation Objectives: Malahide Estuary SAC 000205).

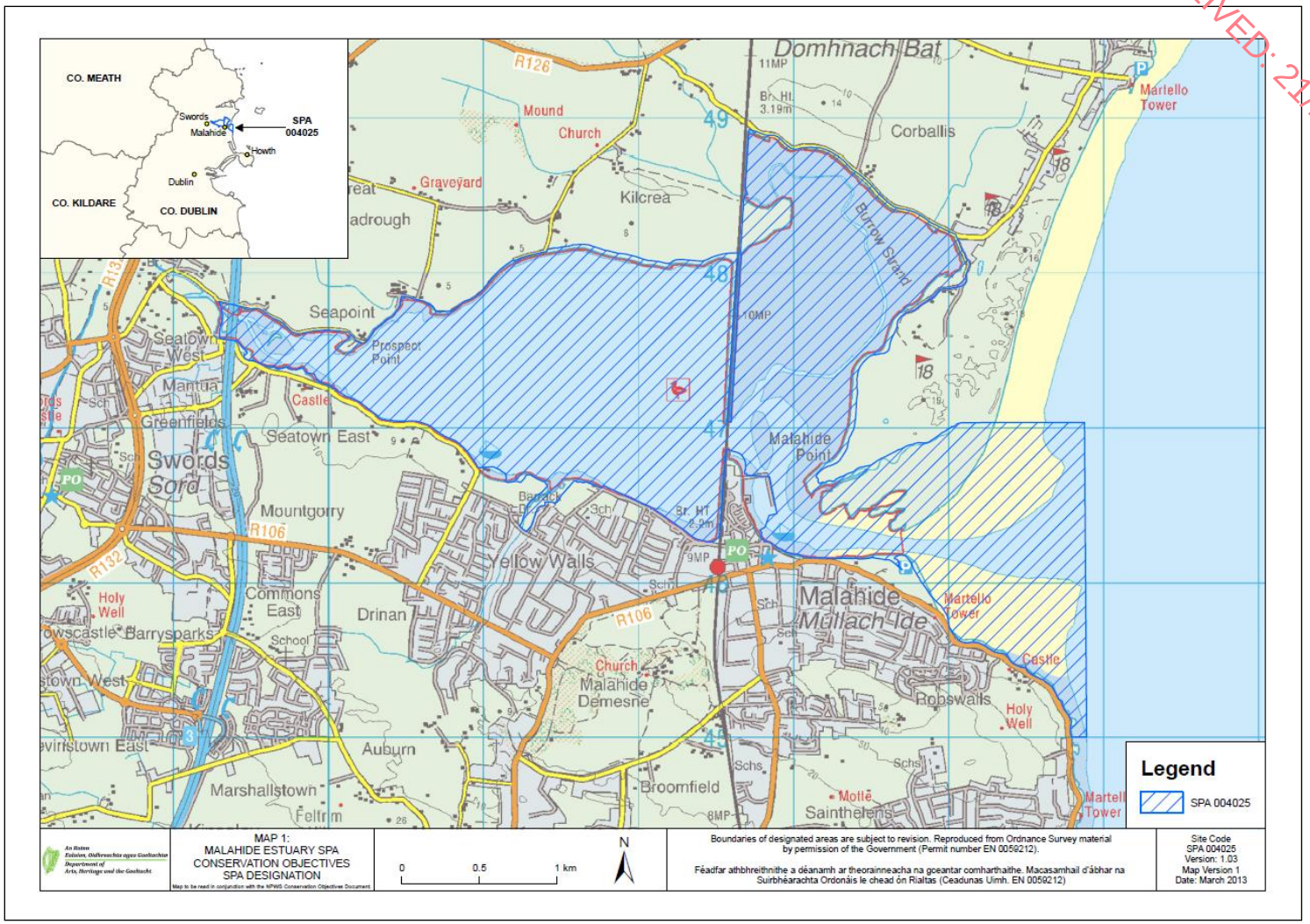

Figure 5.13. Malahide Estuary SPA (Site Code: 004025). (Source: NPWS (2013) Conservation Objectives: Malahide Estuary SPA 004025).

Table 5.4.1. Designated Natura 2000 sites of relevance to the LRD lands at Broomfield.

Site Code	Site Name and Designation	Approximate distance from the Broomfield Lands	Qualifying Interest	General Conservation Objectives	Potential for Likely Significant Effects
000205	Malahide Estuary SAC	1.3km N	• (1140) Mudflats and sandflats not covered by seawater at low tide • (1310) *Salicornia* and other annuals colonizing mud and sand • (1320) Spartina swards (*Spartinion maritimae*) • (1330) Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) • (1410) Mediterranean salt meadows (*Juncetalia maritimi*) • (2130) Fixed coastal dunes with herbaceous vegetation (grey dunes)* • (2120) Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes)	Source: NPWS (2013) Conservation Objectives: Malahide Estuary SAC 000205. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht. Accessed 21st October 2024. To maintain the favourable conservation condition of the Annex I habitats for which the SAC has been selected: • (1140) Mudflats and sandflats not covered by seawater at low tide • (1310) *Salicornia* and other annuals colonizing mud and sand • (1320) Spartina swards (*Spartinion maritimae*) • (1330) Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) • (1410) Mediterranean salt meadows (*Juncetalia maritimi*) • (2130) Fixed coastal dunes with herbaceous vegetation (grey dunes)* • (2120) Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes)	Yes, Screened in. Wastewater from the development will discharge to the Malahide WWTP thereby creating a hydrological link between the site and this European Site.
004025	Malahide Estuary SPA	1.3km N	• Great Crested Grebe (*Podiceps cristatus*) [A005] • Light-bellied Brent Goose (*Branta*	Source: NPWS (2013) Conservation Objectives: Malahide Estuary SPA 004025. Version 1.	Yes, Screened in. Wastewater from the development will discharge to

Site Code	Site Name and Designation	Approximate distance from the Broomfield Lands	Qualifying Interest	General Conservation Objectives	Potential for Likely Significant Effects
			bernicla hrota) [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*) [A149] • Black-tailed Godwit (*Limosa limosa*) [A156] • Bar-tailed Godwit (*Limosa lapponica*) [A157] • Redshank (*Tringa totanus*) [A162] • Wetlands & Waterbirds [A999]	National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht. Accessed 21st October 2024. To maintain the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA: • [wintering] *Podiceps cristatus* • [wintering] *Branta bernicla hrota* • [wintering] *Tadorna tadorna* • [wintering] *Anas acuta* • [wintering] *Bucephala clangula* • [wintering] *Mergus serrator* • [wintering] *Haematopus ostralegus* • [wintering] *Pluvialis squatarola* • [wintering] *Calidris canutus* • [wintering] *Limosa limosa* • [wintering] *Limosa lapponica* • [wintering] *Tringa tetanus* To maintain the favourable conservation condition of the wetland habitat in Malahide Estuary SPA as a resource for the regularly-occurring migratory waterbirds that utilise it.	the Malahide WWTP thereby creating a hydrological link between the site and this European Site. The Broomfield lands do not support ex situ wintering populations of waterbird Special Conservation Interests of Malahide Estuary SPA.
000199	Baldoyle Bay SAC	2.6km SE	• (1140) Mudflats and sandflats not covered by seawater at low tide • (1310) *Salicornia* and other annuals colonizing mud and sand	Source: NPWS (2012) Conservation Objectives: Baldoyle Bay SAC 000199. Version 1.0. National Parks and Wildlife Service, Department of Arts,	Yes, Screened in. Surface waters from the development will discharge to the Baldoyle Bay SAC thereby

Site Code	Site Name and Designation	Approximate distance from the Broomfield Lands	Qualifying Interest	General Conservation Objectives	Potential for Likely Significant Effects
			• (1330) Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) • (1410) Mediterranean salt meadows (*Juncetalia maritimi*)	Heritage and the Gaeltacht. Accessed 21st October 2024. To maintain the favourable conservation condition of the Annex I habitats for which the SAC has been selected: • (1140) Mudflats and sandflats not covered by seawater at low tide • (1310) *Salicornia* and other annuals colonizing mud and sand • (1330) Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) • (1410) Mediterranean salt meadows (*Juncetalia maritimi*)	creating a link between the site and this European Site.
004016	Baldoyle Bay SPA	2.6km SE	• Light-bellied Brent Goose (*Branta bernicla hrota*) [A046] • Shelduck (*Tadorna tadorna*) [A048] • Ringed Plover (*Charadrius hiaticula*) [A137] • Golden Plover (*Pluvialis apricaria*) [A140] • Grey Plover (*Pluvialis squatarola*) [A141] • Bar-tailed Godwit (*Limosa lapponica*) [A157] • Wetlands & Waterbirds [A999]	Source: NPWS (2013) Conservation Objectives: Baldoyle Bay SPA 004016. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht. Accessed 21st October 2024. To maintain the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA: • [wintering] *Branta bernicla hrota* • [wintering] *Tadorna tadorna* • [wintering] *Charadrius hiaticula* • [wintering] *Pluvialis squatarola* • [wintering] *Limosa lapponica*	Yes, Screened in. Surface waters from the development will discharge to the Baldoyle Bay SPA thereby creating a link between the site and this European Site. The Broomfield lands do not support ex situ wintering populations of waterbird Special Conservation Interests of Baldoyle Bay SPA.

Site Code	Site Name and Designation	Approximate distance from the Broomfield Lands	Qualifying Interest	General Conservation Objectives	Potential for Likely Significant Effects
				To maintain the favourable conservation condition of the wetland habitat in Baldoyle Bay SPA	
004236	North-West Irish Sea SPA	2.3km E	• Common Scoter (*Melanitta nigra*) [A065] • Red-throated Diver (*Gavia stellata*) [A001] • Great Northern Diver (*Gavia immer*) [A003] • Fulmar (*Fulmarus glacialis*) [A009] • Manx Shearwater (*Puffinus puffinus*) [A013] • Shag (*Phalacrocorax aristotelis*) [A018] • Cormorant (*Phalacrocorax carbo*) [A017] • Little Gull (*Larus minutus*) [A177] • Kittiwake (*Rissa tridactyla*) [A188] • Black-headed Gull (*Chroicocephalus ridibundus*) [A179] • Common Gull (*Larus canus*) [A182] • Lesser Black-backed Gull (*Larus fuscus*) [A183] • Herring Gull (*Larus argentatus*) [A184] • Great Black-backed Gull (*Larus marinus*) [A187] • Little Tern (*Sterna albifrons*) [A195] • Roseate Tern (*Sterna dougallii*) [A192] • Common Tern (*Sterna hirundo*) [A193] • Arctic Tern (*Sterna paradisaea*) [A194] • Puffin (*Fratercula arctica*) [A204]	Source: NPWS (2023) Conservation Objectives: North-west Irish Sea SPA 004236. Version 1. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage. Accessed 21st October 2024. To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA. • A001 Red-throated Diver *Gavia stellata* • A003 Great Northern Diver *Gavia immer* • A009 Fulmar *Fulmarus glacialis* • A013 Manx Shearwater *Puffinus puffinus* • A017 Cormorant *Phalacrocorax carbo* • A018 Shag *Phalacrocorax aristotelis* • A065 Common Scoter *Melanitta nigra* • A179 Black-headed Gull *Chroicocephalus ridibundus* • A182 Common Gull *Larus canus* • A183 Lesser Black-backed Gull *Larus fuscus* • A184 Herring Gull *Larus argentatus*	Yes, Screened in. Wastewater from the development will discharge to the Malahide WWTP thereby creating a link between the site and this European Site. The Broomfield lands do not support ex situ breeding, foraging or wintering populations of waterbird Special Conservation Interests of North-West Irish Sea SPA.

Site Code	Site Name and Designation	Approximate distance from the Broomfield Lands	Qualifying Interest	General Conservation Objectives	Potential for Likely Significant Effects
			• Razorbill (*Alca torda*) [A200] • Guillemot (*Uria aalge*) [A199]	• A187 Great Black-backed Gull *Larus marinus* • A188 Kittiwake *Rissa tridactyla* • A192 Roseate Tern *Sterna dougallii* • A193 Common Tern *Sterna hirundo* • A194 Arctic Tern *Sterna paradisaea* • A195 Little Tern *Sterna albifrons* • A199 Guillemot *Uria aalge* • A200 Razorbill *Alca torda* • A204 Puffin *Fratercula arctica* • A862 Little Gull *Hydrocoloeus minutus*	
000206	North Dublin Bay SAC	9.9km SE	• (1140) Mudflats and sandflats not covered by seawater at low tide • (1210) Annual vegetation of drift lines • (1310) *Salicornia* and other annuals colonizing mud and sand • (1320) *Spartina* swards (Spartinion maritimae) • (1330) Atlantic salt meadows (Glauco-Puccinellietalia maritimae) • (1395) Petalwort (*Petalophyllum ralfsii*) • (1410) Mediterranean salt meadows (Juncetalia maritimi) • (2110) Embryonic shifting dunes • (2120) Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) • (2130) Fixed coastal dunes with herbaceous vegetation (grey dunes) • (2190) Humid dune slacks	Source: NPWS (2013) Conservation Objectives: North Dublin Bay SAC 000206. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht. Accessed 21st October 2024. To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected: • (1140) Mudflats and sandflats not covered by seawater at low tide • (1210) Annual vegetation of drift lines • (1310) *Salicornia* and other annuals colonizing mud and sand • (1320) *Spartina* swards (Spartinion maritimae) • (1330) Atlantic salt meadows (Glauco-Puccinellietalia maritimae) • (1395) Petalwort (*Petalophyllum ralfsii)*	No. There is no potential pathway for likely significant effects arising from this development on this European Site on account of distance.

Site Code	Site Name and Designation	Approximate distance from the Broomfield Lands	Qualifying Interest	General Conservation Objectives	Potential for Likely Significant Effects
				• (1410) Mediterranean salt meadows (Juncetalia maritimi) • (2110) Embryonic shifting dunes • (2120) Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) • (2130) Fixed coastal dunes with herbaceous vegetation (grey dunes) • (2190) Humid dune slacks	
004006	North Bull Island SPA	9.9km SE	• Light-bellied Brent Goose (*Branta bernicla hrota*) • Shelduck (*Tadorna tadorna*) • Teal (*Anas crecca*) • Pintail (*Anas acuta*) • Shoveler (*Anas clypeata*) • Oystercatcher (*Haematopus ostralegus*) • Golden Plover (*Pluvialis apricaria*) • Grey Plover (*Pluvialis squatarola*) • Knot (*Calidris canutus*) • Sanderling (*Calidris alba*) • Dunlin (*Calidris alpina*) • Black-tailed Godwit (*Limosa limosa*) • Bar-tailed Godwit (*Limosa lapponica*) • Curlew (*Numenius arquata*) • Redshank (*Tringa totanus*) • Turnstone (*Arenaria interpres*) • Black-headed Gull (*Larus ridibundus*) • Wetlands & Waterbirds	Source: NPWS (2015) Conservation Objectives: North Bull Island SPA 004006. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht. Accessed 21st October 2024. To maintain the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA: • *Branta bernicla hrota* [wintering] • *Tadorna tadorna* [wintering] • *Anas crecca* [wintering] • *Anas acuta* [wintering] • *Anas clypeata* [wintering] • *Haematopus ostralegus* [wintering] • *Pluvialis apricaria* [wintering] • *Pluvialis squatarola* [wintering] • *Calidris canutus* [wintering] • *Calidris alba* [wintering] • *Calidris alpina* [wintering] • *Limosa limosa* [wintering] • *Limosa lapponica* [wintering]	No. There is no potential pathway for likely significant effects arising from this development on this European Site on account of distance. The Broomfield lands do not support ex situ wintering populations of waterbird Special Conservation Interests of North Bull Island SPA.

Site Code	Site Name and Designation	Approximate distance from the Broomfield Lands	Qualifying Interest	General Conservation Objectives	Potential for Likely Significant Effects
				• *Numenius arquata* [wintering] • *Tringa totanus* [wintering] • *Arenaria interpres* [wintering] • *Chroicocephalus ridibundus* [wintering] • Wetlands	
003000	Rockabill to Dalkey Islands SAC	5.6km E	• (1170) Reefs • (1351) Harbour Porpoise (*Phocoena phocoena*)	Source: NPWS (2013) Conservation Objectives: Rockabill to Dalkey Island SAC 003000. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht. Accessed 21st October 2024. To maintain the favourable conservation condition of the Annex I habitat and the Annex II species for which the SAC has been selected: • (1170) Reefs • (1351) Harbour Porpoise (*Phocoena phocoena*)	No. There is no potential pathway for likely significant effects arising from this development on this European Site on account of distance.
004117	Ireland's Eye SPA	6.2km SE	• Cormorant (*Phalacrocorax carbo*) [A017] • Herring Gull (*Larus argentatus*) [A184] • Kittiwake (*Rissa tridactyla*) [A188] • Guillemot (*Uria aalge*) [A199] • Razorbill (*Alca torda*) [A200]	Source: NPWS (2022). Conservation objectives for Ireland's Eye SPA [004117]. First Order Site specific Conservation Objectives Version 1.0. Department of Housing, Local Government and Heritage. Accessed 21st October 2024. To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this	No. There is no potential pathway for likely significant effects arising from this development on this European Site on account of distance. There is no suitable habitat for breeding seabirds within the site. The Broomfield lands do not support

Site Code	Site Name and Designation	Approximate distance from the Broomfield Lands	Qualifying Interest	General Conservation Objectives	Potential for Likely Significant Effects
				SPA: • [breeding]*Phalacrocorax carbo* • [breeding] *Larus argentatus* • [breeding] *Rissa tridactyla* • [breeding] *Uria aalge* • [breeding]*Alca torda*	ex situ breeding populations of the Special Conservation Interests of Ireland's Eye SPA.
002193	Ireland's Eye SAC	6.5km SE	• Perennial vegetation of stony banks [1220] • Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]	Source: NPWS (2017) Conservation Objectives: Ireland's Eye SAC 002193. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs. Accessed 21st October 2024. To maintain the favourable conservation condition of the Annex I habitats for which the SAC has been selected: • Perennial vegetation of stony banks [1220] • Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]	No. There is no potential pathway for likely significant effects arising from this development on this European Site on account of distance.
000208	Rogerstown Estuary SAC	6.5km N	• (1130) Estuaries • (1140) Mudflats and sandflats not covered by seawater at low tide • (1310) *Salicornia* and other annuals colonizing mud and sand • (1330) Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) • (1410) Mediterranean salt meadows (*Juncetalia maritimi*) • (2120) Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes)	Source: NPWS (2013) Conservation Objectives: Rogerstown Estuary SAC 000208. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht. Accessed 21st October 2024. To maintain the favourable conservation condition of the Annex I habitats for which the SAC has been selected:	No. There is no potential pathway for likely significant effects arising from this development on this European Site on account of distance.

Site Code	Site Name and Designation	Approximate distance from the Broomfield Lands	Qualifying Interest	General Conservation Objectives	Potential for Likely Significant Effects
			• (2130) Fixed coastal dunes with herbaceous vegetation (grey dunes)*	• (1130) Estuaries • (1140) Mudflats and sandflats not covered by seawater at low tide • (1310) *Salicornia* and other annuals colonizing mud and sand • (1330) Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) • (1410) Mediterranean salt meadows (*Juncetalia maritimi*) • (2120) Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) • (2130) Fixed coastal dunes with herbaceous vegetation (grey dunes)*	
004015	Rogerstown Estuary SPA	6.5km N	• Greylag Goose (*Anser anser*) [A043] • Light-bellied Brent Goose (*Branta bernicla hrota*) [A046] • Shelduck (*Tadorna tadorna*) [A048] • Shoveler (*Anas clypeata*) [A056] • Oystercatcher (*Haematopus ostralegus*) [A130] • Ringed Plover (*Charadrius hiaticula*) [A137] • Grey Plover (*Pluvialis squatarola*) [A141] • Knot (*Calidris canutus*) [A143] • Dunlin (*Calidris alpina*) [A149] • Black-tailed Godwit (*Limosa limosa*) [A156] • Redshank (*Tringa totanus*) [A162] • Wetlands & Waterbirds [A999]	Source: NPWS (2013) Conservation Objectives: Rogerstown Estuary SPA 004015. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht. Accessed 21st October 2024. To maintain the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA: • [wintering] *Anser anser* • [wintering] *Branta bernicla hrota* • [wintering] *Tadorna tadorna* • [wintering] *Anas clypeata* • [wintering] *Haematopus ostralegus* • [wintering] *Charadrius hiaticula*	No. There is no potential pathway for likely significant effects arising from this development on this European Site on account of distance. The Broomfield lands do not support ex situ wintering bird populations of the Special Conservation Interests of Rogerstown Estuary SPA.

Site Code	Site Name and Designation	Approximate distance from the Broomfield Lands	Qualifying Interest	General Conservation Objectives	Potential for Likely Significant Effects
				• [wintering] *Pluvialis squatarola* • [wintering] *Calidris canutus* • [wintering] *Limosa limosa* • [wintering] *Tringa totanus* To maintain the favourable conservation condition of wetland habitat in Rogerstown Estuary SPA as a resource for the regularly occurring migratory waterbirds that utilise it.	
004024	South Dublin Bay and River Tolka Estuary SPA	12.8km S	• Brent goose (*Branta bernicla hrota*), • Sandwich Tern (*Sterna sandvicensis*), • Roseate Tern (*Sterna dougallii*), • Common Tern (*Sterna hirundo*), • Arctic Tern (*Sterna paradisaea*), • Oystercatcher (*Haematopus ostralegus*), • Ringed Plover (*Charadrius hiaticula*), • Knot (*Calidris canuta*), • Sanderling (*Calidris alba*), • Dunlin (*Calidris alpina*), • Bar-tailed Godwit (*Limosa lapponica*)	Source: NPWS (2015). Conservation Objectives: South Dublin Bay and River Tolka Estuary SPA 004024. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht. Accessed 21st October 2024. To maintain the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA: • Brent goose (*Branta bernicla hrota*), • Sandwich Tern (*Sterna sandvicensis*), • Roseate Tern (*Sterna dougallii*), • Common Tern (*Sterna hirundo*), • Arctic Tern (*Sterna paradisaea*), • Oystercatcher (*Haematopus ostralegus*), • Ringed Plover (*Charadrius hiaticula*), • Knot (*Calidris canuta*), • Sanderling (*Calidris alba*), • Dunlin (*Calidris alpina*),	No. There is no potential pathway for likely significant effects arising from this development on this European Site on account of distance. The Broomfield lands do not support habitat for breeding populations or ex situ wintering bird populations of the Special Conservation Interests of South Dublin Bay and River Tolka Estuary SPA.

Site Code	Site Name and Designation	Approximate distance from the Broomfield Lands	Qualifying Interest	General Conservation Objectives	Potential for Likely Significant Effects
				• Bar-tailed Godwit (*Limosa lapponica*) To maintain the favourable conservation condition of wetland habitat in South Dublin and the River Tolka Estuary SPA as a resource for the regularly occurring migratory waterbirds that utilise it.	
000202	Howth Head SAC	12km SE	• Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] • European dry heaths [4030]	Source: NPWS (2016). Conservation objectives: Howth Head SAC 000202. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs. Accessed 21st October 2024. To maintain or restore the favourable conservation condition of the Annex I habitats for which the SAC has been selected: • Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] • European dry heaths [4030]	No. There is no potential pathway for likely significant effects arising from this development on this European Site on account of distance.
004113	Howth Head Coast SPA	12.6km SE	• Kittiwake (*Rissa tridactyla*) [A188]	Source: NPWS (2022). Conservation objectives for Howth Head Coast SPA [004113]. First Order Site specific Conservation Objectives Version 1.0. Department of Housing, Local Government and Heritage. Accessed 21st October 2024.	No. There is no potential pathway for likely significant effects arising from this development on this European Site on account of distance. The Broomfield lands do not support breeding bird populations of the

Site Code	Site Name and Designation	Approximate distance from the Broomfield Lands	Qualifying Interest	General Conservation Objectives	Potential for Likely Significant Effects
				To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA: • [breeding] *Rissa tridactyla*	Special Conservation Interests of Howth Head Coast SPA.
000210	South Dublin Bay SAC	14.9km S	• Mudflats and sandflats not covered by seawater at low tide [1140] • Annual vegetation of drift lines [1210] • Salicornia and other annuals colonising mud and sand [1310] • Embryonic shifting dunes [2110]	Source: NPWS (2013) Conservation Objectives: South Dublin Bay SAC 000210. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht. Accessed 21st October 2024. To maintain or restore the favourable conservation condition of the Annex I habitats for which the SAC has been selected: • Mudflats and sandflats not covered by seawater at low tide [1140] • Annual vegetation of drift lines [1210] • Salicornia and other annuals colonising mud and sand [1310] • Embryonic shifting dunes [2110]	No. There is no potential pathway for likely significant effects arising from this development on this European Site on account of distance.
000204	Lambay Island SAC	9.8km NE	• (1230) Vegetated sea cliffs of the Atlantic and Baltic coasts • (1170) Reefs • (1364) *Halichoerus grypus* • (1265) *Phoca vitulina*	Source: NPWS (2013) Conservation Objectives: Lambay Island SAC 000204. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht. Accessed 21st October 2024. To maintain the favourable conservation	No. There is no potential pathway for likely significant effects arising from this development on this European Site on account of distance.

Site Code	Site Name and Designation	Approximate distance from the Broomfield Lands	Qualifying Interest	General Conservation Objectives	Potential for Likely Significant Effects
				condition of the Annex I habitat and the Annex II species for which the SAC has been selected: • (1230) Vegetated sea cliffs of the Atlantic and Baltic coasts • (1170) Reefs • (1364) *Halichoerus grypus* • (1265) *Phoca vitulina*	
004069	Lambay Island SPA	9.8km NE	• Fulmar (*Fulmarus glacialis*) [A009] • Cormorant (*Phalacrocorax carbo*) [A017] • Shag (*Phalacrocorax aristotelis*) [A018] • Greylag Goose (*Anser anser*) [A043] • Lesser Black-backed Gull (*Larus fuscus*) [A183] ^ • Herring Gull (*Larus argentatus*) [A184] ^ • Kittiwake (*Rissa tridactyla*) [A188] • Guillemot (*Uria aalge*) [A199] • Razorbill (*Alca torda*) [A200] • Puffin (*Fratercula arctica*) [A204]	Source: NPWS (2022). Conservation objectives for Lambay Island SPA [004069]. First Order Site specific Conservation Objectives Version 1.0. Department of Housing, Local Government and Heritage. Accessed 21st October 2024. To maintain the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA: • Fulmar (*Fulmarus glacialis*) [A009] • Cormorant (*Phalacrocorax carbo*) [A017] • Shag (*Phalacrocorax aristotelis*) [A018] • Greylag Goose (*Anser anser*) [A043] • Lesser Black-backed Gull (*Larus fuscus*) [A183] ^ • Herring Gull (*Larus argentatus*) [A184] ^ • Kittiwake (*Rissa tridactyla*) [A188] • Guillemot (*Uria aalge*) [A199] • Razorbill (*Alca torda*) [A200] • Puffin (*Fratercula arctica*) [A204]	No. There is no potential pathway for likely significant effects arising from this development on this European Site on account of distance. The Broomfield lands do not support breeding bird populations of the Special Conservation Interests of Lambay Island SPA.
004122	Skerries Islands	14.8km north	• Cormorant (*Phalacrocorax carbo*) [A017]	Source: NPWS (2022). Conservation objectives	No. There is no potential pathway

Site Code	Site Name and Designation	Approximate distance from the Broomfield Lands	Qualifying Interest	General Conservation Objectives	Potential for Likely Significant Effects
	SPA		• Shag (*Phalacrocorax aristotelis*) [A018] • Light-bellied Brent Goose (*Branta bernicla hrota*) [A046] • Purple Sandpiper (*Calidris maritima*) [A148] • Turnstone (*Arenaria interpres*) [A169] • Herring Gull (*Larus argentatus*) [A184]	for Skerries Islands SPA [004122]. First Order Site specific Conservation Objectives Version 1.0. Department of Housing, Local Government and Heritage. Accessed 21st October 2024. To maintain the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA: • Cormorant (*Phalacrocorax carbo*) [A017] • Shag (*Phalacrocorax aristotelis*) [A018] • Light-bellied Brent Goose (*Branta bernicla hrota*) [A046] • Purple Sandpiper (*Calidris maritima*) [A148] • Turnstone (*Arenaria interpres*) [A169] • Herring Gull (*Larus argentatus*) [A184]	for likely significant effects arising from this development on this European Site on account of distance. The Broomfield lands do not support breeding or ex situ wintering bird populations of the Special Conservation Interests of Skerries Islands SPA.

5.5 POTENTIAL IMPACTS

Planning permission is sought for the following:

The proposed development subject to this Large-Scale Residential Development (LRD) application provides for the demolition of the former rugby clubhouse structure on site and the construction of 297 no. residential units comprising 211 no. houses (14 no. 2 beds, 156 no. 3 beds, 39 no. 4 beds and 2 no. 5 beds), 46 no. duplex units (9 no. 1 beds, 14 no. 2 beds, and 23 no. 3 beds), 40 no. apartments (23 no. 1 beds, 14 no. 2 beds, and 3 no. 3 beds); 1 no. childcare facility; 1 no. café/restaurant; 1 no. retail unit; 1 no. yoga studio; and all associated site infrastructure and engineering works necessary to facilitate the development. Furthermore, the proposed development provides for a temporary pumping station situated to the southwest of the subject site, in addition to the proposed use of the existing vehicular access off Back Road (proposed vehicular access via Ashwood Hall).

The development of the lands at Broomfield will result in:

- permanent landtake;
- construction activities (e.g. runoff and other pollution, increase of suspended solids, alteration of hydraulic conditions, noise and dust emissions, lighting, movement of vehicles, presence of construction personnel);
- occupation once completed

All areas of grassland and some sections of treelines/hedgerows, shrubs, scrub and trees will be removed during the construction phase. The rugby club building within the site will be demolished.

As detailed in the arboricultural impact assessment (McCorkell, 2024) the proposed development will require the removal of 82 trees, 22 groups of trees/hedgerows, and the partial removal of 5 groups of trees/hedgerows. Of the 109 trees and groups to be removed or partially removed, 10 trees and 1 group are of moderate quality and value (B Category), 49 trees and 26 groups are of low quality and value (C Category), and 23 trees are of poor quality (U Category).

These are shown on **Figure 5.14** and **5.15** below.

Figure 5.14. Tree removals plan (trees shown in solid pink) (Mc Corkell, 2024).

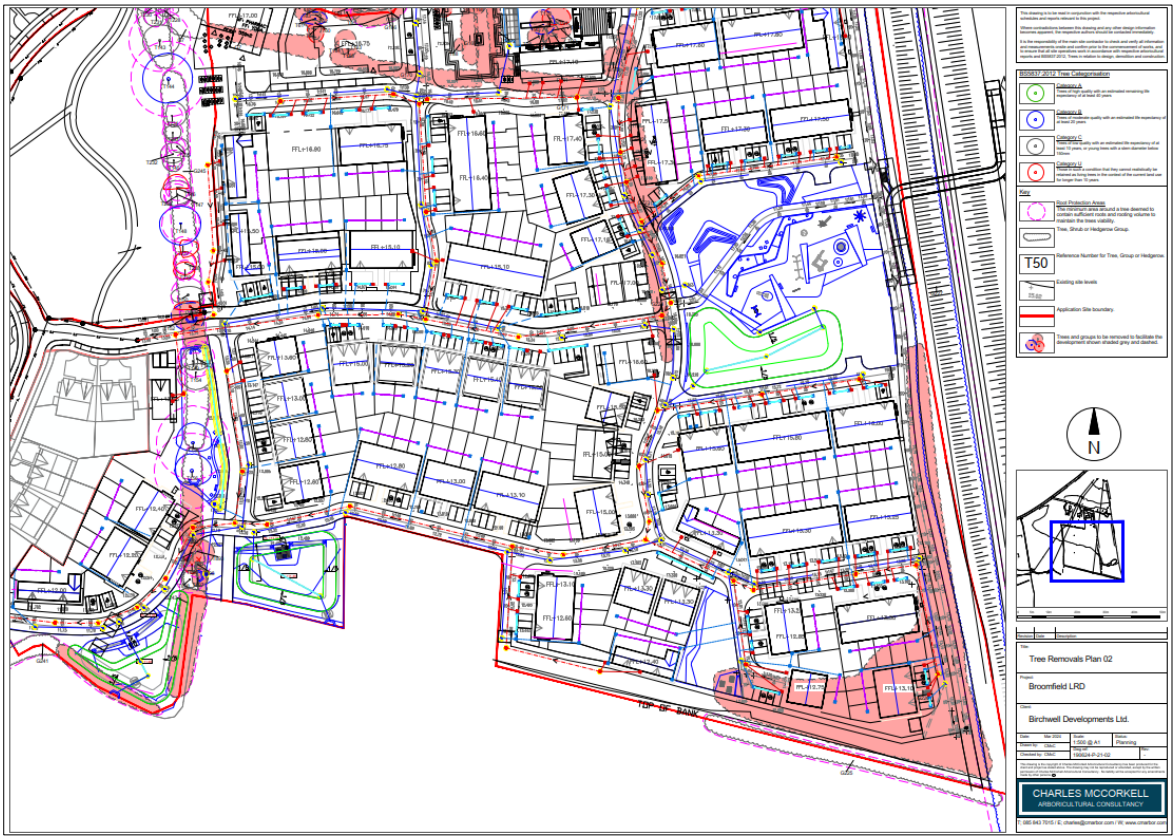

Figure 5.15. Tree removals plan (trees shown in solid pink) (Mc Corkell, 2024).

The other potential impacts during the construction phase arise from the risk of damage to areas of retained vegetation and habitats within the environs of the site. These include the site boundary treelines and hedgerows and drainage ditches, which drain to the Hazelbrook Stream (which ultimately flows to the Baldoyle SAC/SPA).

The old rugby club building contained a confirmed bat roost in 2018. This roost has since been lost following arson of the building, and the building will be demolished as part of the works. The building has not been used by bats for roosting purposes for many years and is no longer suitable for use as a roost. A large number of trees, some of which have potential to support roosting bats, will also be removed.

There will be loss of foraging areas, resting sites and breeding habitat for birds and other fauna arising from the removal of grassland and sections of treelines/hedgerows, shrubs, scrub and trees scheduled for site clearance.

The physical disturbance of the soil within the site will result in the potential for run-off from soil disturbance on the site to the adjoining drainage ditches and ultimately the Hazelbrook Stream and the Baldoyle Bay SAC/SPA unless some remedial measures are put in place. There is also some potential for leaks of oil and petrol from machinery and equipment used on site to enter the Natura 2000 site via this pathway.

During the operational phase of the development there is also potential for contamination of Hazelbrook Stream and ultimately the Baldoyle Bay SAC/SPA from surface water run off from the site.

Foul water from the site will be discharged to the Malahide Wastewater Treatment Plant (WWTP) via the Connolly Avenue pumping station. It is noted that the Connolly Avenue pumping station, the gravity foul water network in Malahide and Malahide WWTP all have had capacity issues during heavy rainfall events.

The lighting design for the scheme could also interfere with the movement of bats and other fauna through the site.

5.6 REMEDIAL OR REDUCTIVE MEASURES

5.6.1 Mitigation by Avoidance

The principal mitigation that should be considered in any development is avoidance of impact. The site layout has been designed to avoid impacts on the boundary treelines and hedgerows surrounding the site.

5.6.2 Planting of Native Species

The landscape architects for the project KFLA set out the following in their landscape strategy for the site from the perspective of biodiversity:

'All of the various landscape spaces and typologies in this development have been designed to consider local biodiversity and ecology. Maintaining and creating natural habitats for native flora and fauna and creating ecological networks is an essential element of the landscape strategy.

Retaining and strengthening existing native vegetation, as well as proposing new native woodland, creates biodiversity rich, native habitats and ecological green corridors which run through the site and link with external landscape features. The majority of vegetation on site is that of a parkland landscape and can be found along the site boundaries and has been retained wherever possible. Where vegetation that is contributing to wildlife corridors and green infrastructure has been removed or fragmented, replacement planting as specified above has been proposed to compensate for any loss.

Hedgerow and woodland planting along site boundaries creates dense belts of native spaces which act as native habitat and similarly to the native hedgerows, form ecological corridors which connect with other landscape elements throughout the site. The retained boundary hedgerows are important in maintaining the ecological integrity of the site.

The introduction of wildflower meadow through certain open spaces within the site provides new habitats for local flora and fauna and helps to increase biodiversity in the local area. The strategies referenced above protect and enhance the character of the natural environment in the area and contribute to the scenic quality of the surrounding landscape. They also ensure that habitats and areas of high value biodiversity are protected'.

Native species appropriate to the area (such as hawthorn, elder, ash, alder, holly, hazel, willows, oak, dog rose, gorse and bramble) have been used within the landscaping plans for the development.

These will, as they mature, provide a food source, shelter and habitat for foraging bats, nesting habitat for birds and a food source for pollinators. All species used will be of certified native origin and sourced locally to ensure genetic provenance to the area – certified material is available from the forestry nurseries who supply the native woodland scheme.

All planting within gardens and public spaces within the scheme will be pollinator friendly as per the All Ireland Pollinator Plan.

5.6.3 Protective Measures for Retained Treelines, Hedgerows & the Drainage Ditch

The hedgerows and treelines, which form the existing site boundaries to the east and west, are to be retained. The drainage ditch along the southern boundary of the site will also be retained.

These retained treelines, hedgerows, and associated drainage ditches will be given protection from accidental damage by machinery during site works prior to any works commencing in the development and as set out in the arboricultural impact statement. **These areas will be clearly delineated by fencing or other measures. Fences will be erected outside the drip-line or canopy of each tree in accordance with BS 5837 (2012) – Trees in Relation to Construction.** Please refer to the arboricultural tree protection drawings (**Figures 5.16** and **5.17** below).

Figure 5.16. Tree Protection Drawing (Mc Corkell (2024)).

Figure 5.17. Tree protection Drawing (Mc Corkell (2024)).

5.6.4 Invasive Species

The primary species of concern is Japanese knotweed as this is listed under the Third Schedule of the Communities Birds and Natural Habitats Regulations 2011. An invasive species management plan has been prepared to deal with the Japanese knotweed stands as shown on **Figure 5.5** above. The most recent surveys indicate that the treatment has been successful with no evidence of above ground growth of the species and no spread however a precautionary approach to the possibility for viable rhizomes to remain below the soil has been taken.

A detailed plan for the excavation and screening of soil into a container/large skips and disposal off site has been developed (ESC 2024).

The other populations of non-native invasive species within the site (Butterfly bush, Snowberry bush and Canadian fleabane) will be clearly demarcated prior to works commencing, removed and disposed off site to landfill.

There is also potential for Japanese knotweed and other invasive species to spread/become established within the development site through poor site management or the import of contaminated topsoil so any material brought to site must be certified that it is free of invasive species.

5.6.5 Mitigation Measures for Badgers

An inactive badger sett is located at the southern end of the eastern boundary treeline (adjoining Ashwood Hall) within the site in the vicinity of O 22265 44683 and a disused sett is located in the treeline north of the rugby club building as shown on **Figure 5.6** above.

Both of these setts have been the subject of regular examination to determine their use by badgers and whilst they have not been used for many years there is a possibility that they could be again. Furthermore some time may have passed between this application and works commencing if planning permission is granted.

Badgers and their setts are protected under the provisions of the Wildlife Act, 1976, and the Wildlife Amendment Act, 2000. It is an offence to intentionally kill or injure a protected species or to wilfully interfere with or destroy the breeding site or resting place of a protected wild animal. Exclusion of badgers should only be considered where a development would unavoidably destroy a badger sett (or any part of its underground tunnel and chamber system), or its immediate surroundings, making it unsuitable for continued occupancy.

Construction works such as those proposed within the Broomfield LRD lands, which occur within the vicinity of a sett (albeit inactive/disused) may require a licence should the setts become active. It should be noted that all activity related to badger surveys, evacuation procedures and sett destruction should only be undertaken by personnel with recognised expertise in badger ecology.

Monitoring

Given that some time may have lapsed between approval of planning permission and commencement of construction the activity at these setts will be the subject of ongoing monitoring in order to determine if a licence could become a requirement.

Southern Sett

The former badger sett (at the southern end of the eastern boundary treeline (adjoining Ashwood Hall)) will not be directly impacted by the proposed Broomfield LRD and both it and the treeline in which it is located will be retained as part of the scheme. The proposed housing layout and internal access roads were redesigned during Phase 1 to ensure that these parts of the lands were retained as part of a wildlife corridor through the property and the sett was not directly impacted.

Both this treeline and inactive badger sett will be afforded protection as set out in the arborist's report and accompanying drawing (see **Figure 5.18** below) to ensure that the retained trees, vegetation and sett are not damaged by the construction works. Any fencing measures deployed must incorporate access for mammals at the base – this should be a gap no smaller than 300mm high by 225mm wide. This will be inspected and signed off by the ecological clerk of works.

Figure 5.18. Badger protection zone – southern sett.

Badgers and other wildlife will continue to use established paths across a site even when construction work has started. Therefore during construction, any open trenches/excavations will incorporate facilities for badgers (and other wildlife, such as rabbits, foxes, hedgehogs etc.) to escape, by means of the following:

1. Gently sloping earth incline to be left at the end of each day's operation – at each end of open excavations/trenches.
2. Timber escape planks should be provided at c. 50m intervals along any deep excavations/trenches and these should be left in place at the end of each day's operations; these should usually be placed at right-angles to the excavation/trench.
3. Any temporarily exposed open pipe system should be capped in such a way as to prevent badgers gaining access as may happen when contractors are off site.

Northern Sett

The potential sett located to the north of the rugby club building has been the subject of monitoring to determine activity and the results of these surveys would indicate that a license is not required and that the potential sett remains inactive. Ongoing monitoring will take place in order to determine if a licence could become a requirement.

Scrub Clearance

The area of scrub south of the rugby club building could not be fully surveyed for mammal activity and site clearance in this area will be supervised by an ecologist to ensure protection of same.

5.6.6 Mitigation Measures for Bats

5.6.6.1 Rugby Club Building Demolition

The rugby club building was confirmed in 2018 as a roost for 2-3 common pipistrelle and soprano pipistrelle bats and a bat derogation licence was previously provided for the proposed demolition by National Parks and Wildlife Service. The building no longer supports roosting bats and is unlikely to do so given the damage inflicted by the fire and subsequent dereliction so a bat derogation licence is no longer required.

Building Resurvey

Given that some time may have lapsed between approval of planning permission and commencement of construction the rugby club building will be resurveyed for bats prior to any proposed demolition works. A precautionary approach to the demolition of the building can then be prepared whereby any remaining potential roosting location for bats are manually removed. This work will be supervised by a licensed bat specialist who can deal with any bats present and will be done during the winter months.

Provision of Bat Boxes

Fifteen bat boxes shall be erected on suitable buildings or trees (i.e. not illuminated and above 3 metres height and close to green areas) within the development. The most successful box types are "woodcrete" boxes made by Schwegler and available from www.alanaecology.com. Several designs are available including some of which can be incorporated into the walls and the surface fabric of new buildings.

5.6.6.2 Vegetation Retention and Protection

The other main protective measure for bats is the retention of the boundary hedgerows, treelines, and the drainage ditch along the southern boundary of the site and protective measures will be put in place for these features during the construction period. The use of native species in the landscaping proposals for the site will also assist in ensuring that bats continue to forage and remain in the area.

5.6.6.3 Lighting Design

Sensitivity in the provision of lighting is also important to ensure that bats continue to use the site. The retained hedgerows, treelines and drainage ditch and newly created areas of planted vegetation will be retained as dark zones and the amount of lighting shining on such areas limited.

Design recommendations for wildlife-friendly lighting include:

1. Do not "over" light. This is a major cause of obtrusive light and is a waste of energy. Use only the minimum amount of light needed for safety. There are published standards for most lighting tasks, adherence to which will help minimise upward reflected light.
2. Eliminate any bare bulbs and any light pointing upwards. The spread of light should be kept near to or below the horizontal.
3. Use narrow spectrum bulbs to lower the range of species affected by lighting.

4. Use light sources that emit minimal ultra-violet light. Insects are attracted to light sources that emit ultra-violet radiation.
5. Reduce light-spill so that light reaches only areas needing illumination. Shielding or cutting light can be achieved through the design of the luminaire or with accessories, such as hoods, cowls, louvers and shields to direct the light.
6. Reduce the height of lighting columns. Light at a low level reduces ecological impact. However, higher mounting heights allow lower main beam angles, which can assist in reducing glare.
7. For pedestrian lighting, use low level lighting that is directional as possible and below 3 lux at ground level.
8. Limit the times that lights are on to provide some dark periods for wildlife.
9. Use lighting design computer programs and professional lighting designers to predict where light spill will occur.
10. In general any lighting used in the development should not overspill onto adjoining trees, hedgerows, and the drainage ditch thereby ensuring that a dark corridor for foraging and commuting bats and movement for other wildlife is maintained.

In addition:

11. Luminaires will be dimmable LED (light emitting diode) fittings with High performance optics to provide high visual comfort.
12. Luminaires will be selected to ensure that when installed there shall be zero direct upward light emitted to the sky (all output shall be at or below 90º to the horizontal to help prevent sky glow from light pollution of the night sky).
13. Luminaires will be selected to ensure that there is no light spill from the proposed development onto the retained areas of linear vegetation and boundary features.
14. The light emitted from these fittings shall have no photo biological risk and shall be categorised as “Exempt Group” in relation to emissions of Blue light, Infrared and Ultra Violet Radiation in accordance with EN 62741:2008.
15. All luminaires shall have a Luminous intensity Classification of between G4 and G6 to IS EN 13201-2:2003(E) / BS 5489-1:2013.
16. The recommendations of the Institution of Lighting Professionals and Bat Conservation Trust “Bats and Lighting in the UK” documentation and Bat Conversation Ireland Guidance Notes for planners, engineers, architects and developers December 2010 will be met.

Further detailed information on lighting design for bats and other wildlife is presented in the document prepared by the Bat Conservation Trust and the Institute of Lighting Professionals ‘BCT (2018). Guidance Note 08/18 - Bats and artificial lighting in the UK. Bats and the Built Environment series’ and the EUROBATS Guidance available from:

https://cdn.bats.org.uk/pdf/Resources/ilp-guidance-note-8-bats-and-artificial-lighting-compressed.pdf?mtime=20181113114229&focal=none and

https://cdn.bats.org.uk/pdf/Resources/EUROBATSguidelines8_lightpollution.pdf?mtime=20181113114256&focal=none

These guidelines have been implemented in the previous phases of the developments at Broomfield and in the project lighting design as set out in **Figure 5.19** below.

Figure 5.19. Project lighting design.

Plate 18. A dark corridor for foraging bats and other wildlife has been maintained along the shared boundary treeline with Ashwood Hall.

5.6.6.4 Felling of Potential Bat Roosts in trees

All trees proposed for removal will be subject to appropriate felling measures as detailed in NRA Guidelines for the Treatment of Bats during the Construction of National Road Schemes (National Roads Authority 2006). The felling/clearance of trees will be scheduled for the autumn months of September/October when bats are less likely to be using trees. This also avoids the bird breeding season.

Prior to tree felling works the trees will be inspected by a licensed bat specialist in the presence of the tree surgeons and an appropriate felling methodology agreed.

The felling of those trees, which have been identified as potential bat roosts, must be supervised by a bat specialist holding a bat handling licence issued by the National Parks and Wildlife Service, (Department of Environment, Heritage and Local Government). If bats are encountered they should be removed by the licence holder to a bat box, to be sited on a nearby tree and the NPWS notified and a bat derogation licence sought.

Identified trees must be felled carefully. Specific advice in relation to individual trees will be given on site by a bat specialist. Gradual dismantling of some mature trees may be necessary to ensure the safety of any bats which may be roosting within significant sized boughs or in the trunk. The tree will be inspected by a bat specialist, and depending on the structure of the tree they may need to be left intact on the ground for 24 hours to allow any bats within them to escape prior to processing.

5.6.7 Mitigation Measures for Birds

As detailed in the arboricultural impact assessment (Mc Corkell, 2024) the proposed development will require the removal of 82 trees, 22 groups of trees/hedgerows, and the partial removal of 5 groups of trees/hedgerows. Of the 109 trees and groups to be removed or partially removed, 10 trees and 1 group are of moderate quality and value (B Category), 49 trees and 26 groups are of low quality and value (C Category), and 23 trees are of poor quality (U Category).

No clearance of vegetation shall be carried out from March 1st to August 31st (except in circumstances of immediate danger to the public). This will protect nesting birds, eggs and nestlings from injury or death. No clearance of vegetation suitable for nesting birds within the site (shrubs, bramble tangles, etc.) will take place during this period. Should such clearance be required than the area proposed for clearance should be inspected by an ecologist to ascertain if any nesting birds are present.

Provision of Bird Boxes

Forty bird boxes of varying designs will be erected on suitable buildings or trees within the development. Several designs are available including some which can be incorporated into the walls and the surface fabric of the new buildings. These include integrated designs for swift, house sparrow, swallows, starling, etc. Suitable locations for these will be agreed by the project ecologist with the architect and set out for the contractor on detailed drawings.

5.6.8 Drainage Ditch Restoration

It is proposed to naturalise the drainage ditch along the southern boundary of the site and to enhance it for wildlife through suitable planting.

Suitable species for planting along the drainage ditch have been specified by the project ecologist to the landscape designer.

Care should be taken when purchasing aquatic plants from nurseries as many species have the potential to become invasive. Attention is drawn to the invasive species listed under the Birds and Natural Habitats Regulations 2011.

5.6.9 Sediment Control

Sediment control practices are used on building sites to prevent sand, soil, cement and other building materials from reaching drainage ditches and watercourses such as the Hazelbrook Stream and water dependent habitats such as the reedbeds and saltmarshes in Baldoyle Bay downstream. Even a small amount of pollution from a site can cause significant environmental damage by killing aquatic life, silting up streams and blocking storm water pipes. Storm water can contain many pollutants which can enter our local drainage ditches, streams, rivers and marine systems, causing harm to native animals, plants, fish breeding habitats and recreational areas.

Soil erosion, sediment and litter from building sites can be major sources of storm water pollution, and can cause:

- significant harm to the environment e.g. loss of valuable foraging areas in adjoining mudflats for wintering birds
- weed infestation of waterways caused by sediment settling on the creek beds and transporting nutrients
- loss of valuable topsoil
- significant public safety problems when washed onto roads and intersections
- blocked drains creating flooding and increased maintenance costs
- damage to recreational and commercial fishing.

Sediment control usually requires little effort and results in:

- Cleaner waterways and healthier aquatic life.
- Improved site conditions.
- Improved wet weather working conditions.
- Reduced wet weather construction delays.
- Reduced losses from material stockpiles.
- Fewer mud and dust problems.

Good site management in relation to sediment control during the construction phase should prevent this from occurring and possible mitigation measures for consideration are outlined below. Other measures to be implemented on site include briefing of all site contractors regarding the sensitivity of the adjoining drainage ditches and the need for strict site management in relation to potential run off.

Minimising site disturbance:

Prevention is better than cure. Careful design and an efficient construction sequence will minimise disturbance to the site. This will save money and reduce environmental impact.

Design to avoid excessive cut and fill, unnecessary clearing of vegetation and to preserve existing site drainage patterns. Clear only those areas necessary for building work to occur. Preserve grassed areas and vegetation where possible. This helps filter sediment from storm water run off before it reaches drainage ditches and stops rain turning exposed soil into mud. Delay removing vegetation or commencing earthworks until just before building activities start. Avoid building activities that involve soil disturbance during periods of expected heavy or lengthy rainfall.

Implement sediment control:

Install sediment control measures before commencing any excavation or earth moving. Regularly maintain them until construction is complete and the site is stabilised.

Prevent sediment-contaminated water leaving the site

Use barriers to trap coarse sediment at all points where storm water leaves the site, before it can wash into drainage ditches and down to the Natura 2000 site downstream. Relocate sediment on site or dispose of it suitably. Remove accidental spills of soil or other material immediately. Maintain vegetation on the site in the vicinity of drainage ditches in a healthy state so it can function as an additional filter for sediment. Cut brick, tile or masonry on a pervious surface such as grass or loosened soil within the property boundary. The same applies when cleaning equipment. Waste concrete, paint and other solutions used on site should be properly disposed of so they do not contaminate storm water.

5.6.10 Protection Measures for Aquatic Habitats

Various measures will be required to ensure that there is no deterioration in water quality in the drainage ditch along the southern boundary of the site arising from the development as this will ultimately drain towards the Hazelbrook Stream and the Sluice River.

These measures relate mainly to the control of silt and sediment runoff during construction and the installation of hydrocarbon/petrol interceptors on surface water drainage systems leaving the development. There are no instream works proposed.

5.6.11 Contractor Briefing

All site contractors will be briefed by the ecological clerk of works regarding the biodiversity value of the retained drainage ditch, trees and vegetation to ensure that there are no accidental or unintentional actions conducted during the project construction that could lead to a reduction in water quality/damage to same. Such matters often arise through ignorance or by accident rather than as a result of an intentional action.

5.6.12 Soil Handling

Soil should be handled with care as it is a living entity. The topsoil and subsoil layers will be stripped, stored and maintained separately. Topsoil will be temporarily stored upon geotextile such as Terram 1000 (www.terram.com). The contractor should submit proposals for supplier and product, which should be a nonwoven geotextile manufactured from UV stabilised, high tenacity, virgin polypropylene fibres that have been both mechanically and thermally bonded with a minimum of 5 years lifespan in all soil conditions. Note that soil levels within the root spread of those trees that are to be retained should not be raised. From this temporary storage heap the topsoil should be distributed as required for landscaping purposes. In general the topsoil should not be firmed, consolidated or compacted when laying. Tipping and grading to approximate levels should be done in one operation with minimum of trafficking by plant.

The topsoil, which is to be retained and reused should not be mixed with: subsoil, stone, hardcore, rubbish or material from demolition work, or the other grades of topsoil, including those contaminated with non-native invasive species. The topsoil should be handled in the driest condition possible. Topsoil should not be handled during or after heavy rainfall or when it is wetter than the plastic limit less 3%, to BS 1377-2.

Depending on how long the construction period is expected to last it might be necessary to seed the stored topsoil to prevent weed establishment. A recommended mixture is: 35% Chewings fescue, 35% Slender red fescue, 20% Smooth stalked meadow grass and 10% Brown top bent. This should be applied to the manufacturer's recommendations (min. 15g/m2) and the following wildflower mix @ 5g/m2 added:

- Native Origin Irish Wildflower Seed Mixture - Product Code/Name: MM12 Wild Flora for Raw Impoverished Sub Soil
- Supplier: Design by Nature www.wildflowers.ie
- Species List: Bird’s-foot Trefoil, Black Medick, Corn Marigold, Corn Pansy, Corn Poppy, Corncockle, Cornflower, Cowslip, Devil's Bit Scabious, Eyebright, Meadow Buttercup, Fleabane, Greater Trefoil, Lesser Knapweed, Scented Mayweed, Meadowsweet, Ox-eye Daisy, Purple Loosestrife, Ragged Robin, Red Rattle, Red Bartsia, Red Clover, Ribwort Plantain, Rough Hawksbit, Sorrel, St. John’s-wort, White Campion, Wild Angelica, Wild Carrot, Yarrow, Yellow Rattle, Lady's Smock, Yellow Clover.

5.6.13 SUDS Measures

The drainage system has been designed with the aim of providing a sustainable drainage solution ensuring, in so far as feasible, that the development has a minimal impact on the existing public surface water sewer system. The proposed development has been designed to incorporate best drainage practice.

It is proposed to incorporate a Storm Water Management Plan through the use of various SuDS techniques to treat and minimise surface water runoff from the site. This has been designed by Waterman Moylan Consulting engineers (see the Engineering Assessment Report).

Surface water from the site currently discharges into a series of boundary ditches on the perimeter of the site. Part of the site's drainage ditch network on the southern boundary is a static/dry ditch which falls towards the railway line which has a culvert connecting to a ditch on the east of the railway line. There is also a north-south ditch running along the west of the site which flows south westwards under a 1.5m x 2.1m box culvert under Brookfield Road and then via two 1050mm diameter culverts around the existing Brookfield residential development to a 450mm diameter culvert under Kinsealy Lane before connecting to the Hazelbrook Stream and ultimately the Sluice River.

It is proposed to construct a surface water drainage network that will service and attenuate the development internally before discharging at the current greenfield (or allowable) rates to the local natural ditch systems. Surface water drainage layout and attenuation strategy can be reviewed on Waterman Moylan drawing numbers 18-091-P3200, P3210 and P3211.

For storm water management purposes, the site is proposed to be divided into 5 no. separate catchments, each with their own attenuation basins, cascading to 2no. outfall headwalls, as shown in **Figure 5.20**.

Potential negative impacts could arise should untreated surface water enter the Hazelbrook Stream from the proposed development. These impacts have been addressed through careful consideration of the ground conditions within the site and the installation of silt traps and hydro-carbon traps as outlined in the Engineering Assessment Report and accompanying drawings prepared by Waterman Moylan Consulting Engineers, which will ensure that all surface water leaving the site is treated before it ultimately enters the Baldoyle Bay SAC/SPA.

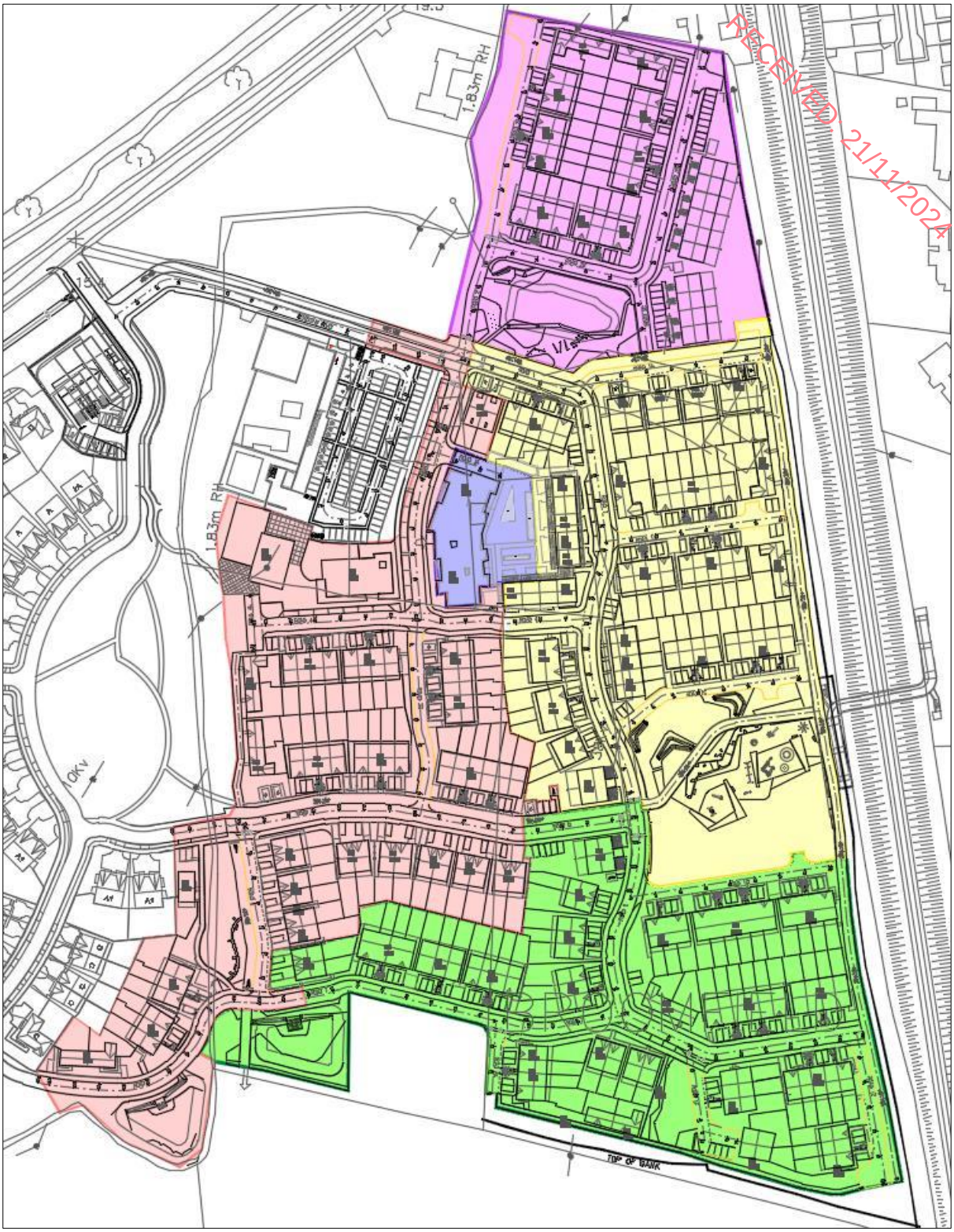

Figure 5.20 Indicative layout of the drainage network (Waterman Moylan, 2024).

5.6.14 Ecological Clerk of Works

An ecological clerk of works will be appointed to oversee the project and sign off on the above mitigation measures.

5.7 A DO NOTHING SCENARIO

Under a 'do-nothing' scenario the northern lands would continue to be unmanaged and ungrazed rank grassland would continue to develop and over time would become dominated by brambles and colonising species such as willow and oak which is currently happening on site. This would develop into and be replaced by scrub and ultimately woodland over time.

5.8 WORST CASE SCENARIO

Under a worst-case scenario none of the mitigation measures recommended will be implemented during the construction phase when the main damage and losses to local biodiversity can occur.

It is for this reason that an ecological clerk of works is to be appointed to brief the contractor and oversee same.

5.9 PREDICTED IMPACT OF THE PROPOSED DEVELOPMENT

The overall impact on flora and fauna within this site is deemed moderate negative as they are undeveloped and offer ecological structure and diversity. They currently provide habitat for wildlife in what is becoming an increasingly urbanised area along Back Road. This will be permanently altered and lost through their development for residential purposes.

This land is zoned for Residential Development and is identified as such within the Fingal County Council Development Plan. As such residential development will occur on this site and the environment on the site will change.

The proposed development retains and enhances some of the natural features of the site where possible and includes positive planting proposals which will add some diversity to the site which will favour some species.

5.10 CONCLUSION

The proposed construction of a large-scale residential development on the Broomfield lands at Back Road has been assessed from the perspective of ecology and detailed mitigation measures have been presented to reduce impacts on same in the vicinity of the proposed development and surrounding lands.

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6.0 Land & Soils

6.1 Introduction

This section of the Environmental Impact Assessment Report (EIAR) has been prepared by Waterman Moylan Consulting Engineers and provides an assessment of the impact that the proposed Large-scale Residential Development (LRD) of the Northern lands at Broomfield, Malahide, Co. Dublin will have on the surrounding soil and geology within the vicinity of the site. It also sets out mitigation and remedial measures and methods of monitoring once the development is operational.

6.2 Research Methodology

A Desktop study to classify the geological features related to the site was undertaken. The Geological Survey of Ireland (GSI) was consulted, and the following maps reviewed:

- Bedrock Geology Map
- Bedrock Aquifer Map
- Groundwater Vulnerability Map

This information was further supplemented by geotechnical site investigations carried out by Site Investigations Ltd. in March 2021 and by Ground Investigations Ireland Ltd. in April 2020. These reports are included as appendices to this document.

6.3 Receiving Environment

6.3.1 Site Location and Topography

The subject land is located at Broomfield, Malahide, Co. Dublin. The subject site is bound to the west by Ashwood Hall Residential development, to the east by the Dublin-Belfast Rail line, the north by existing residential units fronting onto the Back Road, and to the south by agricultural land.

The subject site will primarily be accessed via the existing junction to Back Road serving the Ashwood Hall residential development. An additional access will be provided for Kinsealy Lane via the Hazelbrook residential development.

A topographic survey of the area indicated that the subject site generally slopes uniformly from north-east to south, from a height of 20.500m to 11.500m OD Malin, with an existing dry ditch system along the south-east boundary, and ditch to the south-west.

The existing dry ditch on the southern boundary of the site serves the subject site only due to topography, water flowing to this ditch is percolated locally and there is no connection to any watercourse. The drainage ditch to the south-west eventually connects to the Hazelbrook stream. Hazelbrook stream is a tributary of the Sluice River with an ultimate outfall to Baldoyle Bay.

The location of the subject site is as indicated in Figure 6.1 below:

Figure 6.1 | Site Location (Source: Google Earth)

6.3.2 Desktop Study

The subject site is predominantly greenfield and was the former location of a rugby club. There is a small area of hardstanding which was previously the club's car park, together with existing structures, formerly the clubhouse and outhouse. These structures have been extensively vandalised in the form of fire damage, and demolition of the remainder of the structures is included as part of the subject site.

Geological Survey Ireland (GSI) produces a wide range of datasets, including bedrock geology mapping, extracted below in *Figure 6.2.*

The map indicates that the site lies within the Tober Colleen Formation.

The Tober Colleen Formation is described as a calcareous shale and limestone conglomerate. The formation is comprised of dark-grey, calcareous, commonly bioturbated mudstones and subordinate thin micritic limestones, with a thickness of 50m to 250m.

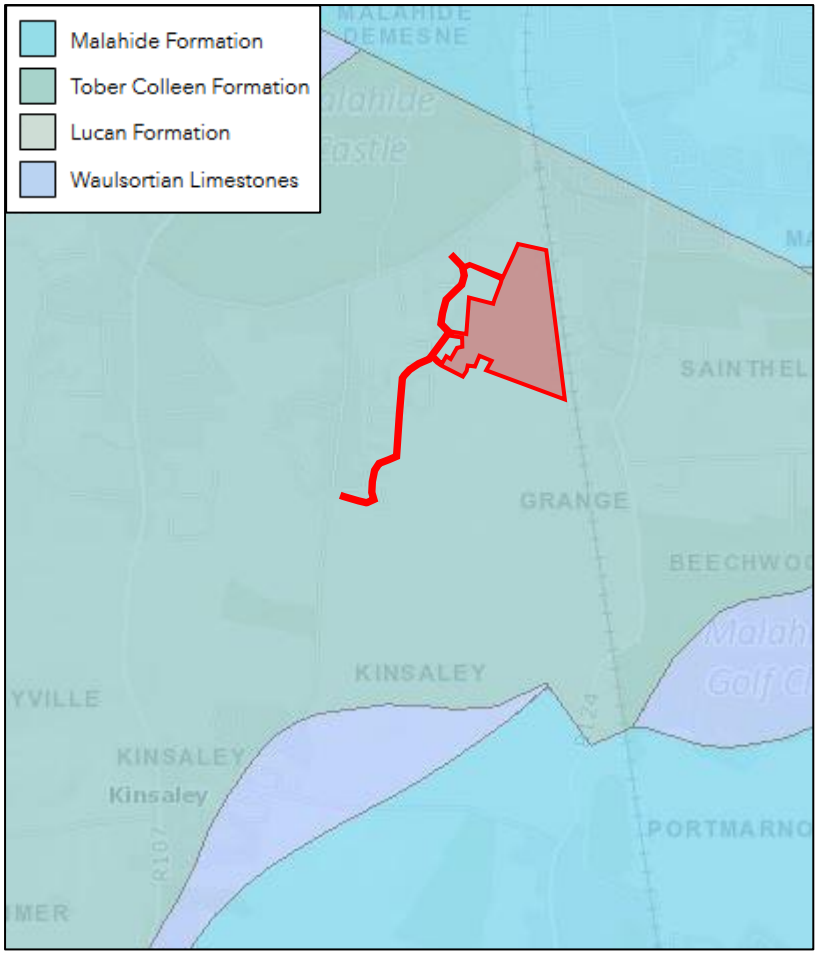


Figure 6.2 | Extract from GSI Bedrock Geology Map

The national Aquifer Bedrock Map prepared by the Geological Survey of Ireland was consulted and is extracted in *Figure 6.3*, overleaf.

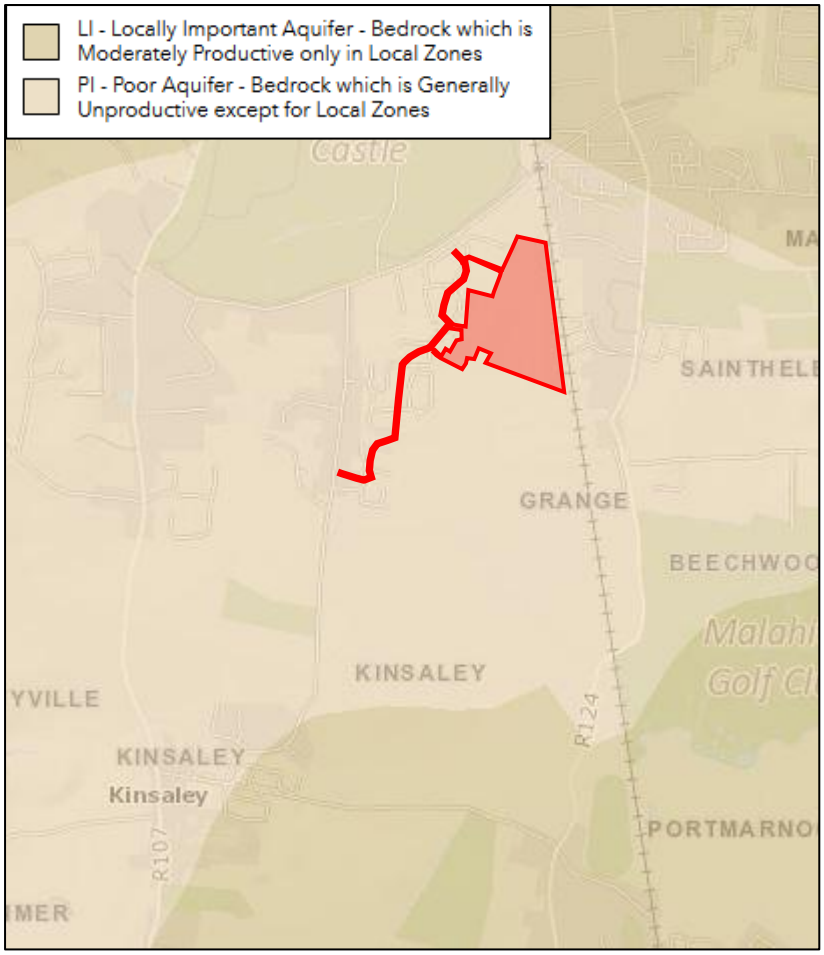


Figure 6.3 | Extract from GSI Bedrock Aquifer Map

From the above map extracts the site lies within the Tober Colleen Formation which has a designation of PI, which represents Poor Aquifer qualities, where the bedrock is generally unproductive except for local zones.

The groundwater vulnerability in the vicinity of the proposed site was also examined by referencing the Geological Survey of Ireland. From the GSI groundwater vulnerability map, extracted overleaf, the site lies within an area of high to extreme groundwater vulnerability.

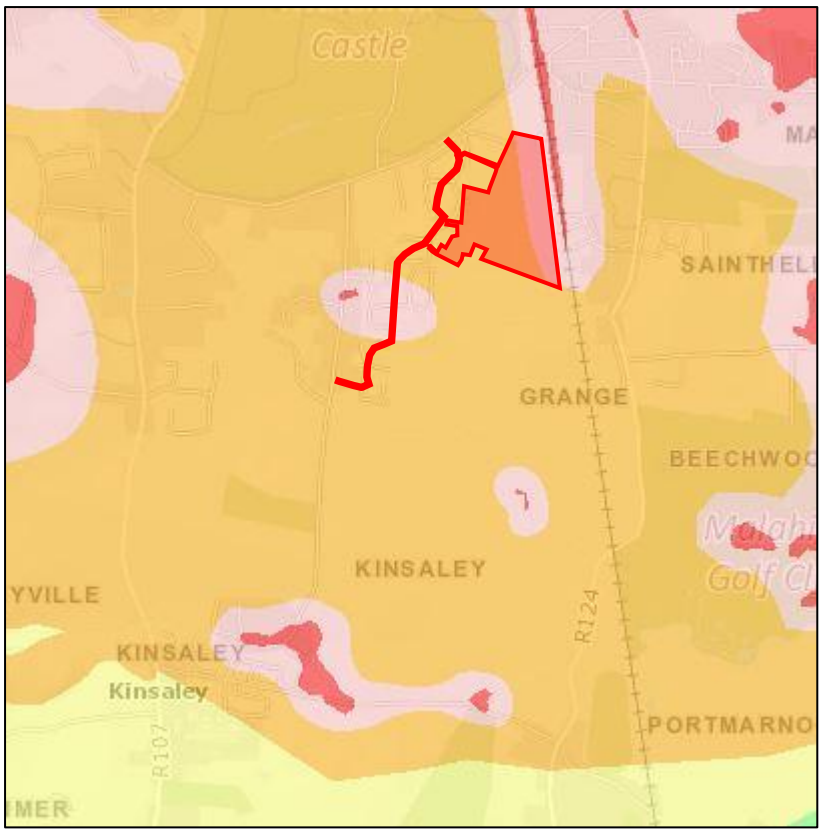


Figure 6.4 | Extract from GSI Groundwater Vulnerability Map

6.3.3 Site Investigations

Site investigations for the site was carried out by Site Investigations Ltd. in March 2021. The fieldworks comprised a programme of 12 no. trial pits with dynamic probes and soakaway tests. The locations are indicated on the figure overleaf.

Trial pits were excavated using a tracked excavator, and representative disturbed bulk samples were returned to the laboratory for geotechnical testing. Geotechnical laboratory testing was completed in accordance with BS 1377 (1990). The suite of testing included moisture contents, Atterberg limits, and particle size gradings tests.

Soakaway tests were also undertaken on 50% of the trial pits. The pit was filled with water and the level of groundwater recorded over time. As stipulated by BRE Special Digest 365, the pit should be filled 3 times and that the final cycle is used to provide the infiltration ratio. The time taken for the water level to fall from 75% volume to 25% volume is required to calculate the rate of infiltration. However, if the water level does not fall at a steady rate, then the test is deemed to have failed, and the area is unsuitable for stormwater percolation.

Figure 6.5 | Trial Pit (TP) & Soakaway (SA) Locations for the Subject Site Reports

The results of the site investigations are summarised as follows:

The natural ground conditions are consistent across the site with cohesive firm brown slightly gravelly silty clay with medium cobble overlying stiff black slightly sandy slightly gravelly silty clay with medium cobble and low bounder content.

Groundwater was not encountered during the excavations.

Soakaway tests 01 & 03 were considered failed. The unsuitability of the soils for soakaways is further suggested by the soil description of the material in this area of the site i.e., clay.

6.3.4 Detailed Site Investigation Report

A more detailed localised Site Investigation Report was undertaken by Ground Investigations Ireland (GII) in April 2020 for a specific area of the site, located in the south-east corner, which was known to be an area of historic in-fill. This report identified the area and depth of infill and conducted extensive chemical analysis to ascertain the requirements for its safe excavation and disposal prior to construction.

This area specific Site Investigation comprised 14 no trial pits, 3 no. slit trenches, collection of surface water and waste/subsoil samples for chemical analysis, Environmental laboratory testing, waste classification and assessment of subsoil quality against Human Health Generic Assessment Criteria (GAC).

The trial pits and slit trenches were both excavated using a 12T tracked excavator. Trial pits (TP) 01-09 were excavated in the area known to be the historic infill area. The slit trenches were undertaken at select locations to confirm the northern lateral extent of the in-fill area. Trial pits 10-14 were utilised to assess the typical undisturbed (by historic in-fill) ground conditions of the subject area.

The image in Figure 6.6 overleaf, is extracted directly from the GII report and shows the location of the trial pits (TP), and slit trenches (ST), as well as indicating the area of the historic landfill with a purple hatch. Also noted with the yellow hatch is an area with Japanese Knotweed which when identified was immediately fenced off to prevent further accidental spread by inadvertent local excavations.

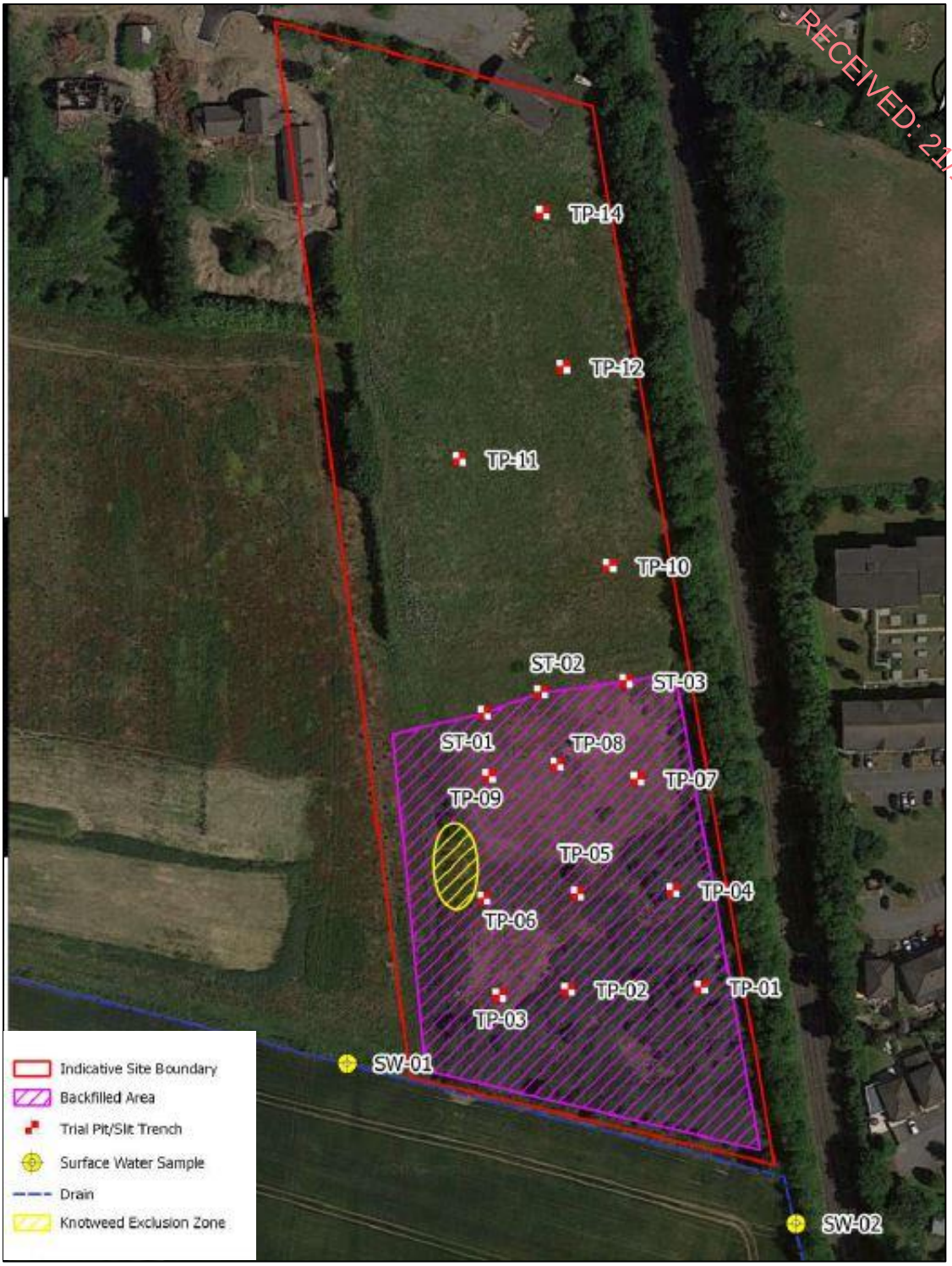


Figure 6.6 | Extract of Mapped Location from the GII Report

The results of the Detailed Site Investigation Report are as follows:

Topsoil

Topsoil was encountered at all the Trial Pits outside the backfilled area and at 4 locations within. Topsoil was present to a maximum depth of 0.3m BGL (Below Ground Level).

Made Ground

Made ground deposits were encountered beneath the topsoil or from the surface in the backfilled area of the site. The made ground was comprised of brown silty sandy clayey fine to coarse subangular to subround gravel with occasional subangular to subrounded cobbles and boulders and occasional fragments of plastic, timber, red and yellow brick, slate, foam, metal, cloth, Wavin pipe and concrete. There was no evidence of potentially hazardous waste such as hydrocarbon-based material, asbestos containing waste, clinical waste, or household waste.

Cohesive deposits

Cohesive deposits were encountered beneath the made ground or topsoil and were described typically as brown silty slightly very gravelly clay with occasional subangular to subrounded cobbles and boulders. The secondary sand and gravel constituents varied across the site and with depth, with granular lenses occasionally present in the glacial till mix.

Surface water assessment

There was no evidence of contamination noted during the collection of the surface water sample. i.e., hydrocarbon, odour, or iridescence etc. at the 2 locations as show in Figure 6.6.

Laboratory analysis was completed by Element Material Technology based in the UK and is a UKAS accredited lab. Analytical methodologies are all to ISO/CEN approved standard or equivalents. Samples were tested for dissolved arsenic, boron, cadmium, copper, chromium, cyanide, lead, mercury, nickel, manganese and zinc, aliphatic and aromatic petroleum hydrocarbons, polycyclic aromatic hydrocarbons (PAH), methyl tert-butyl ether (MTBE), benzene toluene ethylbenzene and toluene (BTEX), total phenols, pH, electrical conductivity, nitrate, nitrite, chloride, sulphate, ammonia, BOD, COD, total suspended solids, and potassium. The parameter range was based on the site history and the need to establish a comprehensive environmental baseline for the surface water quality for the site.

The results of the lab analysis do not show any significant impact from the waste body on the surface water however the following points are noted:

- The levels of Ammonia detected in both surface water samples is above the EQS (Environmental Quality Standards).
- The level of Chromium increased between SW-01 and SW-02. The downstream level exceeded the AA-EQS (Annual Average – EQS) but was within the MAC-EQS (Maximum Acceptable Concentration – EQS).
- PAHs, petroleum hydrocarbons and the BTEX compounds were not detected in the surface water samples.

Made ground assessment

In order to assess materials, to be excavated and removed from site, in terms of waste classification, a selection of samples collected were analysed for a suite of parameters which allows for the assessment of the soils in terms of total pollutant content for classification of materials as hazardous or non-hazardous (RILTA suite). The suite also allows for assessment of solids for placement at various categories of landfill. The RILTA suite also includes those parameters as specified in the EU Council Decision establishing criteria for the acceptance of waste at landfills (Council Decision 2003/33/EC), for which the soil samples are tested for pH, Total Organic Carbon (TOC), speciated aliphatic and aromatic petroleum hydrocarbons, BTEX, Phenol, polychlorinated biphenyl (PCB) and PAH.

Asbestos fibres were detected in the samples of waste material encountered in TP-01, 02, 03 & 06. The asbestos type encountered in all instances was chrysotile, the levels detected were below the laboratory detection limit of <0.001%. The laboratory did not identify asbestos containing material (ACMs) in the sample. The level detected in all cases was below the hazardous level of 0.1% (as specified by Environment Agency (2018) Technical Guidance WM3).

As part of their assessment GII utilised HazWasteOnline™, a web-based commercial waste classification tool which assists the classification of potentially hazardous materials. This tool was used to determine whether the materials sampled are classified as hazardous or non-hazardous. The use of the online tool is accepted by the EPA (EPA 2014). In total, 15 no. samples were assessed using the HazWasteOnline™ tool. All samples were classified as being non-hazardous.

It should be noted that the environmental regulator (in this case the EPA) and the waste acceptor (in this case the landfill operator) shall decide whether a waste is hazardous or non-hazardous and suitable for disposal at their facility.

Landfill Waste Acceptance Criteria (WAC)

WAC have been agreed by the EU (Council Decision 2003/33/EC) and are only applicable to material if it is to be disposed of as a waste to a landfill facility. Each individual member state and landfill operator may apply more stringent WAC. The data obtained from laboratory testing has been compared to the WAC limits set out in the Council Decision as well as the specific WAC which the EPA had applied to Integrated Materials Solutions (IMS) landfill in north Co. Dublin. The IMS landfill has higher limits for a range of parameters while still operating under an inert landfill licence.

The waste category sections are divided in 4, lettered A-D, with numbered subcategories, A being suitable for disposal at an unlined soil recovery facility, B an inert landfill, C a non-hazardous landfill, and D a hazardous waste treatment facility.

The samples obtained from Trial Pits 01, 09, 10 & 13 fall into category A, Trial Pits 04, 05, 07, & 08 to Category B1 & Trial Pits 01, 02, 03, and 06 to Category C1. Note that some trial pits may fall into 2 categories depending on the level of the material being excavated and whether it is composed of in-fill material or the natural soil underneath.

Category A waste is briefly described as: Soil and stone only which are free from anthropogenic materials such as concrete, brick, timber etc. Soil must be free from contamination e.g., PAHs & hydrocarbons.

Category B1 waste: Reported concentrations within inert waste limits, which are set out by the adopted EU Council Decision 2003/33/EC establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 and Annex II of Directive 1999/31/ EC (2002). Results also found to be non-hazardous using the HWOL application.

Category C waste: Reported concentrations greater than Category B2 criteria but within non-hazardous landfill waste acceptance limits set out by the adopted EU Council Decision 2003/33/EC establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 and Annex II of Directive 1993/31/EC (2002). Note: Category C1 is as above but with asbestos fibres <0.001%.

It is estimated that the collective volume of historic in-fill material to be excavated and disposed of is 17,280m³, based on an area of 11,520m² and average depth of 1.5m.

6.4 Characteristics of the Proposed Development

The proposed development consists of 297 no. residential units, comprising of 211 no. houses, 46 no. duplex units and 40 no. apartments, 710 sqm creche, 242sqm café, 167sqm pharmacy and 172sqm yoga studio. The development includes all associated site works, boundary treatments, drainage, and service connections. The development will utilise the existing entrance from the Back Road that serves the Ashwood Hall development.

The proposed development, with respect to soils and geology, includes the following characteristics:

- Preparation of in-fill area for excavation (Japanese knotweed removal)
- Excavation and disposal of historic infill area to a suitably licenced landfill
- Stripping of topsoil
- Excavation for roads and building foundations
- Excavation for drainage sewers and utilities
- Minor regrading and landscaping
- Disposal of any surplus excavated soils including any contaminated materials

The proposed roads layout can be seen on drawing numbers 18-091-P3100, P3110 and P3111.

The proposed surface and foul drainage layouts can be seen on drawing numbers 18-091-P3200, P3210 and P3211, and the watermain layout on drawings P3300, P3310 and P3311

6.5 Potential Impacts

6.5.1 Construction Phase

The area of historic in-fill will need to be prepared for excavation. This will entail the removal of the Japanese Knotweed. The Japanese Knotweed if not treated and removed correctly may spread to other parts of the site or adjacent sites.

The removal of topsoil during earthworks and the construction of roads, services, and buildings, in particular roads and building foundations, will expose subsoil to weathering and may result in the erosion of soils during adverse weather conditions.

Construction traffic movements involved in the construction of the proposed development and access roads, may result in local compaction of the subsoil along haulage routes, but this will be a very limited area,

Surface water runoff from the surface of the excavated areas may result in silt discharges to the local ditch systems and the Hazelbrook Stream, which is a tributary of the Sluice River. Excavations for foundations, roadworks, and services will result in a surplus of subsoil. Surplus subsoil will be used in areas requiring fill where appropriate,

Dust from the site and from soil spillages on the existing road network around the site may be problematic, especially during dry conditions.

Accidental oil or diesel spillages from the construction plant and equipment, in particular at refuelling areas, may result in oil contamination of the soils and underlying geological structures.

6.5.2 Operational Phase

During the operational phase of the development, it is not envisaged that there will be any ongoing impacts on the underlying soil as a result of the proposed development. Any hydro-geological impacts are temporary and associated with the construction of the proposed development.

6.5.3 Potential Cumulative Impacts

On completion of the construction phase and following replacement of topsoil and a planting programme, no further impacts on the soil environment are envisaged except for the possibility of contamination of soil from foul water effluent or oil/chemical spills.

6.6 Remedial/Reductive or Mitigative Measure

A competent person/company will be assigned to pre-treat (kill-off) the Japanese Knotweed prior to excavation. It is generally recommended that a 3m depth of soil and an area encompassing a 7m offset distance are treated and excavated for disposal for this invasive species. The competent professional should also be present during excavation to ensure there are no living rhizomes (root structures) present when being excavated. The dead Japanese knotweed plant, root system and surrounding soil will need to be disposed of, by prior arrangement, to an authorised deep-fill landfill. These works are to be undertaken in accordance with the “Environmental Agency guidelines on Japanese Knotweed”, Landfill operator permitting, and industry best practices & guidelines as appropriate.

Environmental Laboratory chemical analysis has indicated that the historic in-fill constituents are non-hazardous. Excavated material from this location should be continuously monitored/inspected for signs of hazardous material contamination during excavation. Should there be any indication of hazardous material contamination, it may be required to be further sampled and analysed to confirm its chemical properties and waste category classification.

To reduce the quantity of soil to be removed from or imported to the site, the finished floor levels of the proposed buildings and the road levels are designed to match existing levels and minimise the cut and fill volumetric balance. The number of vehicle movements will be minimised by this optimisation. For the area of historic in-fill, levels here have been designed based on the calculated ground levels post excavation and disposal of the historic in-fill material. Surplus subsoil and rock may be relocated to approved areas of the site that may require in-fill, or if required to be removed from site, will be deposited in approved fill areas off-site (Article 27 notification to the EPA required) or to an approved waste disposal facility.

In the case of topsoil careful planning and on-site storage can ensure that this resource is reused on-site as much as possible. Any surplus soil not used can be transferred elsewhere subject to submission of an Article 27 notification to the EPA. However, topsoil is quite sensitive and can be rendered useless if not stored and cared for properly. It is therefore important that topsoil is kept completely separate from all other construction waste and stored material and heaped (stored) appropriately.

It is important to ensure that topsoil is protected from all kinds of vehicle damage and kept away from site-tracks, delivery vehicle turning areas and site plant and vehicle storage areas. If topsoil is stored in piles of greater than 2m in height the soil matrix (internal structure) can be damaged beyond repair. It should also be kept as dry as possible and used as soon as possible to reduce any deterioration through lengthy storage and excess movements around the site.

Records of topsoil storage, movements and transfers will be kept by the C&D Waste Manager.

Silt traps, silt fences and tailing ponds will also need to be provided by the contractor where necessary to prevent silts and soils being washed away by heavy rains during the course of the construction phase.

The provision of wheel wash areas at the exit to the development as necessary will minimise the amount of soil deposited on the surrounding road network. The adjoining road network will be cleaned on a regular basis. All trucks on the public road will carry a maximum of 10 cubic metres of material to prevent spillage and damage to the surrounding road network.

Dampening down measures with water sprays will be implemented during periods of dry weather to reduce dust levels arising from the development works.

Appropriate storage and bunding measures will be implemented throughout the construction stage to prevent contamination of the soil and groundwater from oil and petrol leakage from site plant. Refuelling will be restricted to allocated re-fuelling areas. This is to be an impermeable bunded area, designed to contain 110% of the volume of fuel stored. Emergency fuel spill kits are to be stored on-site with designated staff familiar with their usage.

If groundwater is encountered during excavations, mechanical pumps will be required to remove that groundwater from sumps. Sumps should be carefully located and constructed to ensure that groundwater is efficiently removed from excavations and trenches.

Waterman Moylan's accompanying Preliminary Construction Demolition and Waste Management Plan will be implemented by the contractor during the construction phase to mitigate and control the above remedial measures.

6.6.2 Operational Phase

On completion of the construction phase and following replacement of topsoil, a planting programme will commence to prevent soil erosion.

SuDS and filtration devices are proposed to be provided as part of the development. These will help to remove pollutants from rainwater runoff. They will require periodic inspection and maintenance as per their installation manuals.

6.7 Predicted Impact of the Proposal

6.7.1 Construction Phase

With the protective measures noted above in place during the excavation works, any potential impacts on soils and geology in the area will not have significant adverse impacts, and no significant adverse impacts on the soils and geology of the subject lands are envisaged.

6.7.2 Operational Phase

On completion of the construction phase and following replacement of topsoil and implementation of a planting programme, no further impacts on the soil are envisaged.

SuDS measures, including permeable paving and infiltration drains, will assist with cleaning surface water runoff while replenishing the natural ground water table.

6.8 Monitoring

Monitoring during the construction phase is recommended, in particular to the following items:

- Excavation of area of Japanese Knotweed.
- Excavation of the historic in-fill material.
- Adequate protection of topsoil stockpiled for reuse.
- Adequate protection from contamination of soils for removal.
- Monitoring of surface water discharging to existing watercourses, ditches, and the existing surface water drainage system.
- Monitoring cleanliness of the adjoining road network.
- Monitoring measures for prevention of oil and petrol spillages.
- Dust control by dampening down measures, when required due to dry weather conditions.

During the operation phase, the surface water network (drains, gullies, manholes. AJs, SuDS Devices, attenuation systems etc.) will need to be regularly maintained and where required cleaned out. A suitable maintenance regime of inspecting and cleaning should be incorporated into the safety file/maintenance manual for the development.

6.9 Do Nothing Scenario

The ground conditions will remain as they currently are.

6.10 Risks to Human Health

A potential risk to human health due to the associated works during construction is the direct contact, ingestion, or inhalation of receptors (i.e., construction workers) with any soils which may potentially contain low level hydrocarbon concentrations from site activities (potential minor leaks, oils, and paint).

No human health risks associated with long term exposure to contaminants (via direct contact, ingestion, or inhalation) resulting from the proposed development are anticipated.

6.11 Reinstatement

Reinstatement measures in relation to soils consist primarily of the re-soiling of open areas / landscaping and the replanting of these areas. No post development reinstatement works will be required.

6.12 Interactions

No significant interactions are anticipated.

6.13 Difficulties Encountered

There were no difficulties encountered.

6.14 References

Geological Survey of Ireland, Bedrock Maps (https://www.gsi.ie/en-ie/data-and-maps/Pages/default.aspx).

Ground Investigations Ireland, Back Road Malahide, Cladwell Estates, Waste Classification Report April 2020.

Site Investigations Ltd., Site Investigation Reports, Broomfield – North Site, Back Road, Malahide, Co. Dublin, 2021.

Ordnance Survey Maps, (https://osi.maps.arcgis.com/apps/mapviewer/index.html).

Google Earth Pro.

7.0 WATER

7.1 Introduction

This section of the Environmental Impact Assessment Report (EIAR) has been prepared by Waterman Moylan and provides an assessment of the impact that the proposed Large-scale Residential Development (LRD) of the Northern lands at Broomfield, Malahide, Co. Dublin, will have on the surrounding hydrological (surface water), hydrogeological (ground water), foul water, water supply and flood risk both during the construction and operation phases. The interaction between the surface water drainage proposal as part of the development will also be assessed in this chapter.

7.2 Study Methodology

The methodology followed for this section is in accordance with the EPA's "Environmental Impact Assessments Reports, Draft Guidelines 2022".

The following information sources were used in the assessment of the local hydrology and hydrogeological aspects of the proposed development site:

- Geological Survey of Ireland (GSI) Website
- Environmental Protection Agency
- Office of Public Works (OPW) National Flood Hazard Mapping
- OPW Catchment Flood Risk and Management Studies
- Fingal County Council Drainage Records Maps
- Ordinance Survey Mapping
- Topographical Survey
- Site Investigation Reports and Soakaway Testing
- Strategic Flood Risk Assessment for the Fingal Development Plan 2023-2029

The following methodology has been adopted for this assessment:

- Review of relevant information including where available, Development Plans, existing drainage, watermain and flooding information, and other relevant studies as outlines above; and
- Consultations with Fingal County Council to agree the foul drainage strategy.
- Irish Water Code of Practices.
- Irish Water confirmation of feasibility letter.
- Irish Water Statement of Design Acceptance.

7.3 Receiving Environment

7.3.1 Site Location and Topography

The subject lands are located at Broomfield, Malahide, Co. Dublin. The site is bound to the west by Ashwood Hall Residential development, to the east by the Dublin-Belfast Rail line, the north by existing residential units fronting onto the Back Road, and to the south by agricultural land.

The site will primarily be accessed via the existing junction to Back Road serving the Ashwood Hall residential development. Secondary access will be provided via the Hazelbrook residential development to connect to Kinsealy Lane.

A topographic survey of the area indicated that the site generally slopes uniformly from north-east to south, from a height of 20.500m to 11.500m OD Malin, with an existing dry ditch system along the south-east boundary, and ditch to the south-west.

The existing dry ditch on the southern boundary of the north site serves the subject site only due to topography, water flowing to this ditch is percolated locally and there is no connection to any watercourse. The drainage ditch to the south-west eventually connects to the Hazelbrook stream. Hazelbrook stream is a tributary of the Sluice River with an ultimate outfall to Baldoyle Bay.

The location of the subject site is as indicated in Figure 7.1 below:

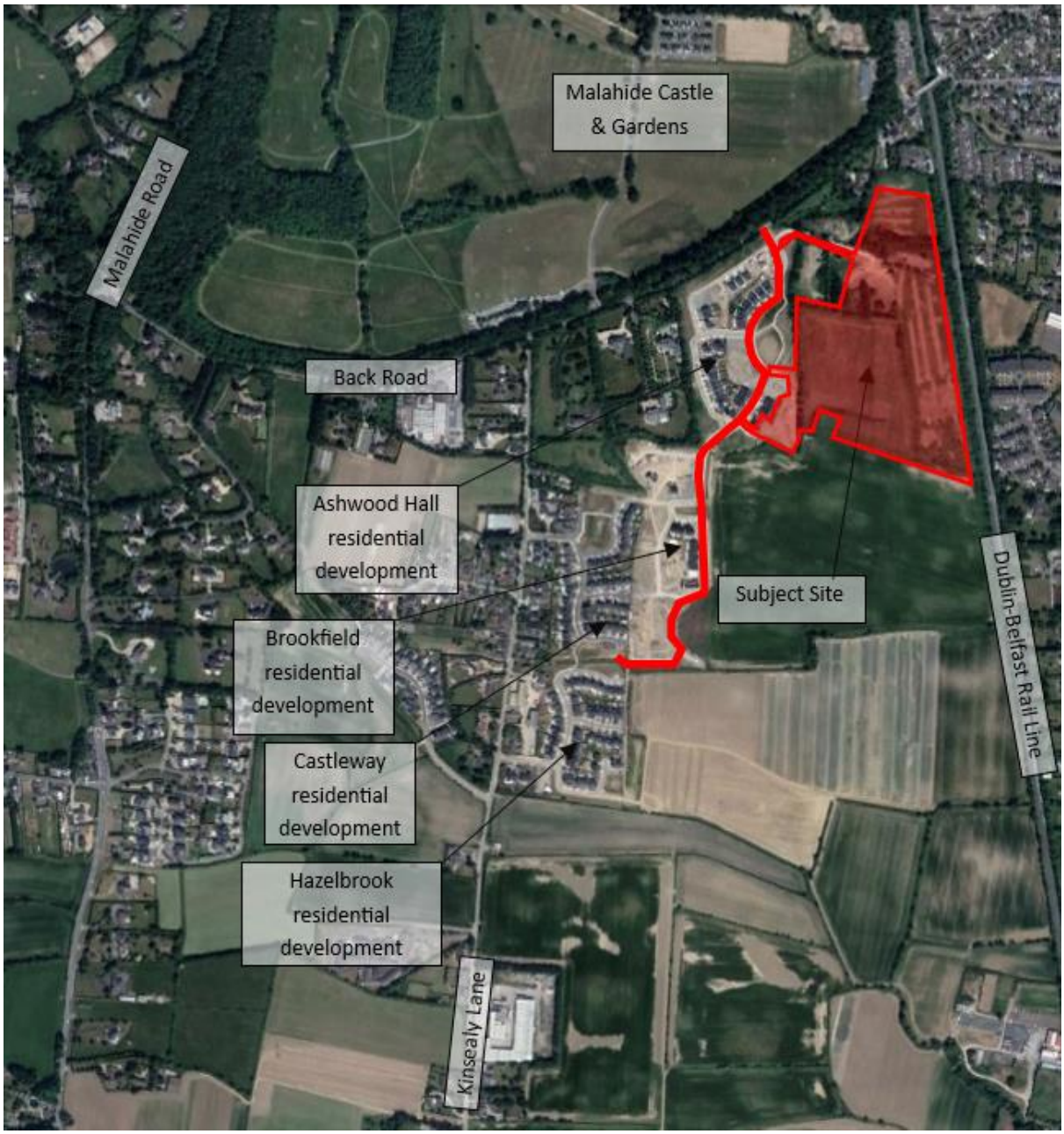


Figure 7.1 | Site Location (Source: Google Earth)

7.3.2 Desktop Study

Historic maps for the locality have been reviewed, with majority of the subject site has no sign of development and have been historically used for agriculture. A section to the north of the subject site has been used previously as a rugby club and comprises an area of hardstanding and club house structures. These structures have been heavily vandalised in the form of fire damage and their demolition comprises part of the subject application.

7.3.3 Hydrology (Surface Water)

Surface water from the site discharges into a series of boundary ditches on the perimeter of the site. Part of the site's drainage ditch network on the southern boundary is a static/dry ditch which falls towards the railway line which has a culvert connecting to a ditch on the east of the railway line. There is also a north-south ditch running along the west of the site which flows south westwards under a 1.5m x 2.1m box culvert under Kinsealy Lane via 1050mm diameter and then a 450mm diameter culvert under Kinsealy Lane before connecting to the Hazelbrook Stream and ultimately the Sluice River.

The Sluice River outfalls to Baldoyle Bay which has been designated as an SPA (Special Protection Area) by the NPWS (National Park and Wildlife Service) and Local authority, under the RAMSAR Convention. It was declared a Statutory Nature Reserve in 1988 and supports several habitats as listed in the EU Habitats Directive.

7.3.4 Hydrogeology (Groundwater)

A review of the EPA's (Environmental Protection Agency) website database classifies the ground waterbody (2016-2021) status as good, as per the extract shown in Figure 7.2 below.

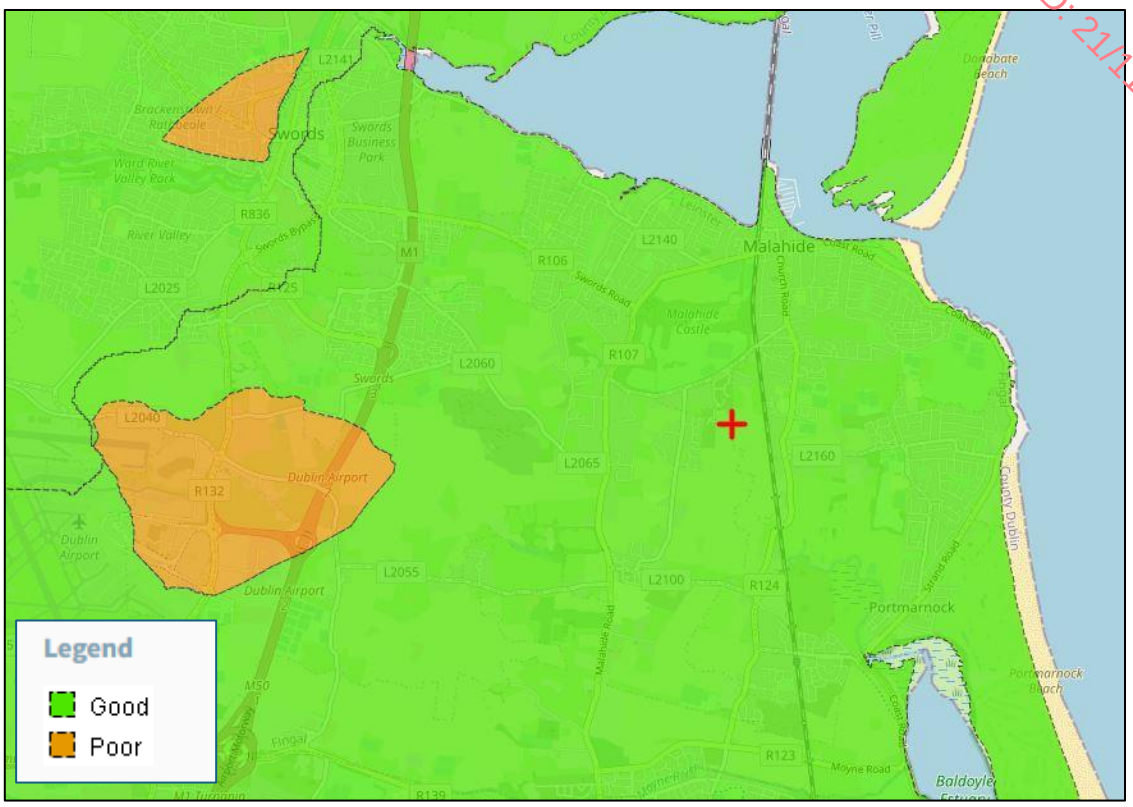


Figure 7.2 | EPA's Ground Waterbody Status

GSI's aquifer classes are divided into three main groups based on their resource potential, and further sub-divided based on the type of openings through which groundwater flows. A review of the GSI databased revealed that the aquifer below the subject lands is classified as PI, Poor Aquifer – Bedrock which is generally unproductive except for Local Zones.

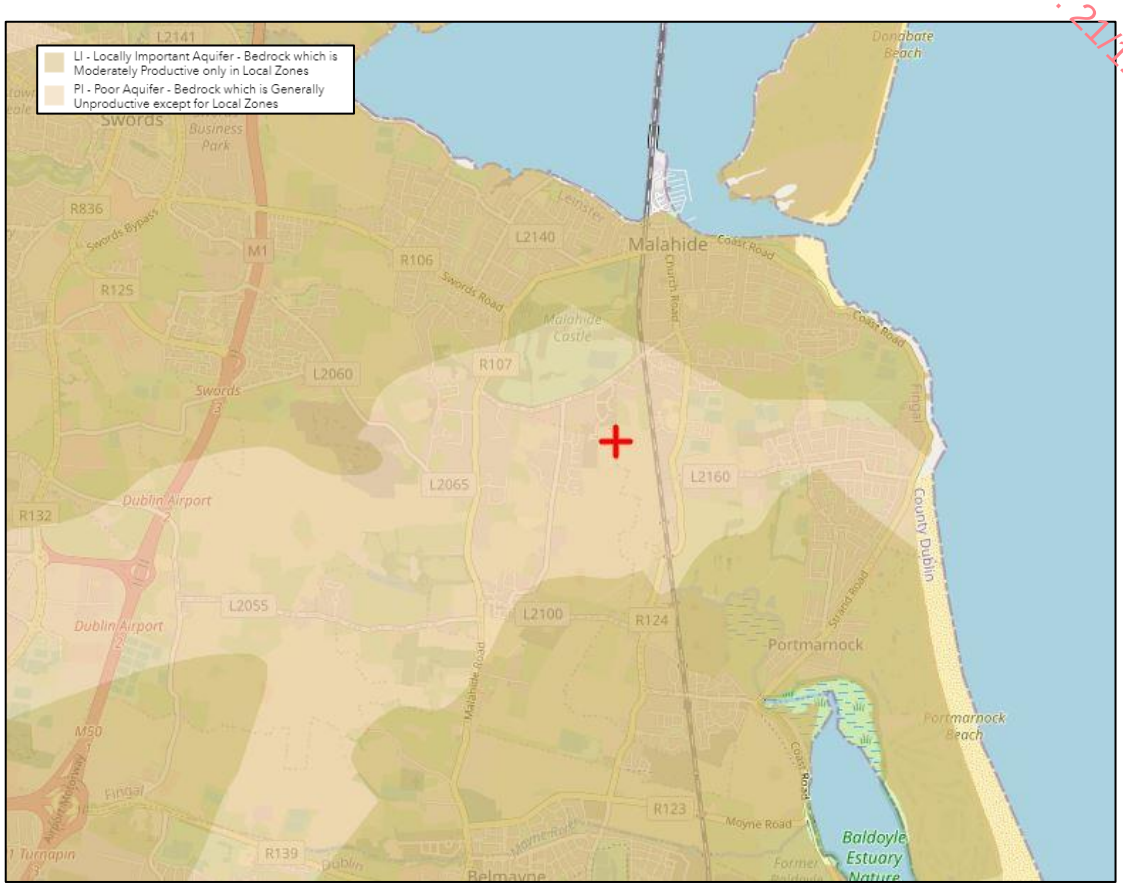


Figure 7.3 | GSI Aquifer

7.3.5 Flood Risk Assessment

A Flood Risk Assessment has been prepared by Waterman Moylan Engineers and has been submitted under a separate cover. This Flood Risk Assessments has been carried out in accordance with the DEHLG/OPW Guidelines on the Planning System and Flood Risk Management Guidelines for Planning Authorities published in November 2009. The subject site has been analysed for risks from tidal flooding from the Irish Sea and the surrounding tributary surface water ditch system of Hazelbrook stream, fluvial flooding from the existing ditch system & Hazelbrook Stream, pluvial flooding, ground water and failures of mechanical systems.

The subject site is located within the Sluice River catchment. The ditch systems on the site boundaries outfall to Hazelbrook Stream, tributary of the Sluice River. The dich system on the subject site have small flow (small catchments) or are static ditches and do not carry flows from ditch system outside of the site itself.
According to the Fingal Development Plan 2023-2029-Strategic Flood Risk Assessment, Map M02127-06_FIG_FL316, the subject site is located within Flood Zone C. Development within Flood Zone C is appropriate from a flood risk perspective.

As defined in the Planning System and Flood Risk Management Guidelines for Planning Authorities 2009: Zone C - has low probability of flooding. Development in this zone is appropriate from a flood risk perspective (subject to assessment of flood hazard from sources other than rivers and the coast) but would need to meet the normal range of other proper planning and sustainable development considerations.

Figure 7.4 overleaf, is an extract from the Fingal Development Plan 2023-2029 - Strategic Flood Risk Assessment, High End Future Scenario Climate Change Flood Extents Map M02127-06_FIG_FL316 The map shows that the subject site is outside of the 0.1% annual Exceedance Probability (AEP) flood plain.

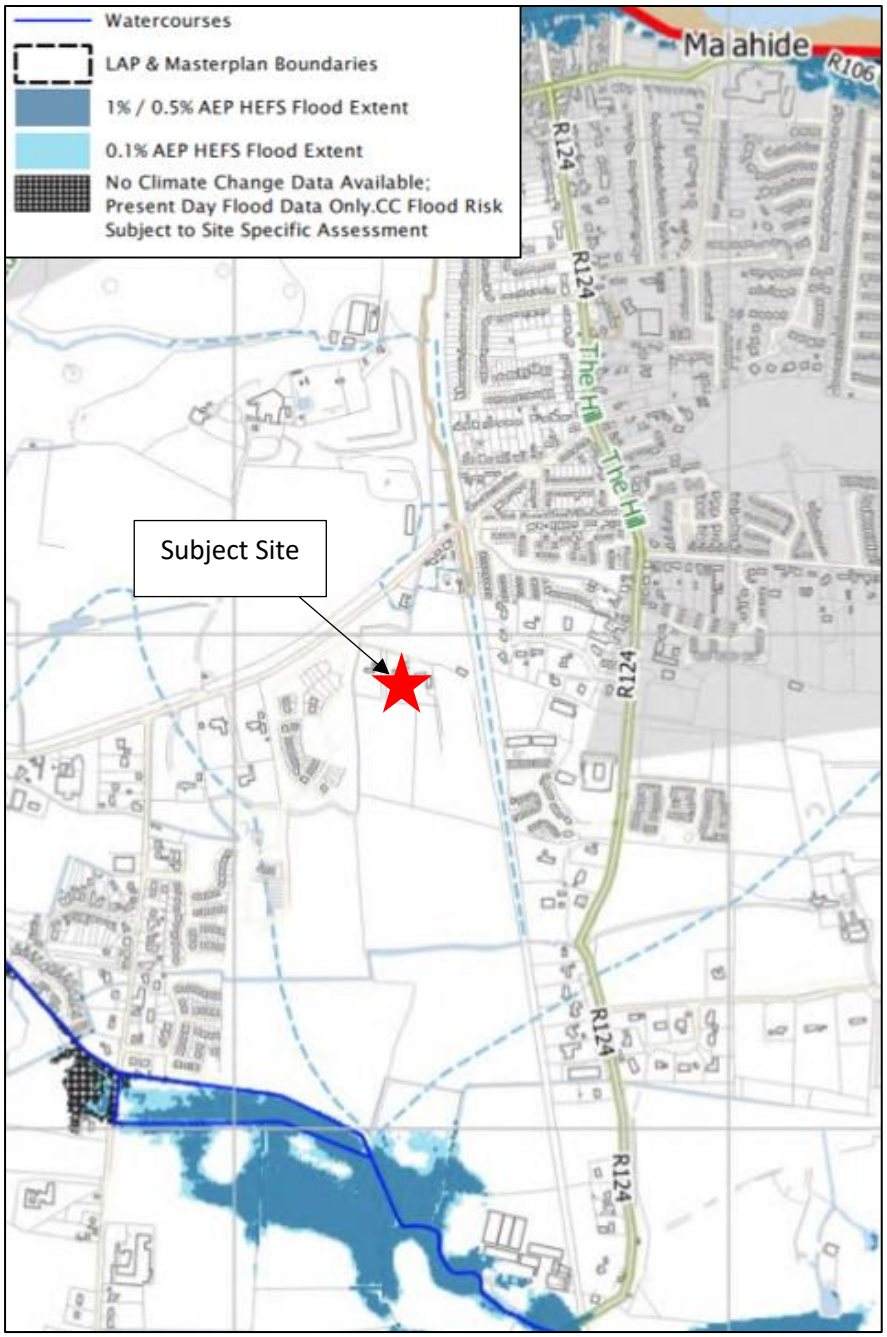


Figure 7.4 | Flood Extent Map Excerpt from the Fingal Development Plan 2023-2029 - Strategic Flood Risk Assessment, High End Future Scenario Climate Change Flood Extents Map M02127-06_FIG_FL316

A summary of flood risks can be seen in Table 7.1, below.

Source	Pathway	Receptor	Likelihood	Consequence	Risk	Mitigation Measure	Residual Risk
Tidal	*Irish Sea (Malahide Estuary)*	*Proposed development*	*Extremely low*	*None*	*Negligible*	*None*	Negligible
Fluvial	*Hazelbrook Stream (tributary of the Sluice River)*	*Proposed development*	*Low*	*Low*	*Extremely Low*	*Setting of floor levels, overland flood routing*	Extremely Low
Pluvial	*Private & Public Drainage Network*	*Proposed development, downstream properties, and roads*	*Ranges from high to low*	*Moderate*	*Ranges from high to low*	*Appropriate drainage, SuDS, and attenuation design, setting of floor levels, overland flood routing*	Low
Ground Water	*Ground*	*Underground services, ground level of buildings, roads*	*Moderate*	*Moderate*	*Moderate*	*Appropriate setting of floor levels, flood routing, damp proof membranes*	Low
Human/ Mechanical Error	*Drainage network*	*Proposed development*	*High*	*Moderate*	*High*	*Setting of floor levels, overland flood routing, regular inspection of SW network*	Low

Table 7.1 | Summary of the Flood Risks from the Various Components

7.3.6 AA Screening

Indirect impacts from the foul and surface flows are discussed in the AA screening commentary and are addressed in the Biodiversity Chapter of this EIAR.

7.3.7 Water Supply

A pre-connection enquiry was submitted to Irish Water, the subsequent confirmation of feasibility letter from Irish Water, advises that local upgrades to the public network is required.

There are a number of existing interconnected water supply mains in the vicinity of the subject site, including:

- A 150mm diameter water supply network serving Ashwood Hall residential development, to the west of the north subject site, is connected to the 300mm diameter public networks on both Kinsealy Lane & Back Road. 3 no. 100mm diameter spurs have been constructed on Ashwood Hall in anticipation of connections required by the proposed development.

7.3.8 Foul Water Network

The site is generally greenfield with no existing foul sewer networks.

Similar to the existing watermain network, there are a number of interconnected networks adjacent to the subject site, that have been designed in anticipation of future connections from the proposed development.

- Ashwood Hall Residential Development has 2 no. 225mm diameter spurs constructed to provide future connections for the north site. The Ashwood Hall foul network is comprised of a 225mm diameter network, which flows south, to connect to the Brookfield Residential Development 225mm diameter network. The Brookfield network flows south and then westerly to connect to the Castleway Residential Development 225mm diameter network. The Castleway network flows south to connect to the Hazelwood Residential Development 225mm diameter network.

The foul flows from the above-mentioned Residential developments currently flow to the public foul sewer in Kinsealy Lane, which outfalls to Connolly Avenue pumping station. Connolly Avenue pumping station pumps flows from these developments, and other areas, to Malahide Wastewater Treatment Plant.

During the pre-planning process in respect of this Broomfield LRD application, Uisce Eireann discussed the possibility of a new 'Castleway' pumping station on Kinsealy Lane, which would alleviate current constructs in Connolly Avenue pumping station. Uisce Eireann have confirmed that this pumping station is due to be commissioned in Q1 2029.

Uisce Eireann confirmed that a temporary pumping station can be constructed on site as an interim solution.

A pre-connection enquiry for the proposed development has been submitted to Irish Water on 2 February 2024. The confirmation of feasibility letter has been received and is part of this submission.

7.4 Characteristics of the Proposed Development

The proposed development consists of 297 no. residential units, comprising of 211 no. houses, 46 no. duplex units and 40 no. apartments, 710 sqm creche, 242sqm café, 167sqm pharmacy and 172sqm yoga studio. The development includes all associated site works, boundary treatments, drainage, and service connections. The development will utilise the existing entrance from the Back Road that serves the Ashwood Hall development.

7.4.1 Proposed Water Supply

It is proposed to upsize the existing 100mm Ø watermain spur to 200mm Ø watermain to connect the proposed development to 300mm Ø watermain at Back Road. It is also proposed to provide another 2 no. connections to the adjacent Ashwood Hall residential development to the west.
The proposed network consists of a 150mm Ø watermain running along the Main Access Roads, with a series of 100mm Ø branches and loops.

As discussed above, the spurs in the adjacent Ashwood Hall development have been designed and located in anticipation of these connections from the proposed development. Letters of consent have been obtained from the adjacent development owners permitting these proposed connections. The proposed internal watermain layout, and the existing networks in the adjacent estates can be seen on Waterman Moylan Drawing numbers 18-091-P3300, P3310 and P3311 Watermain Layout.

A pre-connection enquiry for the proposed development has been submitted to Uisce Eireann on 2 February 2024. The Confirmation of Feasibility (CoF) letter, with reference number CDS24001114, was received on 23 April 2024. The COF confirms the development's water demand can be accommodated without any infrastructure upgrades.

An estimate of the water demand from the public water supply system for the subject development is shown in Table 7.2 below. The average domestic demand has been established based on an average occupancy ratio of 2.7 persons per dwelling with a daily domestic per capita consumption of 150 litres and with a 10% allowance factor. The average day/peak week demand has been taken as 1.25 times the average daily domestic demand, while the peak demand has been taken as 5 times the average day/peak week demand, as per Section 3.7.2 of the Irish Water Code of Practice for Water Infrastructure 2020.

Population estimate for creche has been based on Regulation for Pre-school Childcare Services, maximum occupancy of 22 children per room. Population for Café and Yoga Studio has been based on the occupancy capacity used in TGD B 2024, Table 2 Occupancy Load Factor (OLF) which is used to calculate Occupant Capacity defined as: *'Occupant capacity of a room or storey is the maximum number of persons it is designed to hold'*. For cafe (*place of assembly used for the sale to members of the public of food or drink for consumption on the premises*) the OLF is 1.0 / sqm and for yoga studio (*gymnasium*) the OLF is 5.0 / sqm. OLFs has been applied to gross areas which will result in overestimation. Pharmacy population estimate assumes 2no. staff members.

Commercial aspect water demand is estimated as per section Appendix C of the Irish Water Code of Practice for Wastewater Infrastructure.

Description	Total Population	Water Demand	Average Demand	Average Peak Demand	Peak Demand
	No. People	*l/day*	*l/day*	*l/s*	*l/s*
Domestic					
Domestic					
205 Houses	554	150	83,100	1.20	6.01
58 Duplexes	157	150	23,550	0.34	1.70
40 Apartments	108	150	16,200	0.23	0.17
Commercial					

Creche 710sqm (7 classrooms)	154	90	13,860	0.20	1.00
Café 242sqm	242	30	7,260	0.11	0.53
Pharmacy 167sqm	2	30	60	0.001	0.004
Yoga Studio 172sqm	34	50	1,700	0.02	0.12
Total	**1,251**	**Varies**	**145,730**	**2.11**	**10.54**

Table 7.2 | Calculation of Total Water Demand for the Development

Based on these figures, the average peak demand for the development is 2.11l/s, with a peak demand of 10.54l/s.

The Confirmation of Feasibility (CoF) letter, with reference number CDS24001114, was received on 23 April 2024. The COF confirms the development's water demand can be accommodated without any infrastructure upgrades.

The Confirmation of Feasibility Letter is included as Appendix to the Engineering Assessment Report, which accompanies this submission under separate cover.

7.4.2 Proposed Foul Network

It is proposed to drain wastewater from the proposed development in a south-westerly direction by gravity through a series of 150mm, 225mm diameter pipe sewer network to the existing sewer network in the Ashwood Hall. The existing foul networks in the adjacent residential developments, have been appropriately designed and constructed, including spurs for connection points, to accommodate the future connection of the proposed development. A temporary foul water pumping station with 24 hour storage is proposed on site until the proposed Uisce Eireann Castleway pumping station is commissioned in Q1 2029.

The proposed internal foul drainage network has been designed and sized in accordance with the Irish Water code of Practice for Wastewater Infrastructure and Standard Details. Please refer to Waterman Moylan drawing numbers 18-091-P3200, P3210 and P3211 which show the proposed foul drainage layout, and existing foul water networks in adjacent Ashwood Hall estates.

The Uisce Eireann CoF letter CDS24001114, dated 23 April 2024, confirmed that the proposed development is feasible subject to upgrades.

As advised by Uisce Eireann: *'in order to accommodate the proposed connection at the Premises, upgrade works are required to increase the capacity of Connolly Avenue Pumping Station. Uisce Eireann currently has a project underway which will provide the necessary upgrade and capacity. This upgrade project is scheduled to be completed by Q1 2029 (this may be subject to change) and the*

proposed connection could be completed as soon as possibly practicable after this date. In the Interim the development may be accommodated by:

- *Providing a Temporary Pumping Station with 24Hr Storage in the development*
- *Full Telemetry system to be provided to link to the Castleway Overflow Tank/Connolly Avenue Pumping Station so flows are stored and pumped forward when Castleway Overflow recedes*
- *A bypass to be provided to allow decommission of Interim Pumping Station on completion of the project The developer is responsible for the maintenance and operation of the Temporary Pumping Station,*
- *The Temporary Pumping Station is to be fully decommissioned by the developer on completion of the Capital Investment Project. The developer is advised to engage with Uisce Eireann early at connection application stage.'*

It is proposed to comply with the above Uisce Eireann requirements. For details of the proposed Temporary Pumping Station, please refer to Waterman Moylan drawing 18-091-P3215 Interim Drainage Layout for Foul Water Pumping Station and Attenuation.

An estimate of the foul water discharge rate from the subject development to the public drainage network is shown in Table 7.3 overleaf. Domestic wastewater loads have been calculated based on 2.7 persons per unit with a per capita domestic wastewater flow of 150 litres per capita per day along with infiltration rate of 10% unit consumption. A peak flow multiplier of 4.5 has been used. Commercial wastewater flow rates have been based on Appendix C, all in line with Section 2.2 of the Irish Water Code of Practice for Wastewater Infrastructure 2020.

Population estimate for creche has been based on Regulation for Pre-school Childcare Services, maximum occupancy of 22 children per room. Population for Café and Yoga Studio has been based on the occupancy capacity used in TGD B 2024, Table 2 Occupancy Load Factor (OLF) which is used to calculate Occupant Capacity defined as: *'Occupant capacity of a room or storey is the maximum number of persons it is designed to hold'*. For cafe (*place of assembly used for the sale to members of the public of food or drink for consumption on the premises*) the OLF is 1.0 / sqm applied to gross area which will result in overestimation. For yoga studio (gymnasium) the OLF is 5.0 / sqm. Pharmacy population estimate assumes 2no. staff members.

Commercial aspect wastewater flow rates are estimated as per section Appendix C of the Irish Water Code of Practice for Wastewater Infrastructure.

Description	Total Population	Load per Capita	Daily Load	Total DWF	Peak Flow
	No. People / sqm	*l/day*	*l/day*	*l/s*	*l/s*
Domestic					
Domestic					
211 Houses	570	150	94,050	1.09	4.91

46 Duplexes	125	150	20,625	0.24	1.08
40 Apartments	108	150	17,820	0.21	0.95
Commercial					
Creche 710sqm (7 classrooms)	154	90	15,246	0.18	0.79
Café 242sqm	242	30	7,986	0.09	0.42
Pharmacy 167sqm	2	30	66	0.001	0.003
Yoga Studio 172sqm	34	50	1,870	0.02	0.10
Total	**1,235**	**Varies**	**157,663**	**1.831**	**8.253**

Table 7.3 | Calculation of Total Foul Water Flow from the Development

The total dry weather flow from the development is 1.831 l/s, with a peak flow of 8.253l/s.

7.4.3 Proposed Surface Water Network

It is proposed to construct a surface water drainage network that will service and attenuate the development internally before discharging at the current greenfield rates to the local natural ditch systems.

It is proposed to drain surface water from the proposed development via a series of sewers ranging from 150mm to 600mm diameter to outfall to the existing drainage ditches to the south. The proposed development has been subdivided into 5 no. separate catchments, each with their own attenuation basin and hydrobreak, cascading to 2no. outfall headwalls.

The surface water will be eventually discharged at greenfield rates via 2no. headwalls to the existing ditch running along the site southern boundary. Class A petrol interceptors will be installed immediately prior to the final surface water discharge.

A twin 600mm diameter culvert will be constructed to convey the existing south-western ditch flows under the proposed Road 7.

Surface water drainage layout and attenuation strategy can be reviewed on drawing numbers 18-091-P3200, P3210 and P3211.

The proposed development incorporates a Storm Water Management Plan through the use of various SuDS techniques. Treatment and storage of surface water at source will intercept and slow down the rate of runoff from the site to the existing surface water sewer system.

Based on three key elements, Water Quantity, Water Quality and Amenity, the targets of the SuDS train concept have been implemented in the design. The SuDS devices proposed around the site include permeable paving, filter drains, sedum roofing, bio-retention systems, swales, dry detention basins, flow control devices and petrol interceptors.

Attenuation storage is provided to limit the discharge rate from the site into the public network. As per the GDSDS, the required attenuation volume is calculated assuming 80% runoff from paved areas, and has been calculated for the 1-year, 30-year and 100-year return periods, identifying the critical storm for each.

All catchments will be attenuated in detention basins, only attenuation tank is proposed for apartment Block A. The tank proposed to serve the apartment Block A will remain under private management.

Surface water runoff will be restricted via a hydro-brake or similar approved flow control device, limited to the greenfield equivalent runoff rate for each catchment.

The proposed SuDS are shown on the drainage layout drawings, 18-091-P3230, P3231 and P3270.

7.4.4 Potential Impact of the proposed Development

Construction Phase:

Significant amounts of site stripping and excavation will be required in order to construct the development. When the site has been stripped layers of sub-soil will be exposed to weathering and there will be potential for erosion due to rainfall and subsequent runoff. The erosion of soil can lead to sediments being washed into the receiving watercourses/sewers at higher rates of runoff.

There is also potential during the development's construction stage that contaminants from cement/concrete be washed into the receiving watercourses / sewers.

There is a risk of pollution of groundwater/watercourses/soils by accidental spillage of oils/diesel from temporary storage areas or where construction equipment is maintained.

Foul water could be connected to the surface water drainage network resulting in the contamination of the receiving watercourses. Furthermore, if there is damage to any foul pipes, there is potential for contaminants to seep into the groundwater.

The construction of the proposed development has potential to cause a slight, adverse, temporary, residual impact on receiving watercourses/groundwater.

There may be temporary interruptions to the local water supply during the upgrading works to the public network. Local residents that may be affected will be notified in advance of the works taking place.

There will be some minor water demand for site offices. There is a risk of contamination to the existing water supply during connection of the development's watermains to the public water supply.

Operational Phase:

The proposed development will result in increased impermeable areas and there is potential for an increase in risk of higher rates of surface water runoff leading to increased downstream flooding.

There is a potential impact for the discharge of contaminants from the proposed development and road surfaces to the surrounding drainage sewers. These would include particulates, oil, soluble extracts from the bitumen binder etc. The quality of runoff from the site would be dependent on the time of year, weather, particulate deposition from the atmosphere and any gritting or salting carried out by the Local Authority. The time of year has a major bearing on the quality of storm water run-off - in particular the first rains after a prolonged dry period where accumulated deposits of rubber, particulates, oils, etc. are, washed away.

There is potential for leaks in the foul network to result in contamination of the groundwater.

Accidental spills of fuels/hydrocarbons and washing down into the drainage pipe network has the potential to impact on the receiving hydrogeology.
The operation of the proposed development has the potential to cause a slight, adverse, temporary, residual impact on receiving watercourses/groundwater.
There is a potential for Watermain leaks which would increase the volume of water permeating through the underground soil strata.
During the operational phase of the development, there will be an increase in demand for water from the public water supply.

7.5 Potential Cumulative Impacts

There are no anticipated cumulative impacts arising from the proposed development, or any further development in the locality in relation to water, other than those noted above.

7.6 Do Nothing Scenario

In this scenario, surface water runoff would continue to be discharged at existing un-restricted discharge rates. The receiving watercourses and groundwater aquifers would remain in their current state and there would be no change.

7.7 Risks to Human Health

There is a risk to Human Health should the ground water or the existing water supply become contaminated during the construction or operational stages, and the water is consumed. In order to mitigate these risks, the measures outlined below will be adopted.

7.8 Mitigation Measures

This section of the report will discuss mitigation measures to reduce the impact of the proposed development on the surrounding water environments during the construction and operation phase.

Construction Phase:

A Preliminary Construction Management Plan (PCMP) has been prepared for this application and is included under a separate cover. It is considered that the PCMP will be updated by the appointed contractor. In order to minimise the potential impact of the construction phase of the proposed development on the surrounding surface water and groundwater environs, the following construction stage mitigation measures are to be included in the plan and be implemented in full.

- The contractor will appoint a suitably qualified person to oversee the implementation of measures for the prevention of pollution to the receiving surface water environment.
- To minimise the adverse effects, the prevailing weather conditions and time of year is to be taken into account when the site development manager is planning the stripping back of the site.

- Site stripping will be minimised as far as practicable.
- Settlement ponds/silt traps will be provided to prevent silt runoff into the existing sewers/watercourses during the drainage works.
- Regular testing of surface water discharges will be undertaken at the outfall from the subject lands. The location for testing and trigger levels for halting works will be agreed between the project ecologist and the site foreman at the commencement of works.
- Where silt control measures are noted to be failing or not working adequately, works will cease in the relevant area. The project ecologist will review and agree alternative pollution control measures, such as deepening or redirecting trenches as appropriate, before works may recommence.
- All fuels and chemicals will be bunded, and where applicable, stored within double skinned tanks/containers with the capacity to hold 110% of the volume of chemicals and fuels contents. Bunds will be located on flat ground a suitable distance from any watercourse or other water conducting features, including the cut off trenches.
- Foul and surface water pipes will be carefully laid so as to minimise the potential for cross connections which may result in contamination of receiving watercourses.
- Site personnel inductions are to be conducted such that all site personnel are made aware of the procedures the best practice in relation to the management of surface water runoff and ground water protection.
- Where possible, precast concrete units are to be used to avoid on-site “wet” mix concrete usage. In-situ concrete pours are to be managed in accordance with best practice to avoid overspills
- Concrete truck and wheel wash down facilities are to be provided in designated areas. Discharge from these areas is to be directed into the settlement ponds/silt traps.
- Topsoil for landscaping will be located in such a manner as to reduce the risk of washing away into local drainage or watercourses.
- A method statement setting out in detail the procedure to be used when working in the vicinity of existing watermains will be produced by the contractor for any construction works within the vicinity of watermains and for roads and or services crossing watermains.
- All watermains will be cleaned and tested in accordance with Irish Water guidelines prior to connection to the public watermain.
- All connections to the public watermain will be carried out and tested by or under the supervision of Irish Water or the design engineer.
- Details for the construction methods of the outfall head walls to mitigate against pollution of the natural surface water networks are set out in the Preliminary Construction Demolition & Waste Management Plan.

In order to reduce the risk of defective or leaking foul sewers, the following measures will be implemented:

- All new foul sewers will be tested by means of an approved air test during the construction phase in accordance with Irish Waters Code of Practice and Standard Details.
- All private drainage will be inspected and signed off by the design Engineer in accordance with the Building Regulations Part H and BCAR requirements.
- Foul sewers will be surveyed by CCTV to identify possible physical defects.

- The connection of the new foul sewers to the public sewer will be carried out under the supervision of Irish Water and will be checked prior to commissioning.
- Prior to commencement of excavations in public areas, all utilities and public services will be identified and checked, to ensure that adequate protection measures are implemented during the construction phase.

Potential negative impacts during construction phase will be short term only.

Operational Phase:

The implementation of the following operation stage mitigation measures will minimise the impact on the hydrology and hydrogeology aspects of the development lands.

- The surface water drainage network has been designed in accordance with the CIRIA SUDS Manual and the Greater Dublin Strategic Drainage Scheme. The appropriate interception mechanisms and treatment train process has been incorporated into the design.
- Surface water outflow will be restricted to the equivalent greenfield runoff rate from the proposed attenuation tanks.
- Flow restrictors with attenuation storage will be used to slowdown and store surface water runoff from discharging above green field rates to the local ditches/Hazelbrook Stream.
- Sustainable urban drainage measures, including green roofs, permeable paving, and filter strips/swales will be provided to improve water quality.
- A petrol interceptor will be installed to prevent hydrocarbons entering the local drainage system at all outfalls.
- Regular inspection and maintenance of the drainage network, including petrol interceptors.
- Water metering via district meters will be installed to Irish Water requirements. Monitoring of the telemetry data will indicate any excessive water usage which may indicate the potential for a leak in the watermain network. Early identification of potential leaks will lead a faster response in determining the exact location of leaks and completion of remedial works.

It is not envisaged that any further remedial or reductive measures will be necessary upon completion.

7.9 Predicted Impacts of the Proposed Development

Construction Phase:

Due to the proposed remedial measures outlined above no significant adverse impacts are expected to arise during the construction phase of the proposed development on the water supply network. There will be a minor increase in water demand and foul water outflow during the period of construction.

Operational Phase:

Due to the proposed mitigation measures outlined above many of the potential impacts will not arise during the operational phase of the proposed development on surface water and groundwater quality.

Surface water discharge from the site will be restricted by means of attenuation, therefore, no adverse impact in respect of flooding downstream will arise from the proposed development.

The installation of a Sustainable Urban Drainage System will ensure surface water runoff will be of high quality before discharge to the local ditch network/stream and will not have an impact on the receiving waters downstream of the development.

There will be a water demand for the proposed development of approximately 145m^3 per day. Irish Water have confirmed in their Confirmation of Feasibility Letter that the existing network has sufficient capacity to cater for the development with a requirement for minor local upgrade to facilitate the proposed development.

There is not anticipated to be any issues associated with the foul network during the operation phase based on the full incorporation of the mitigation measures during the construction phase. The impact following the operational phase mitigation measures outlined above is imperceptible. The increase in outflow volume to the public network has been calculated to be approximately 158m^3 when the development is fully occupied.

7.10 Worst-Case Scenario

The worst-case scenario in relation to hydrology and hydrogeology during construction phase would be the failure to implement the mitigation measures outlined above. This may result in the contamination of the receiving surface water network and/or groundwater.

In relation to the operation stage, the worst case would be the flooding of the surface water drainage network. In this regard, the network has been designed to accommodate a 20% increase in flows due to climate change. Finished floor levels have also been set with appropriate freeboard and an overland flood route through the site has been provided.

Implementation of the mitigation measures outlined in this document will reduce the risk of the worst-case scenario occurring, making this unlikely.

7.11 Monitoring

Construction Stage

Implementation of the Construction Management Plan is required to protect the hydrology and groundwater elements of the subject lands during construction stage. Maintenance of the mitigation measures and monitoring of the management processed is required to ensure best practice.

The monitoring measures to be implemented include:

- Monitoring of the management and storage of dangerous chemicals and fuel.
- Monitoring and maintenance of the wheel wash facilities.
- Regular maintenance and monitoring of the sediment control measures.
- Monitoring and maintenance of the SUDS features, road gullies and, attenuation ponds during the construction phase of the development.

Operational Stage

Monitoring and maintenance of the foul water pumping station water metering, telemetry, SUDS features, road gullies, attenuation and flow control devices are imperative during the operation phase of the development.

7.12 Reinstatement

No reinstatement is anticipated on site with respect to the Water environment.

7.13 Interactions

The main interactions relating to this EIAR Chapter are Land & Soils, Biodiversity and Utilities.

During construction stage, the connection of wastewater services has the potential to impact groundwater and soils if wastewater were to leak from the network during the construction process. There are potential implications for the local populations if there is a disruption to utility services during the connection of the new services to the proposed development. The construction of the various services will also interact with construction traffic as outlined in the Traffic and Transport Chapter.

During the operation stage, the water supply and foul drainage services have a potential interaction with the available water supply and with potential pollution to natural water bodies.
In respect of Land & Soils, interaction between surface and ground water and the bedrock geology is feasible. The implementation of the mitigation measures outlined in this chapter will reduce the potential of surface contaminants into the underlying geology.

In respect of Biodiversity, there is interaction between hydrology and the downstream habitats present along the Hazelbrook Stream & Sluice River. The mitigation measures ensure that surface water runoff is treated to the required standards so that downstream habitats are not negatively impacted.

7.14 Difficulties Encountered

There were no particular difficulties encountered compiling the Water chapter of the EIAR.

7.15 References

Guidelines on the information to be contained in Environmental Impact Assessment Reports (EIAR), (2022), Environmental Protection Agency

Environmental Protection Agency available at http://gis.epa.ie/EPAMaps/

Geological datasets available at www.gsi.ie

Greater Dublin Strategic Drainage Study (GDSDS), (2015), Dublin Drainage

Fingal Development Plan 2023-2029 Strategic Environmental Assessment (SEA) Statement, (2023), Fingal County Council

OPWs National Flood Information Portal, https://www.floodinfo.ie/map/floodmaps/

8.0 Air

8.1 Introduction

Chapter 8 of this Environmental Impact Assessment has been prepared by DKP Environmental (DKPEV) and assesses the air quality impacts associated with the proposed development at Broomfield, Back Road, Malahide, Co. Dublin. The proposed residential development consists of a residential apartment duplex and house development. This chapter examines the existing air quality in the vicinity of the development site and the potential impact of the proposed development during the construction phase and operational phase. The assessment includes recommended mitigation measures to control and minimise the impact that the development may have on local air quality. This assessment has been prepared in accordance with the EIA Directive 2014/52/EC and current Environmental Protection Agency (EPA) guidelines. This section should be read in conjunction with the site layout plans and project description sections of this EIAR.

8.2 Research Methodology

Research for this section included a review of the Air Quality Standards Regulations (S.I. 180 of 2011) and the published EPA annual reports on air quality in Ireland. The existing air quality at the site was characterised using desk-based research of published information. Predicted air quality emissions for the main traffic-derived pollutants have been modelled using the screening air quality assessment from the U.K Highway Agency Design Manual for Roads and Bridges (DMRB) and data from the transport Assessment undertaken for Broomfield. Analysis for this chapter included a review of the following guidelines and recommendations:

- Environmental Impact Assessment of Projects: Guidance on the Preparation of the Environmental Impact Assessment Report (European Commission, 2017)
- Guidelines on the information to be contained in environmental impact assessment reports (EPA, 2022).
- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports Draft (EPA, 2017)
- Advice Note on Preparing Environmental Impact Statements – Draft (EPA, 2015)
- Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment 2013.
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment August 2018
- Guidance on the Assessment of Dust from Demolition and Construction Version 1.1 (Institute of Air Quality Management (IAQM), 2014)

8.2.1 Legislation and Guidelines

To reduce the risk of poor air quality impacts, National and European statutory bodies have set limit values in ambient air for a range of air pollutants. EU directives set baseline standards for monitoring air quality and reducing emissions. 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 a number of pollutants. These limits are for the protection of human health and are presented in Table 8.1. Air quality significance criteria are assessed on the basis of compliance with the standards.

Pollutant	Limit Value Objective	Averaging Period	Limit Value µg/m³	Limit Value ppb	Basis of Application of the Limit Value	Limit Value Attainment Date
Sulphur Dioxide (SO_2)	Protection of human health	1 hour	350	132	Not to be exceeded more than 24 times in a calendar year	01-Jan-05
SO_2	Protection of human health	24 hours	125	47	Not to be exceeded more than 3 times in a calendar year	01-Jan-05
Nitrogen Dioxide (NO_2)	Protection of human health	1 hour	200	105	Not to be exceeded more than 18 times in a calendar year	01-Jan-10
NO_2	Protection of human health	calendar year	40	21	Annual mean	01-Jan-10
Particulate Matter (PM_{10})	Protection of human health	24 hours	50		Not to be exceeded more than 35 times in a calendar year	01-Jan-05
PM_{10}	Protection of human health	calendar year	40		Annual mean	01-Jan-05
Particulate Matter ($PM_{2.5}$) Stage 1	Protection of human health	calendar year	25		Annual mean	01-Jan-15
$PM_{2.5}$ Stage 2	Protection of human health	calendar year	20		Annual mean	01-Jan-15
Lead	Protection of human health	calendar year	0.5		Annual mean	01-Jan-05
Carbon Monoxide (CO)	Protection of human health	8 hours	10,000	8620	Not to be exceeded	01-Jan-05
Benzene	Protection of human health	calendar year	5	1.5	Annual mean	01-Jan-10

Table 8.1: Air quality standards regulations (S.I.180)

8.2.2 National air quality network

The EPA is the authority with responsibility for ambient air quality monitoring in Ireland and measures the levels of atmospheric pollutants. Ambient air quality monitoring is carried out in accordance with the requirements of the CAFE Directive which has been transposed into Irish national legislation by the Air Quality Standards Regulations 2011. For the purposes of detailing ambient air quality in Ireland, it is divided into four zones: Zone A: Dublin, Zone B: Cork, Zone C: Other cities and large towns, Zone D: Rural Ireland. In Ireland, the network is managed by the EPA in partnership with Local Authorities and other public/semi-state bodies. A series of monitoring stations are located across the country, these stations collect air quality data for public information. The proposed development site is located within Zone A, Dublin. The EPA monitor at local sites and national sites. The nearest local EPA air quality monitoring station from the development site is Swords Council Depot, Co. Dublin, see image 8.1. These local monitoring stations give people a rapid and up-to-date indication only, of air quality in their locality.

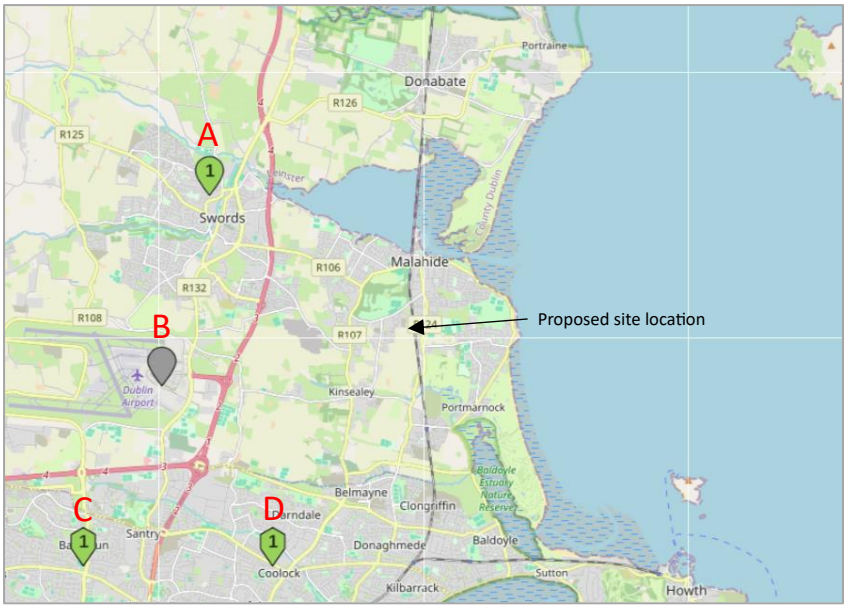


Image 8.1: EPA air quality monitoring stations close to the proposed development.

EPA monitoring stations					
Image 8.1 location ref	Location	EPA Station ref no.	Location description (Roadside/ background/ rural)	Distance from proposed development (km)	Currently monitoring (Oct 2024)
A	Swords Council Depot, Co. Dublin	61	background	5.0	PM10, PM2.5, NO2, O3
B	Dublin Airport, Swords, Co. Dublin	55	roadside	5.9	Issue: No data received since 01:00 on Jul 10, 2024
C	Ballymun Library, Dublin 9	TNO4437	background	9.0	PM10, PM2.5
D	Coolock, Dublin 5	TNO2162	background	6.2	PM10, PM2.5

Table 8.2: EPA air quality monitoring stations close to the proposed development.

8.2.3 Dust deposition guidelines

The concern from a health perspective is focussed on particles of dust which are less than 10 microns (PM10) and less than 2.5 microns (PM2.5) and the EU ambient air quality standards outlined in Table 8.1 have set ambient air quality limit values for PM10 and PM2.5. With regards to larger dust particles that can give rise to nuisance dust, there are no statutory guidelines regarding the maximum dust deposition levels that may be generated during the construction phase of a development in Ireland. To measure dust deposition a figure of 350 mg/m2/day (as measured using Bergerhoff type dust deposit gauges as per German Standard Method for determination of dust deposition rate, VDI 2129) can be applied to ensure that no nuisance effects will result. The National Roads Authority (NRA) has published guidance for assessing dust impacts at a local level from road construction. The guidelines outline an assessment method for predicting the impact of dust emissions from construction activities based on the scale and nature of the works and the sensitivity of the area to dust impacts. This is examined further in the impact section.

8.3 Receiving Environment at Broomfield, Malahide

Malahide is a coastal area in Fingal, County Dublin, situated approximately 18 km north-east of Dublin city. The site is approximately 2km from the Malahide town centre. The development site has residential housing (Ashwood Hall) to the west, a number of private dwellings to the north. To the south there is green agricultural fields. Immediately east is the Malahide railway line, beyond the rail line is more residential houses. Overall, the proposed development area is located within an area which includes sources of transportation related air emissions, local residential estates/houses sources of domestic heating. The EPA ambient air quality data has been used to characterise the existing air quality in the area.

8.3.1 EPA Air Quality Monitoring Results

The EPA publish annual reports on air quality in Ireland. These reports can be accessed via the EPA website at www.epa.ie. The most current EPA report ' Air Quality in Ireland 2023' has been examined in order to describe the existing air quality conditions and to provide information on background concentrations. The ambient air quality data collected and reviewed for the purpose of this study focused on the principal substances (NO2, CO and PM emissions) which may be released from the site during the construction and operation phases, and which may exert an influence on local air quality. The proposed residential development site is located within Zone A, the Dublin conurbation. The EPA publish official data only from the national monitoring station on a yearly basis. The nearest national and local EPA air quality monitoring station from the development site is Swords, Council Depot, Co. Dublin approximately 5km away. Table 8.3 shows the annual mean value concentrations measured at Swords for 2023, 2022, 2021, 2020, 2019 and 2018. Given the location and similar urban environment the long-term monitoring data at swords has been used to describe background concentrations for key pollutants in the region of the proposed development.

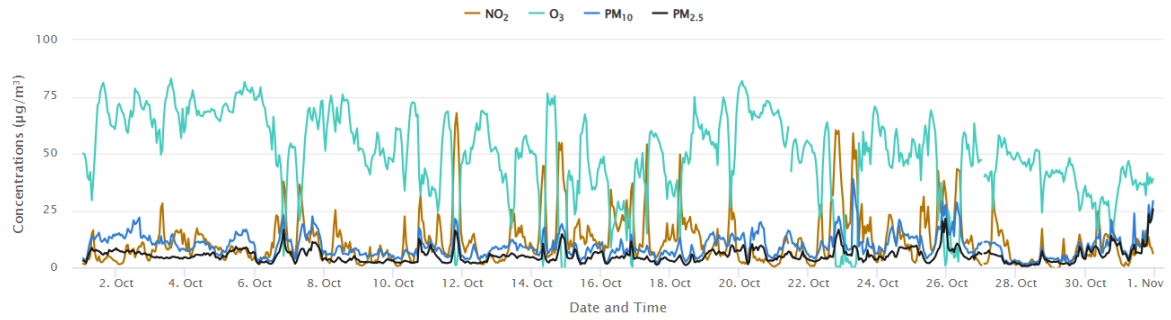
Pollutant (mean concentration)	2023	2022	2021	2020	2019	2018	Annual limit for protection of human health
($\mu g/m^3$)							
Sulphur Dioxide (SO_2)	2.6 *	2.7 *	2.30 *	2.98 *	1.50 *	2.10 *	20
Particulate Matter (PM_{10})	12.2 *	13.5 *	12.0 *	13.10 *	14.5 *	14.10 *	40
Particulate Matter ($PM_{2.5}$)	6.7 *	7.7 *	7.65 *	7.60 *	9.20 *	8.55 *	20
Nitrogen Dioxide (NO_2)	10.3	12.3	11.4	11.0	15.0	16.0	40
Carbon Monoxide (CO) (mg/m^3)	0.15 *	0.20 *	0.35 *	0.30 *	0.30 *	0.20 *	10
Benzene	0.6 *	0.46 *	0.35 *	0.52 *	0.16 *	0.30 *	5
Lead (Pb)	0.03 *	0.05 *	0.09 *	0.04 *	0.07 *	0.06 *	0.5
Ozone (O3)	54.0	54.4	51.9	53.0	53.0	54.0	120

Table 8.3: Summary of data from the EPA ambient air monitoring report 2023 - 2018.

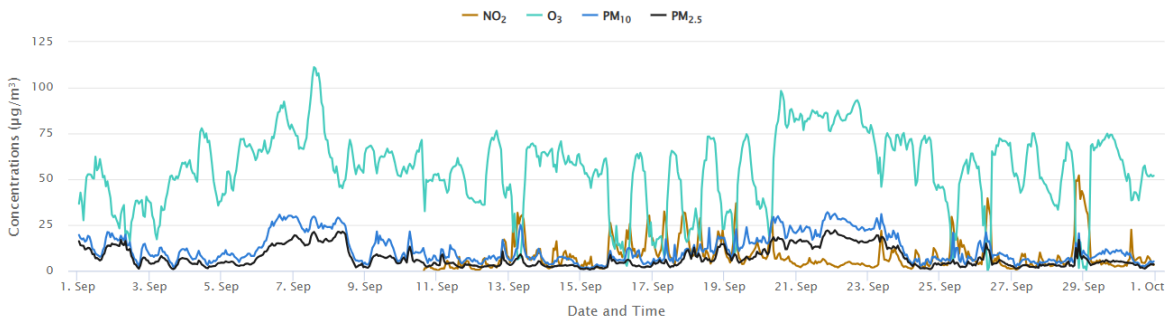
* = Swords Council Depot monitoring station does not record all ambient air quality parameters outlined in the Directive. Therefore, air quality in the receiving environment was assessed using the average annual mean value concentrations from all measured monitoring stations in Zone A.

8.3.2 EPA air quality index for health

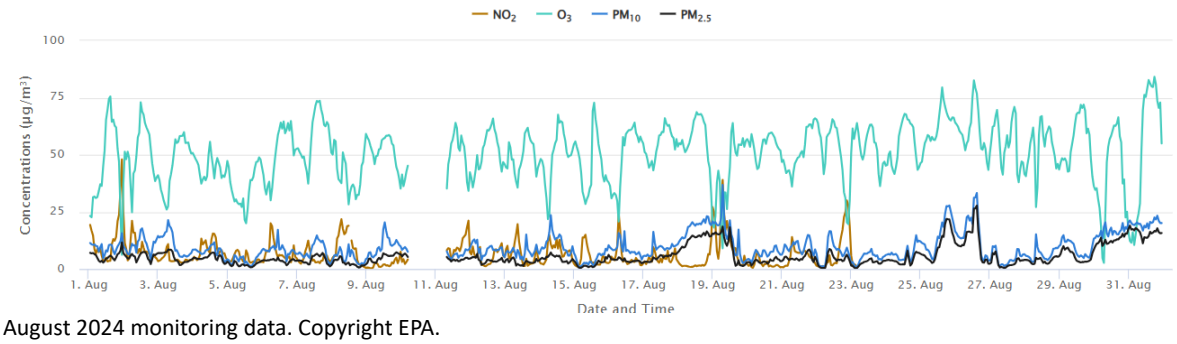
The EPA's air quality index for health (AQIH) is a number from 1 to 10 that tells you what the air quality currently is and whether or not this might affect the health of an individual. A reading of 10 means the air quality is very poor and a reading of one to three inclusive means that the air quality is good. These local monitoring stations give people a rapid and up-to-date indication only, of air quality in their locality. Local monitoring data can be obtained only up to a couple of months previous. The nearest local EPA air quality monitoring station from the development site is also Swords, Council Depot. The previous 6 months graphs for Swords NO2, PM2.5, PM10 and O3 emissions are illustrated below.



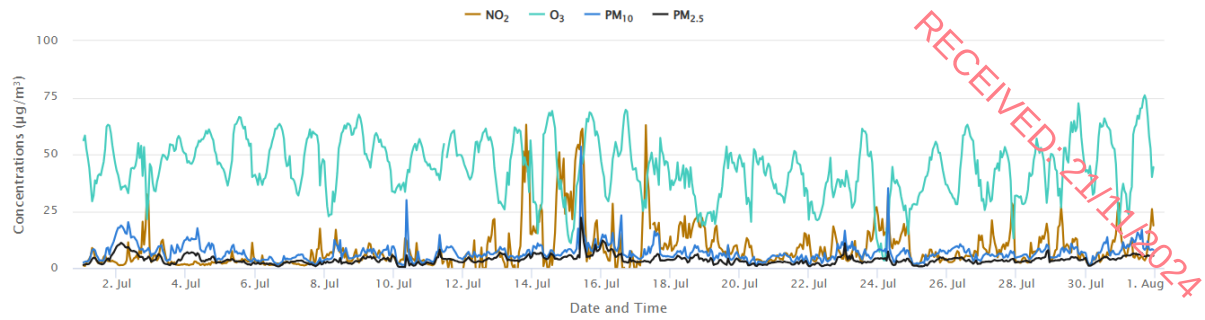
October 2024 monitoring data. Copyright EPA.



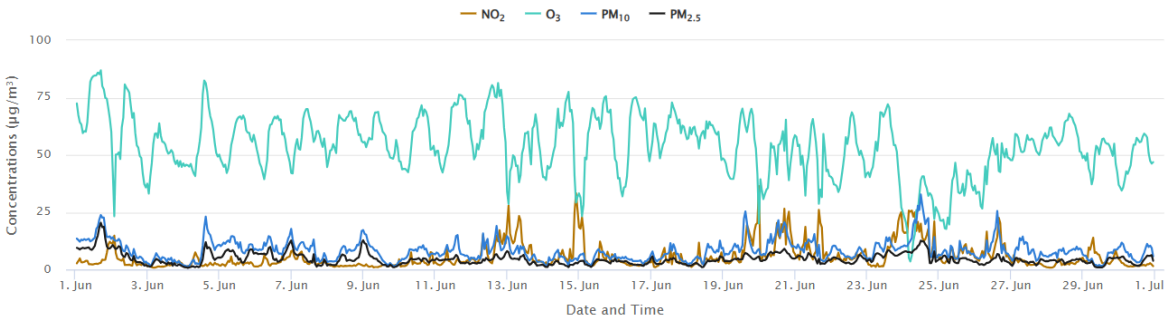
September 2024 monitoring data. Copyright EPA.



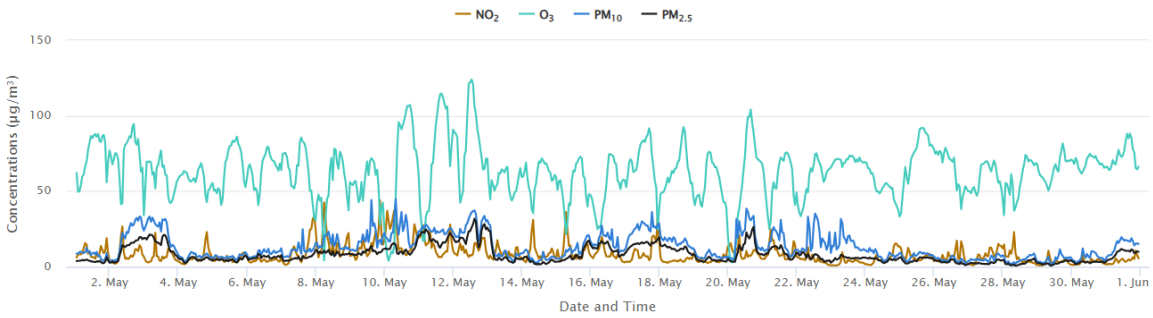
August 2024 monitoring data. Copyright EPA.



July 2024 monitoring data. Copyright EPA.



June 2024 monitoring data. Copyright EPA.



May 2024 monitoring data. Copyright EPA.

8.3.3 Significance of EPA Results

The national recorded levels of pollutants show the air quality parameters are all below the air quality limit values. The monthly monitoring data indicates the AQIH mostly falls into the category of index 1 and 2. Data shows on occasion air quality fluctuates to index 3 for O3, PM_{10} and $PM_{2.5}$ but both would still in the band of 'Good' air quality in terms of health for people in the vicinity. It can be seen that the existing baseline air quality at the site locality can be characterised as being good with no exceedances of the National Air Quality Standards Regulations limit values of individual pollutants.

8.3.4 Sensitive receptors

The principal local receptors, see image 8.2, that may be impacted by the development are existing residential dwellings to the north on back road and north-east. To the east there are residential housing 'Broomfield', and Galtrim Grange apartments/houses. West of the proposed is an estate of residential housing 'Ashwood Hall Houses' the closest dwelling is 5m from the development.

Image 8.2: Principal local receptors close to proposed site dwellings. Imagery © Google 2024.

8.4 Impact Assessment

When considering a new development, the impact on air quality must be considered for each distinct stage; construction phase and operational phase It is important that there are no unacceptable decreases in ambient air quality levels predicted during the phases.

8.4.1 Construction Phase

The construction phase of the development has the potential to generate short term dust emissions and emissions from vehicle exhausts.

8.4.1.1 Dust emissions

Dust emissions can lead to elevated PM10 and PM2.5 concentrations and may also cause dust soiling. Dust will be generated from moving and transporting soil and materials in and around the construction site and on public roads. It is not easy to accurately quantify dust emissions arising from construction activities. A semi-quantitative approach is recommended by the National Roads Authority (NRA) Guidelines to determine the likelihood of a significant impact. The construction assessment criteria

reproduced from the NRA are set out in Table 8.4. Similar construction methodologies will be used during the proposed development therefore it is considered appropriate to adopt the criteria described below.

Source		Potential Distance for Significant Effects (Distance from source)		
Scale	Description	Soiling	PM_{10}	Vegetation Effects
Major	Large Construction sites, with high use of haul routes.	100m	25m	25m
Moderate	Moderate Construction sites, with moderate use of haul routes.	50m	15m	15m
Minor	Minor Construction sites, with minor use of haul routes.	25m	10m	10m

Table 8.4: Assessment criteria for the impact of dust from construction activities with standard mitigation in place (NRA 2011)

The proposed development is considered a moderate construction site, therefore, dust is unlikely to cause an impact at sensitive receptors beyond 50 m of the source with standard mitigation measures in place. North of the proposed development, the closest private residential dwellings on the back road is 27m and south east of the proposed development, the closest residential receptor is 39m. Ashwood Hall houses closest receptor is 5m. This receptor along with all the receptors within 50m of the proposed development and where dust impacts are deemed likely, avoidance and mitigation measures will be put in place to reduce the impact levels such as, wind breaks, barriers and frequent cleaning and watering of the construction site roads, detailed mitigation measures are outlined within the appendix to this chapter. Provided the dust minimisation measures outlined in the plan are adhered to, the air quality impacts during the construction phase will be short-term and not be significant.

8.4.1.2 Vehicle emissions

Vehicles such as HGV's travelling to and from the site during the construction phase have the potential to cause an increase to pollutant concentrations at nearby receptors. Small increases in levels to PM and pollutants related to increased traffic such as CO and NO2 can be predicted. However, relative to existing baseline levels and given the scale of plant and machinery involved the impact of the proposed development during construction will not have an adverse impact in concentrations above the limit of regulation values. Overall, with appropriate mitigation measures in place there will be no significant effects on air quality at sensitive receptors for the construction phase.

8.4.2 Operational Phase

The operational phase of the proposed development has the potential to result in an impact on local air quality primarily as a result of the increased traffic movements associated with the development and as a result of the requirements of new buildings to be heated.

8.4.2.1 Increased residential dwellings

The design and construction of buildings in accordance with National Building Regulations, The Irish Building Regulations Technical Guidance Document L, Conservation of Fuel & Energy, will ensure that

modern building materials are used and that the proposed development is designed to be thermally efficient resulting in a reduction in the volume of fossil fuels required to heat the buildings. The design of the proposed development has considered a number of sustainable and energy saving features such as efficient heating systems throughout the development, by using cleaner fuel choices and avoiding the use of solid fuels. Heat pump technology will be considered and the use of photovoltaic panels for the development.

8.4.2.2 Increased vehicle emissions

The operational phase of the proposed development has the potential to result in an impact on local air quality primarily as a result of the increased traffic movements associated with the development. It is envisioned that a proportion of the commuting residents will avail of the Bus Eireann and the local Iarnród Eireann rail service. Continued encouragement of public transport usage with Bus and train will significantly reduce the number of private vehicles exiting and entering the development. Along with the continued transition to electric vehicles will all reduce the impact of additional car engine exhaust emissions. The DMRB screening air dispersion model from the U.K Highway Agency Design Manual for Roads and Bridges Air Quality Assessment was used to assess the impact of increased traffic movements associated with the development. Projected transport figures from a recent traffic assessment were used to predict the concentrations of traffic-derived pollutants in future years. The model then combined background concentrations of pollutants, sourced from the EPA reports (6-year average values were used). Results were generated using an average speed of 30 km/h assuming congested traffic conditions for a worst-case scenario. 1 no. receptors (entrance location) was chosen, see receptor A on image 8.3 for the location. This area was chosen as a large proportion of the proposed developments vehicle traffic would pass this area, especially as this location is close to the retail section of the proposed. Air quality significance criteria are assessed on the basis of compliance with the national air quality limit values.

Image 8.3: Receptor location A.

Using the DMRB screening air dispersion model, pollutant concentrations in operational future years were predicted at the receptor location. In order to quantify the magnitude of change in pollutant concentrations, the descriptors in table 8.5. were used. To describe the significance of the impact, table 8.6 was then used. These descriptor tables are from the Transport Infrastructure Ireland Guidelines for the Treatment of Air Quality during the Planning and Construction of National Road Schemes which detail a methodology for determining air quality impact significance criteria for road schemes and has been adopted for this assessment. The degree of impact is determined based on both the absolute and relative impact of the proposed development. Results are compared against the 'Do-Nothing' scenario, which assumes that the proposed development is not in place in future years, in order to determine the degree of impact.

Magnitude of Change	Annual Mean NO_2 ($\mu g/m^3$)	No. of Days with PM_{10} concentration greater than 50 $\mu g/m^3$	Annual Mean PM ($\mu g/m^3$)
Large	Increase/decrease ≥4	Increase/decrease >4 days	Increase/decrease ≥2.5
Medium	Increase/decrease 2 - <4	Increase/decrease 3 or 4 days	Increase/decrease 1.25 - <2.5
Small	Increase/decrease 0.4 - <2	Increase/decrease 1 or 2 days	Increase/decrease 0.25 - <1.25
Imperceptible	Increase/decrease <0.4	Increase/decrease <1 day	Increase/decrease <0.25

Table 8.5: Definition of impact magnitude for changes in ambient air pollutant concentrations.

Absolute Concentration in Relation to Objective /Limit Value	Changes in Concentration		
	Small	Medium	Large
Increase with Scheme			
Above Limit Value with Scheme (≥40$\mu g/m^3$ of NO_2 or PM_{10}) (≥25$\mu g/m^3$ of $PM_{2.5}$)	Slight Adverse	Moderate Adverse	Substantial Adverse
Just Below Limit Value with Scheme (36-<40$\mu g/m^3$ of NO_2 or PM_{10}) (22.5-<25$\mu g/m^3$ of $PM_{2.5}$)	Slight Adverse	Moderate Adverse	Moderate Adverse
Below Limit Value with Scheme (30-<36$\mu g/m^3$ of NO_2 or PM_{10}) (18.75-<22.5$\mu g/m^3$ of $PM_{2.5}$)	Negligible	Slight Adverse	Slight Adverse
Well Below Limit Value with Scheme (<30$\mu g/m^3$ of NO_2 or PM_{10}) (<18.75$\mu g/m^3$ of $PM_{2.5}$)	Negligible	Negligible	Slight Adverse

Table 8.6: Air quality impact descriptors for changes in annual mean NO_2, PM_{10} and $PM_{2.5}$ concentrations.

The results of the impact assessment at Receptor A arising from increased transport are presented in Table 8.7. The results predict the 2036 air quality relative to the existing baseline.

Receptor A	Annual Average NO_2 ($\mu g/m^3$)	Annual Average PM_{10} ($\mu g/m^3$)	Annual Average PM2.5 ($\mu g/m^3$)	Annual Average SO2 ($\mu g/m^3$)
Background	12.67	13.23	7.9	2.36
Limits	40	40	20	20
Do Nothing	13.14	13.76	8.15	2.56
Increase	+0.47	+0.53	+0.25	+0.20
Magnitude	small	small	imperceptible	imperceptible
Description	negligible	negligible	negligible	negligible
Do Something	13.46	14.11	8.49	2.67
Increase	+0.79	+0.88	+0.59	+0.31
Magnitude	small	small	small	imperceptible
Description	negligible	negligible	negligible	negligible

Table 8.7: Modelled results for receptor A.

Predicted air quality index for health for future occupancy: Using the predicted operational traffic flow modelled data (which assumed constant congested traffic conditions at the site for worst case scenario) the air quality index for future occupancies health puts the site in an index 1 and 2 category. The previous 6 months of local monitoring data indicate that the area is mostly in an index 1 and 2 category with a few occasions of levels recorded at index 3 for PM10 readings. These predicted air emissions at the site still have the same health advice for people which is 'Enjoy your usual outdoor activities'. At-risk groups of the population have the same health advice in index 1, 2 & 3 of 'Enjoy your usual outdoor activities'. The predicted AQIH is good for future occupancy. It is worth noting any measures to promote and improve using public transport, cycling, walking, car sharing or a combination of these as alternatives to single occupancy private car travel could potentially improve the AQIH in the future.

Summary of modelling assessment: Levels of traffic-derived air pollutants for the development at receptor A show an expected increase in annual NO2, PM10, PM2.5 and SO2. The impact equates to a 'small' increase (based on the NRA criteria) in annual averages. Using the NRA significance criteria, it results in a 'negligible' impact in terms of local impact as a result of increased traffic (the model assumed constant congested traffic conditions for a worst case scenario). In summary, the modelled results do show an increase in annual emissions to air quality but each remain well below the limit values for EU regulations. This predicted increase above the existing situation results in a negligible impact and would not result in a perceptible change in the existing local air quality environment.

8.5 Interactions and Cumulative Effects

Cumulative impacts of this and other developments in the Malahide area (as set out below) were considered in combination with the following plans and projects which were relevant to the subject lands:

- Reg. Ref. F24A/0842E permission sought for development of a proposed temporary construction road off Kinsealy Lane to facilitate the implementation of the approved development under ABP-313361-22 on the southern portion of the lands at Back Road & Kinsealy Lane, Kinsaley, Broomfield, Malahide, Co. Dublin (due decision 14th November 2024).
- Reg. Ref. F23A/0586 permission granted for construction of 71 no. residential units on the southern portion of the lands at Back Road & Kinsealy Lane, Kinsaley, Broomfield, Malahide, Co. Dublin. This permission also includes a temporary construction road off Kinsealy Lane on the site

covered by this application. Additionally, permission has been granted for 87 residential units on the same southern portion of the lands at Back Road & Kinsealy Lane.

- Reg. Ref. F21A/0451 permission granted for proposed upgrade of the existing foul water storage tank to provide for a pumping station with increased storage capacity, new sewer and rising main along Kinsealy Lane with associated interceptions and manholes, boundary treatments, and all associated engineering and site works necessary to facilitate the development.
- The Broomfield SHD (ABP-313361-22) comprising the construction of 415 no. residential units & a creche on the lands at Back Road & Kinsealy Lane, Kinsaley, Broomfield, Malahide, Co. Dublin. By the Order dated 4th July 2024, An Bord Pleanála issued a split decision on the case to include a granted permission for construction of 87 no. residential units on the southern portion of the lands and a refusal on the northern portion of the lands.
- The Auburn House SHD (ABP-313360-22) comprising 368 no. residential units and a crèche on lands at Auburn House (Protected Structure), Little Auburn and Streamstown, Off Malahide Road and Carey's Lane, Back Road, and Kinsealy Lane, Malahide, Co. Dublin. With a decision date due 8th August 2022, the case is still under review by the Board. This delayed decision triggered concurrent lodgement of three planning applications on the lands, including 69 no. dwellings under F22A/0579 - ABP-316444-23; 98 no. dwellings under F22A/0580 - ABP-316498-23; 92 no. dwellings under F22A/0581 - ABP-316504-23. By 29th March 2023, Fingal County Council granted planning permission for these applications; subsequently third-party appeals were lodged against the Council decisions and by Order dated 13th May 2024, An Bord Pleanála granted planning permission with revised conditions for all.
- Reg. Ref. F18A/0168 (ABP-303370-19) permission granted for alterations to previously approved development under Reg. Ref. F13A/0443 for construction of 32 no. residential units at Streamstown Wood, Streamstown Lane, Malahide, Co. Dublin. A third-party appeal was lodged against the Council's decision which was then withdrawn.
- Brookfield and Ashwood Hall Developments (Reg. Ref. F13A/0459 - PL06F.243863 - Reg. Ref. F13A/0459/E1 & Reg. Ref. F13A/0460 - PLO6F.243821 - Reg. Ref. F13A/0460/E1) are currently under construction/ nearing completion.
- 89 dwellings under the live pre-application at Lamorlaye, Back Road
- F24A/0988E – 9 no. residential units proposed at Ashwood Hall and Brookfield
- Retail anchor development proposal on lands adjoining Ashwood Hall

8.5.1 Construction phase

According to the IAQM guidance (IAQM, 2024) if the construction phase of the proposed development coincides with the construction phase of any other development within 500m then there is the potential for cumulative construction dust impacts. A review of relevant planning applications within 500m of the site was conducted in order to identify sites with the potential for cumulative impacts. The proposed development at Broomfield has been assessed as having no significant effects of dust soiling during the construction phase as a number of mitigation measures have been proposed in order to ensure significant dust impacts do not occur. Provided these measures are in place and adhered to for the duration of the construction phase, significant cumulative construction dust impacts are not predicted. Cumulative impacts to air quality will be short-term, localised and not significant.

8.5.2 Operational phase

The cumulative effects during the operational phase were assessed from changes in traffic flows during the operational phase. The traffic data supplied with other planning documents was used to assess the cumulative traffic. where such information was not available, conservative traffic figures were used to

predict increased operational traffic. The results of the impact assessment at the proposed development site arising from the cumulative developments are presented in Table 8.8. The results predict the air quality relative to the existing baseline.

Receptor A	Annual Average NO_2 ($\mu g/m^3$)	Annual Average PM_{10} ($\mu g/m^3$)	Annual Average PM2.5 ($\mu g/m^3$)	Annual Average SO2 ($\mu g/m^3$)
Background	12.67	13.23	7.9	2.36
Limits	40	40	20	20
Do Nothing	13.14	13.76	8.15	2.56
Increase	+0.47	+0.53	+0.25	+0.20
Magnitude	small	small	imperceptible	imperceptible
Description	negligible	negligible	negligible	negligible
Do Something	13.58	14.21	8.6	2.81
Increase	+0.91	+0.98	+0.70	+0.45
Magnitude	small	small	small	small
Description	negligible	negligible	negligible	negligible

Table 8.8: Modelled results for proposed development site with combined cumulative developments.

Modelled results show that concentrations of ambient air pollutants show a small increase in annual emissions to air quality but each remain well below the limit values for EU regulations, which are based on the protection of human health. The predicted cumulative impacts on air quality is negligible and would not result in a perceptible change in the existing local air quality environment. The effects are deemed long-term and not significant.

8.6 Mitigation and Monitoring Measures

Remedial and reductive measures are discussed for the construction and operational phase.

8.6.1 Construction Phase

In order to mitigate dust emissions and minimise air quality impacts during the construction phase, placing activities which are a potential source of dust away from boundaries with sensitive receptors as best possible would minimise the possibility of exposure. Standard mitigation measures would be implemented onsite to control emissions during construction, Full details of the dust management plan can be found in Appendix 1. Summary of mitigation measures include:

- Any required demolition works to be undertaken in a phased and controlled manner.
- The dampening down of potential dust generating activities.
- Avoid unnecessary vehicle movements and limit speeds on site so as to minimise the generation of airborne dust.
- Site roads shall be regularly cleaned and maintained as appropriate while any unsurfaced roads shall be restricted to essential site traffic only.
- location of temporary storage of dusty materials and material transfer operations as far from the nearest sensitive receptors as practicable.
- Exhaust emissions from vehicles operating within the construction site or other plant equipment, will be controlled by ensuring that emissions from vehicles are minimised by routine servicing of vehicles along with the avoidance of engines running unnecessarily.

- All vehicles which present a risk of spillage of materials, while either delivering or removing materials, will be loaded in such a way as to prevent spillage.
- Where drilling or pavement cutting, grinding or similar types of operations are taking place, measures to control dust emissions will be used by the erection of wind breaks or barriers.
- A complaints log shall be maintained by the construction site manager and in the event of a complaint relating to dust nuisance, an investigation shall be initiated.

8.6.2 Operational Phase

As outlined in the impact assessment no mitigation measures are required as the operational phase of the proposed development as it is predicted the operational phase will not generate air emissions that would have an adverse impact on local ambient air quality. Promoting sustainability by enhancing where possible the use of public transport to reduce dependency on the use of the private car. The inclusion of electric car charging points to encourage electric vehicle ownership is also a measure to help minimise the impact of the development on air quality.

8.6.3 Monitoring

Construction phase: If the construction contractor adheres to good working practices and the mitigation measures are in place, the levels of emissions generated are assessed to be minimal and are unlikely to cause an impact on air quality during the construction phase, there is no monitoring recommended.

Operational phase: There is no monitoring recommended for the operational phase of the development as impacts to air quality are predicted to be negligible.

8.6.4 Difficulties encountered in compiling the chapter

There were no difficulties met when conducting this assessment.

8.6.5 References

- EPA. Air Quality Monitoring Report 2023 (and previous annual reports)
- EPA. Ireland's Provisional Greenhouse Gas Emissions 1990 – 2019
- EPA Air Quality Index for health. AirQuality.ie
- TII (2011). Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes
- UK Highways Agency (2019b). UK Design Manual for Roads and Bridges (DMRB) Volume 11 Environmental Assessment, Section 3 Environmental Assessment Techniques, Part 14 LA 114 Climate
- Transport Infrastructure Ireland (TII) 2011 Guidelines for the Treatment of Air Quality during the Planning and Construction of National Road Schemes Revision 1.
- The Irish Building Regulations Technical Guidance Document L 'Conservation of Fuel & Energy Dwellings'

9.0 NOISE AND VIBRATION

9.1 Introduction

This chapter of this Environmental Impact Assessment has been prepared by DKP Environmental (DKP_{EV}) and assesses noise and vibration impacts associated with the proposed development at Broomfield, Back Road, Malahide, Co. Dublin. The proposed development (the project) that is subject to this LRD application and EIAR provides for the demolition of the former rugby clubhouse structure on site and the proposed construction of 297 no. residential units comprising 211 no. houses (14 no. 2 beds, 156 no. 3 beds, 39 no. 4 beds, and 2 no. 5 beds), 46 no. duplex units (9 no. 1 beds, 14 no. 2 beds, and 23 no. 3 beds), 40 no. apartments (23 no. 1 beds, 14 no. 2 beds, and 3 no. 3 beds); 1 no. childcare facility; 1 no. café/restaurant; 1 no. retail unit; 1 no. yoga studio; and all associated site infrastructure and engineering works necessary to facilitate the development. A temporary foul water pumping station is also proposed as part of the development.

This chapter will identify and assess the impact of the proposed development in terms of noise and vibration during the construction phase and operational use with particular attention to the nearby residential units. Increased traffic volumes associated with the subject site is likely to be the main impact source. Traffic volumes for the proposed scheme have been projected in the traffic analyses chapter and therefore the noise impact assessment for the operational phase of the subject site will consider the cumulative impact of the existing and new predicted volumes.

This assessment was prepared in accordance with the EIA Directive 2014/52/EC and current EPA guidelines. This section should be read in conjunction with any guidance documents for the site and project description sections of this EIAR.

9.2 Research Methodology

9.2.1 Construction Noise Criteria

The level of environmental noise generated during the construction phase of any development is determined primarily by the exact construction methods employed. The level of the noise impact of these methods will arise from the specific sound power levels generated by the plant and machinery used, the duration of each particular construction activity, as well as the time and location in which the equipment is used. The potential sources of environmental noise during the construction phase of the development will primarily arise from increased traffic on the surrounding roads (from construction workers and delivery of plant and materials) and actual on-site works where plant and machinery will be deployed.

As at this point of time we do not have an any actual specific construction plan to outline details of plant and machinery to be used, materials, construction phasing and working hours) it is not possible to accurately model construction noise levels using the recommended standard ISO 9613:1996 - Acoustics, Attenuation of sound during propagation outdoors however a basic analysis of worst-case noise levels has been calculated. This basic calculation was based on the current construction methods applied on site to complete the works and assessed noise impacts for the anticipated construction equipment.
As we do not have any published statutory Irish guidance relating to the maximum permissible noise level that may be generated during the construction phase of a project however local authorities normally control construction activities by imposing limits on the hours of operation with certain noise

limits at their discretion. For this report we applied the British Standard BS 5228-1:2009+A1: 2014 - Code of practice for noise and vibration control on construction and open sites.

BS 5228-1:2009+A1: 2014 sets out a method of calculating the propagation of sound towards a receiver from the use of certain construction plant and machinery on a construction site. The standard describes single octave sound power level data for a range of standardised plant and machinery as would be expected to be the norm on construction sites.

9.2.2 Construction Vibration Criteria

During the construction phase of a development certain aspects of the site work may result in increased levels of vibration in the vicinity of the site. BS 5228-2:2009+A1:2014 - Code of practice for noise and vibration control on construction and open sites: - Part 2: Vibration, outlines a number of calculation methods for predicting peak particle velocity (PPV) resulting from construction works on open sites.

The prediction methods require specific information relating to the soil composition and compaction levels within the propagation path between the construction area and nearest receiver, as well as highly detailed information regarding the type and location of plant and machinery. As such specific data is not available a quantitative impact of vibration will not be undertaken as part of this assessment. Construction practices employed should have regard to best practice as recommended in the following standards and guidance:

- BS 7385-1 (1990) Evaluation and Measurement for Vibration in Buildings - Guide for Measurement of Vibration and evaluation of their effects on buildings.
- BS 7385-2 (1993) Evaluation and Measurement for Vibration in Buildings - Guide to damage levels from Ground borne Vibration.
- BS 5228-2:2009+A1:2014 - Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration.
- BS 6472-1 (2008) Guide to evaluation of Human Exposure to Vibration in Buildings - Vibration sources other than Blasting.

9.2.3 Operational Noise Criteria

As we do not have any statutory limits, it is therefore necessary to reference appropriate best practice guidance and standards in order to determine the impact of the subject site on the noise climate in the surrounding area during the operational phase. It is important to note that the primary potential source of noise arising during the operational phase is that of road traffic associated with the increased population of the area.

For the calculation and assessment of road it has generally been best practice to assess road traffic noise on the basis of the LA10 18-hour parameter as outlined in the CRTN document. Transport Infrastructure Ireland (formerly the National Roads Authority (NRA)) have produced guidelines for national road schemes however in this development we do not have any national primary road hence this standard would not apply.

The World Health Organisation propose guideline values for the prevention of moderate and serious nuisance in outdoor areas as 50dB LAeq (16 hour) and 55dB LAeq (16 hour) respectively although a more appropriate criteria for assessing disturbance or annoyance from noise arising from the site would be related to the significance of changes in noise levels as perceptible to human beings.

The information in the table below is taken from the 'Guidelines for Noise Impact Assessment' produced by the Institute of Environmental Management and Assessment (IEMA). This document replaces the draft guidelines published by the Institute of Acoustics (IOA) and IEMA in April 2002 and shows an appropriate impact.

Change in Noise Level	Subjective Reaction	Impact Guidelines for Noise Impact assessment significance	Impact Guidelines on the Information to be contained in EIAR's (EPA)
0 dB	No change	None	Imperceptible
0.1 to 2.9 dB	Barely perceptible	Minor	Slight
3.0 to 4.9 dB	Noticeable	Moderate	Moderate
5.0 to 9.9 dB	Up to a doubling or halving of loudness	Substantial	Significant
10 dB or more	More than a doubling or halving of loudness	Major	Profound

Table 9.1: Guidelines for Noise Impact Assessment (IEMA).

The following tasks were carried out in order to assess the noise impacts of the subject site on identified receptors during the operational phase of the scheme:

- A survey has been conducted to establish baseline noise levels or background noise levels at the nearest noise sensitive receptor surrounding the site.
- A calculation of anticipated noise levels arising at the nearest noise sensitive receptors due to current and forecast increases in traffic arising from the subject site as per basis of the LA10 18hour parameter as outlined in the CRTN document.
- An assessment of the cumulative calculated anticipated noise levels and potential impact upon noise sensitive receptors was carried out with reference to best practice guidelines in the assessment of environmental noise.

9.2.4 Vibration Assessment Criteria

There are generally accepted criteria for vibration levels that would be likely to lead to complaints and vibration levels that would be likely to lead to structural damage. These levels are outlined in the guidance documents BS6472: 1992 Guide to Evaluation of human exposure to vibration in buildings (1Hz to 80Hz), and BS7385: Part 2 1990: Evaluation and measurement for vibration in buildings - Guide to damage levels from ground-borne vibration.

9.2.5 Operational Vibration Criteria

Traffic has been identified as the only likely source of vibration during the operational phase of the scheme. In the case of nominally continuous sources of vibration, such as traffic, vibration is perceptible at around 0.5 mm/s PPV and may become disturbing or annoying at higher magnitudes. Currently no major sources of vibration exist on the site. It would therefore be appropriate to assume that negligible vibration impacts will occur during the operation of the subject site and no further assessment is deemed to be required.

9.3 Receptor Location Identification

In this chapter an assessment was made on receptor location having due regard to several considerations including:

- Determining the most exposed or nearest sensitive receptor (NSR) to potential sources of environmental noise related to current and future increases in traffic volumes.
- Ensuring that the number of receptors assessed would allow for sufficient baseline data to be obtained in the allocated background measurement period but also that the spatial spread of receptor locations was such that all locations in and around the subject site were assessed.

The table below represents the background noise monitoring locations chosen and image 9.1 highlights these monitoring stations on a site map.

Table 9.3.1: Background noise monitoring locations.

Measurement location	Location	Measurement Type	Justification
Station 1	Back Road	Unmanned	To determine back ground noise levels
Station 2	Railway line	Unmanned	To determine back ground noise levels
Station 3	Site (nearest receptor)	Unmanned	To determine back ground noise levels

Image 9.1.1: receptor locations highlighted in yellow.

9.3.1 Calculated Noise levels

For the anticipated road traffic noise levels and cumulative noise levels the measured noise level data was applied and calculated on the basis of the LA10 18hour parameter as outlined in the CRTN document issued by Transport Infrastructure Ireland (formerly the National Roads Authority (NRA)). Using the traffic chapter for the increased volume of traffic on the Back Road being the road taking traffic in and out of the new proposed development.

9.3.2 Receiving Environment

Malahide is a coastal area in Fingal, County Dublin, situated approximately 18 km north-east of Dublin city. The site is approximately 2km from the Malahide town centre. The development site has residential housing (Ashwood Hall) to the west, a number of private dwellings to the north. To the south there is green agricultural fields. Immediately east is the Malahide railway line, beyond the rail line is more residential houses. Overall, the proposed development area is located within an area which includes sources of transportation related noise emissions, local residential estates/houses. The survey data in combination with the EPA noise map data has been used to characterise the existing noise environment in the area.

9.3.3 Back-ground Noise Survey

To assess the surrounding background noise levels, a daytime background noise survey was carried out on September 18th and 19th 2024. During the survey the 3 un-manned stations were monitored and at each station continuous 1 minute measurements were recorded during the period from 08:00 to 8:00 (24h). The measurements taken are deemed to be representative of typical noise levels on the relevant roads.

The measurements have been performed using a Bruel & Kjaer Type 2260 sound level meter and Bruel & Kjaer 4231 sound level calibrator. All measurements were carried out in accordance with ISO 1996: 'Acoustics-Description and measurement of environmental noise'. Weather conditions during the survey were in line with the conditions described within ISO 1996, Acoustics 'Description and Measurements of Environmental Noise'. Weather conditions were dry and cool with a moderate wind.

The following environmental noise parameters were measured which are defined below.

- **LAeq** is the A-weighted equivalent continuous steady sound level during the measurement period and effectively represents an average ambient noise value.
- **LAmax** is the maximum A-weighted sound level measured during the measurement period.
- **LAmin** is the minimum A-weighted sound level measured during the measurement period.
- **LA10** is the A-weighted sound level that is exceeded for 10% of the sample period; this parameter is typically used to quantify traffic noise.
- **LA90** is the A-weighted sound level that is exceeded for 90% of the sample period; this parameter is typically used to quantify background noise.

Typical ranges of noise levels are presented in the table below comparing against the baseline noise levels measured:

Table 9.3: Typical ranges of noise levels.

Sound level (dB (A))	Description of Activity
0	Absolute silence
25	Very Quiet
35	Rural night-time
55	Suburban roadway 0.5km away
70	Busy Restaurant
85	Very busy pub, voice is raised to be heard
100	Rock concert
120	Uncomfortably loud, conversation impossible
140	Noise causes pain in ears

9.3.4 Back-ground Noise Survey Data

The following table are the measured and calculated (average) background noise levels from the 3 no. monitoring locations.

Table 9.4: background noise levels.

Station	Location (see map)	Sound level LAeq dB	Maximum noise level Lamax dB	Daytime period LA10day dB	Night-time period LA10night dB	Daytime period A90day dB	Night-time period LA90night dB
Station 1	Back Road	64	79	67	55	58	52
Station 2	GN Railway	66	91	76	61	66	53
Station 3	Nearest receptor	54	57	53	46	48	43

9.3.5 Basic Noise Measurement Overview

During daytime periods average ambient noise levels as a result of traffic were in the range of 64dB LAeq. Average background noise levels were in the range of 52dB LA90 and average LA10 values, typically used to describe traffic noise were in the range of 67dB, indicating that most of the measured noise levels would have arisen from traffic noise. We note that the site is also exposed to both aircraft and railway noise which is addressed in section 9.8 however both effects have no impact on the projects effect on the existing environment.

9.3.6 Back-ground Vibration Survey

Only minor vibration was observed during the noise measurements and therefore it has not been considered necessary to undertake baseline vibration monitoring as there is no evidence to suggest that existing receptors are currently affected by appreciable environmental vibration.

9.3.7 EPA noise contour maps

EPA noise contour maps available show Lden and Lnight contours. Lnight is the A-weighted long-term average sound level for the night time period (23.00 to 07.00). Lden – is the A-weighted long-term average sound level for the day-evening-night noise indicator in decibels (24 hours).

Image 9.3.1 EPA traffic noise map – Lden Day time 7.00 – 23.00 noise map

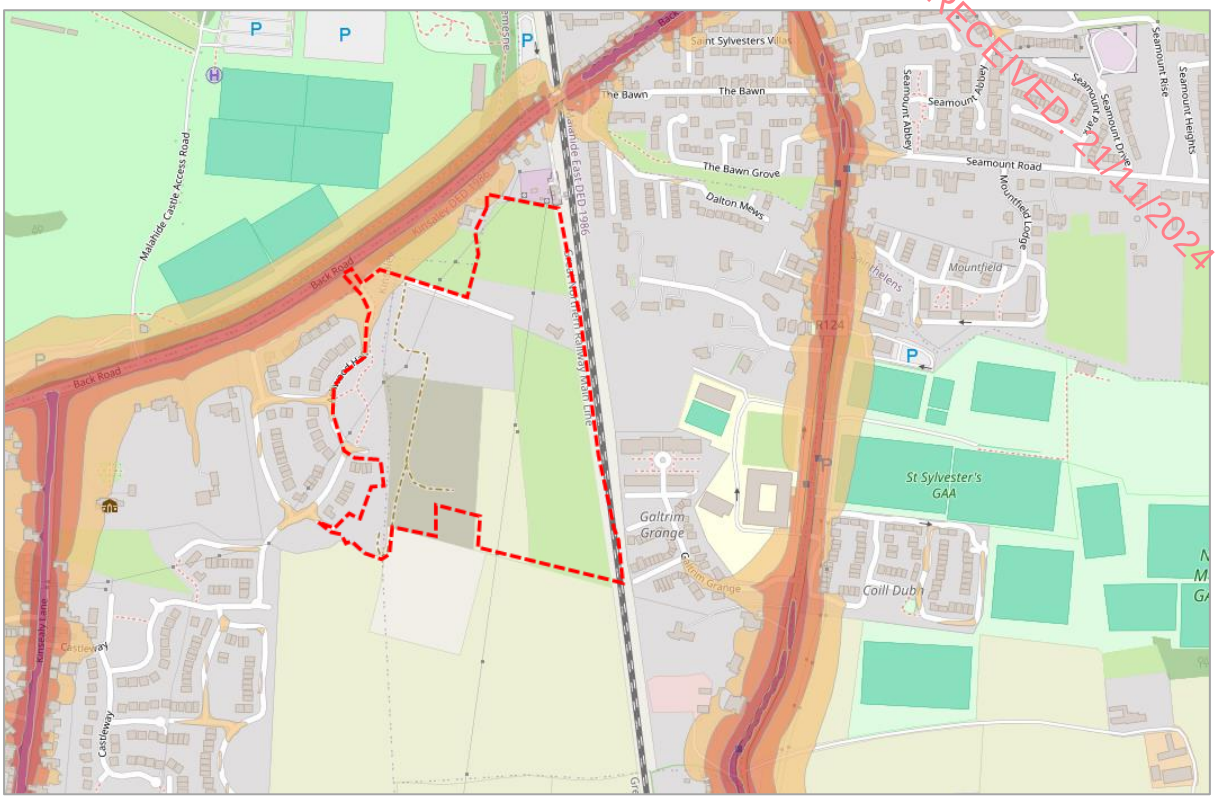
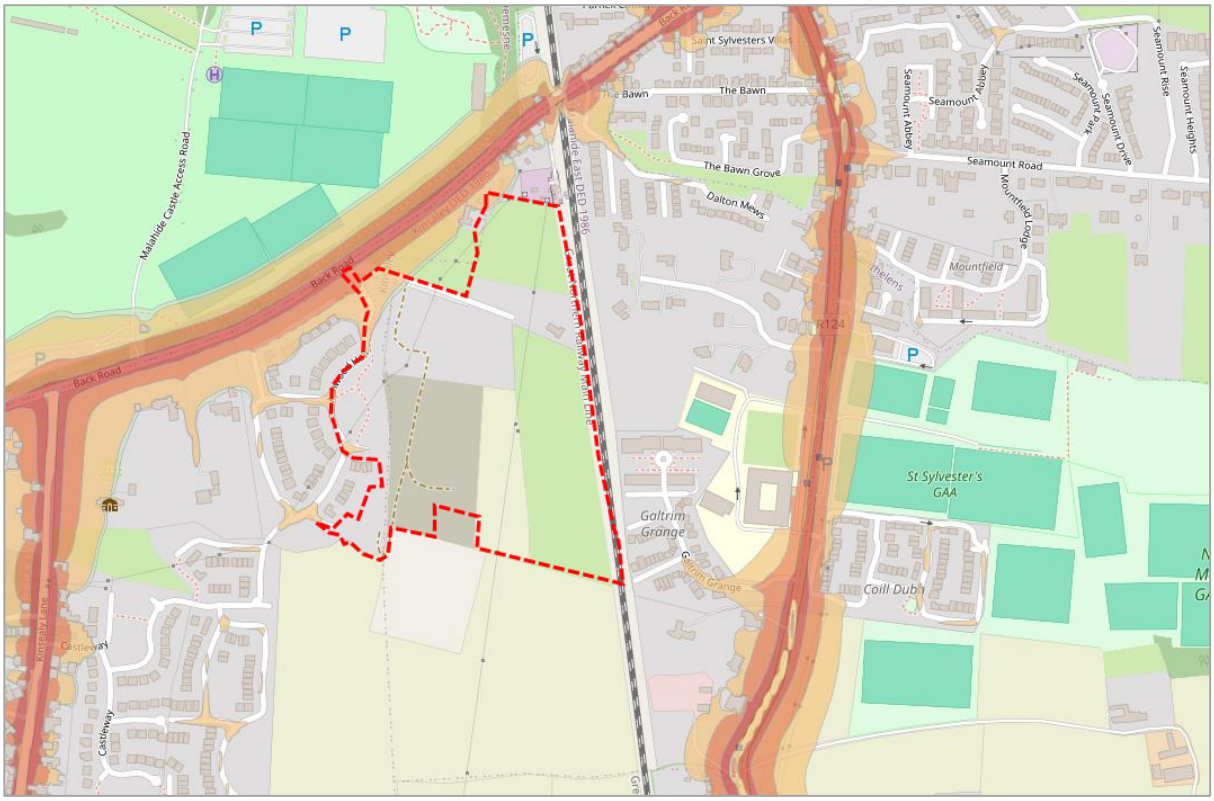


Image 9.3.2. EPA traffic noise map – Lnight Night time 23.00 – 7.00 noise map



9.4 Characteristics of the Proposed Development

The proposed development (the project) that is subject to this LRD application and EIAR provides for the demolition of the former rugby clubhouse structure on site and the proposed construction of 297 no. residential units comprising 211 no. houses (14 no. 2 beds, 156 no. 3 beds, 39 no. 4 beds, and 2 no. 5 beds), 46 no. duplex units (9 no. 1 beds, 14 no. 2 beds, and 23 no. 3 beds), 40 no. apartments (23 no. 1 beds, 14 no. 2 beds, and 3 no. 3 beds); 1 no. childcare facility; 1 no. café/restaurant; 1 no. retail unit; 1 no. yoga studio; and all associated site infrastructure and engineering works necessary to facilitate the development. A temporary foul water pumping station is also proposed as part of the development.

9.5 Potential Impact of the Proposed Development

The anticipated noise impacts on the surrounding environment must be considered for both the short-term impact of the construction phase and the operational phase.

9.5.1 Construction Phase

Short-term noise impacts are only to occur during the construction phase of the development due to the requirement to use plant and machinery on and to the construction site. In the absence of specific construction information regarding the construction stage, construction noise impacts cannot be fully quantified at this point, therefore sample calculations have been provided. Minor short-term vibration impacts may occur during the construction phase as a result of the use of heavy plant and machinery; however, these impacts will be unlikely to propagate beyond the construction site boundary.

9.5.2 Operational Phase

As per measured noise level data the main potential noise source that would be evident during the operational phase of the development would be that of increased road traffic noise associated with the subject site. In general, this can be categorised as:

- Residents small vehicular traffic in and out of the development site.
- Delivery and service vehicles servicing the dwelling houses.
- General activities, landscape maintenance, cleaning, energy producing equipment etc.
- Vibration is not anticipated to be a contributing factor in the operational phase.

9.6 Predicted Impact of the Proposed Development

9.6.1 Construction Noise

Using the method outlined in BS5228, a worst case LAeq value at potential NSRs at distances of 100m, 150m, 200m and 250m have been calculated for a range of construction plant. The following plant has been applied to give an example of the potential construction noise levels:

- Heavy delivery trucks.
- Ground works excavators.
- Noisy construction plant (mixers, vibrators).

We have used BS 5228-1:2009+A1: 2014 to anticipate/calculate the construction noise levels in the proposed development. This methodology relates to the method for construction vehicles/plant in a defined construction area. The prediction of the LAeq from construction plant operating over a small area or on site can be used for other activities when items of construction plant are operating in close proximity to the reception point, taking into account the adjustment of the predicted LAeq for standing and idling time of the plant. It is assumed that over a 1-hour period, all construction plant will be operational for 80% of the time. The results of these calculations are presented in the tables below.

Noise Source	Sound Power LWA dB
Heavy delivery truck	102
Ground works excavator	100
Noisy construction plant (mixers, vibrators)	106

Table 9.5: calculation results.

Distance of Potential NSR from construction site	Predicted Noise levels at NSR LAeq dB	BS5228-1 (2009)	
		Monday-Friday (07.00–19.00)	Saturday (07.00–13.00)
100m	**59**	**70**	**65**
150m	**56**		
200m	**53**		
250m	**51**		

Table 9.6: calculation results.

As most of the construction site will generally be within 100m of an occupied building the results of the indicative construction calculations shows that the resultant LAeq (1 hour) values of using such construction plant and vehicles would be in the region of 59db LAeq and below the maximum allowable day time ambient level of 70dB LAeq. BS5228-1 (2009) +A1: 2014 specifies that a daytime limit of 70dB LAeq shall apply on weekdays and a daytime limit of 65dB LAeq shall apply on Saturday.

The ambient noise levels at the nearest noise measurement location with construction noise (NSR2) are comfortably below the BS5228-1 limits and will be short-term in duration also. The construction phase generally has no noticeable change on the noise environment in the longer term.

9.6.2 Construction Vibration

We only anticipate minor temporary ground borne vibration events during the construction phase, but the exact impact of these vibration impacts cannot accurately be quantified.

9.6.3 Operational Noise

The anticipated noise impacts from the overall development during its operational phase will mainly be as a result of increased in comparison small vehicle traffic flows along the incoming and outgoing route into the proposed development site. It is anticipated that the additional road traffic noise

attributable to the development cumulatively with existing Back Road will result in an increase in the baseline noise environment by 1.1 to 1.3 dB(A).

The change in noise levels and the significance of such changes can be categorised by the Guidelines for Noise Impact Assessment, Institute of Environmental Management and Assessment. The table below details the impact/category.

Change in Noise Level	Subjective Reaction	Impact Guidelines for Noise Impact assessment significance	Impact Guidelines on the Information to be contained in EIAR's (EPA)
0 dB	No change	None	Imperceptible
0.1 to 2.9 dB	Barely perceptible	Minor	Slight
3.0 to 4.9 dB	Noticeable	Moderate	Moderate
5.0 to 9.9 dB	Up to a doubling or halving of loudness	Substantial	Significant
10 dB or more	More than a doubling or halving of loudness	Major	Profound

Table 9.7: Guidelines for Noise Impact Assessment, Institute of Environmental Management and Assessment.

Based on the table above and the anticipated increase in noise levels we deem the operational noise impact to be categorised as 'Slight' at the worst case. The increase in traffic associated with the proposed development scheme is therefore not expected to give rise to any significant noise nuisance in the area. We note that as part of the Government Climate Change action plan that petrol and diesel passenger vehicles are being phased out and replaced by quieter electric vehicles eventually leading to less operational noise.

9.6.4 Operational Vibration

Operational vibration is deemed not to have any noticeable impacts on the development.

9.7 Remedial and Reductive Measures

DKP_{EV} do not anticipate the requirement of any remedial measures but list the following recommendations mainly for the construction sites;

- Ensure that the local authority guidelines or planning directives to noise levels and operational times are adhered too.
- Prepare a construction phase operational plan with regards to limiting noise nuisance.
- Ensure all construction vehicles and plant are regularly maintained including any noise
- control measures such as attenuators, filters etc.
- Limit any construction noise spreading to neighbouring site by erecting temporary noise barriers (site boundary hoarding).
- Schedule particular high-level noise activities for times when increased noise levels are less sensitive or notify neighbouring residents or any sensitive sites.

9.7.1 Monitoring.

No noise monitoring is deemed necessary for the operational phase however noise monitoring will most likely be a requirement as directed by the local authority for the construction phase based on the local authorities imposed limits on the hours of operation and noise limits. No vibration monitoring is deemed necessary for both the operational and construction phase.

9.7.2 Interactions

The main interactions relating to noise and vibration are population and human health and transportation.

9.7.3 Cumulative effects

Cumulative impacts of this and other developments in the Malahide area (as set out below) were considered in combination with the following plans and projects which were relevant to the subject lands:

- Reg. Ref. F24A/0842E permission sought for development of a proposed temporary construction road off Kinsealy Lane to facilitate the implementation of the approved development under ABP-313361-22 on the southern portion of the lands at Back Road & Kinsealy Lane, Kinsaley, Broomfield, Malahide, Co. Dublin (due decision 14th November 2024).
- Reg. Ref. F23A/0586 permission granted for construction of 71 no. residential units on the southern portion of the lands at Back Road & Kinsealy Lane, Kinsaley, Broomfield, Malahide, Co. Dublin. This permission also includes a temporary construction road off Kinsealy Lane on the site covered by this application. Additionally, permission has been granted for 87 residential units on the same southern portion of the lands at Back Road & Kinsealy Lane.
- Reg. Ref. F21A/0451 permission granted for proposed upgrade of the existing foul water storage tank to provide for a pumping station with increased storage capacity, new sewer and rising main along Kinsealy Lane with associated interceptions and manholes, boundary treatments, and all associated engineering and site works necessary to facilitate the development.
- The Broomfield SHD (ABP-313361-22) comprising the construction of 415 no. residential units & a creche on the lands at Back Road & Kinsealy Lane, Kinsaley, Broomfield, Malahide, Co. Dublin. By the Order dated 4th July 2024, An Bord Pleanála issued a split decision on the case to include a granted permission for construction of 87 no. residential units on the southern portion of the lands and a refusal on the northern portion of the lands.
- The Auburn House SHD (ABP-313360-22) comprising 368 no. residential units and a crèche on lands at Auburn House (Protected Structure), Little Auburn and Streamstown, Off Malahide Road and Carey's Lane, Back Road, and Kinsealy Lane, Malahide, Co. Dublin. With a decision date due 8th August 2022, the case is still under review by the Board. This delayed decision triggered concurrent lodgement of three planning applications on the lands, including 69 no. dwellings under F22A/0579 - ABP-316444-23; 98 no. dwellings under F22A/0580 - ABP-316498-23; 92 no. dwellings under F22A/0581 - ABP-316504-23. By 29th March 2023, Fingal County Council granted planning permission for these applications; subsequently third-party appeals were lodged against the Council decisions and by Order dated 13th May 2024, An Bord Pleanála granted planning permission with revised conditions for all.
- Reg. Ref. F18A/0168 (ABP-303370-19) permission granted for alterations to previously approved development under Reg. Ref. F13A/0443 for construction of 32 no. residential units at Streamstown Wood, Streamstown Lane, Malahide, Co. Dublin. A third-party appeal was lodged against the Council's decision which was then withdrawn.

- Brookfield and Ashwood Hall Developments (Reg. Ref. F13A/0459 - PLO6F.243863 - Reg. Ref. F13A/0459/E1 & Reg. Ref. F13A/0460 - PLO6F.243821 - Reg. Ref. F13A/0460/E1) are currently under construction/ nearing completion.
- 89 dwellings under the live pre-application at Lamorlaye, Back Road
- F24A/0988E – 9 no. residential units proposed at Ashwood Hall and Brookfield
- Retail anchor development proposal on lands adjoining Ashwood Hall

Construction phase

The construction noise/vibration assessment in the previous sections represents the worst-case scenario's and it is very unlikely that the same noise/vibration event would happen to coincide at the same time of other potential developments giving rise to a theoretical increase in predicted noise levels. However, the impact of any predicted cumulative noise or vibration levels on nearby sensitive receptors is assumed not to exceed the worst-case scenario and is temporary, negative, and deemed not significant.

Operational phase

The anticipated noise impacts from the development during the operational phase will mainly be as a result of increased vehicle traffic flows along the incoming and outgoing routes into the proposed development site. It is anticipated that additional road traffic noise attributable to the overall masterplan will result in an increase in the baseline noise environment.

The change in noise levels and the significance of such changes can be categorised by the Guidelines for Noise Impact Assessment, Institute of Environmental Management and Assessment. Based on these guidelines the anticipated increase in noise levels can be categorised as 'Slight' at the worst case. The increase in traffic associated with the proposed development scheme together with other potential developments is therefore not expected to give rise to any significant noise nuisance in the area. We note that as part of the Government Climate Change action plan that petrol and diesel passenger vehicles are being phased out and potentially replaced by quieter electric vehicles eventually leading to less operational noise.

Traffic/transportation has been identified as the only likely source of vibration during the operational phase of the scheme. In the case of nominally continuous sources of vibration, such as traffic, vibration is perceptible at around 0.5 mm/s PPV and may become disturbing or annoying at higher magnitudes. There may, in theory, be a small increase (< 10%) in vibration levels as a result of increased traffic from the other potential developments, however, it would still be appropriate to assume that negligible vibration impacts will occur during the operation and no further assessment is deemed to be required. The cumulative noise / vibration impact is determined to be not significant.

9.7.4 Aircraft & railway noise.

As noted in section 9.3.6 that the site is exposed to both aircraft and railway noise and any effects of these on the proposed development are typically assessed under a Noise Impact Analysis Report and do not contribute to the proposed developments effect on the existing environment however this section covers a high level overview on the impacts.

Aircraft noise.

From illustration 9.7.1 the Fingall County Council linked day time aircraft noise map we note that the proposed development is in the L_{den} = 45 – 49dB zone and under the EPA Guide NG4 and Fingal County Council / Dublin Agglomeration 24-28 Noise Action Plan do not require further/any mitigation measures as a result of aircraft noise. From illustration 9.7.2 the Fingall County Council linked night time aircraft noise map we note that the proposed development is in the L_{night} = 40 – 45dB zone and under the EPA Guide NG4 and Fingal County Council / Dublin Agglomeration 24-28 Noise Action Plan

do not require further/any mitigation measures as a result of aircraft noise. We note that the noise survey data has not indicated any particular aircraft noise impacts.

Image 9.7.1 Fingal CC linked EPA aircraft noise map – Lden Day time 7.00 – 23.00 noise map

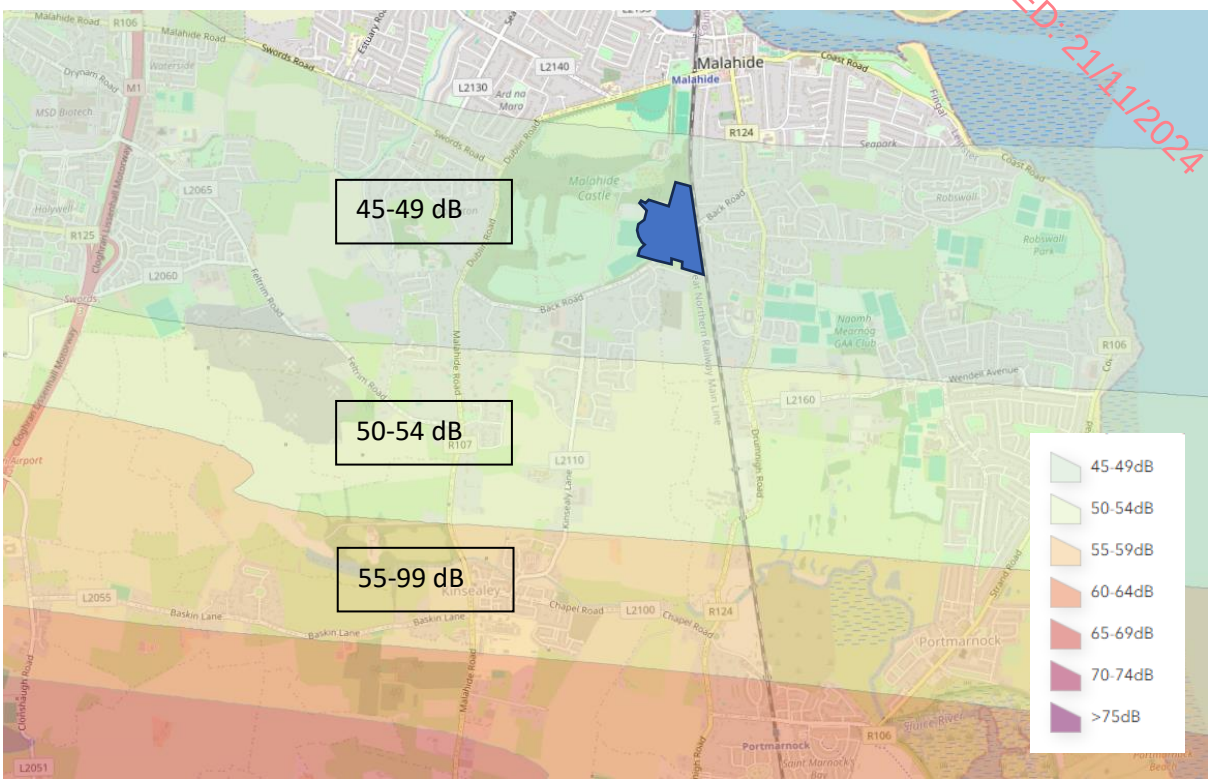


Image 9.7.2. Fingal CC linked EPA aircraft noise map – Lnight Night time 23.00 – 7.00 noise map

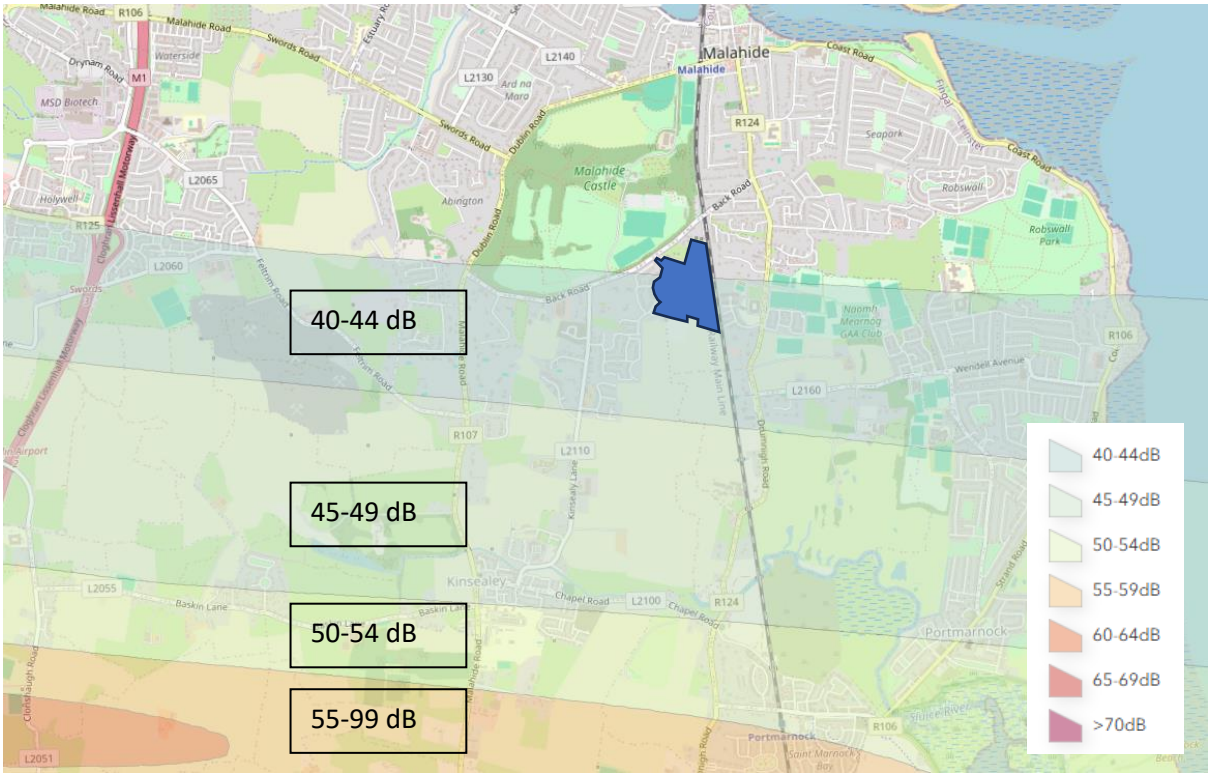


Image 9.7.3 EPA railway day time noise map – Lden Day time 7.00 – 23.00 noise map

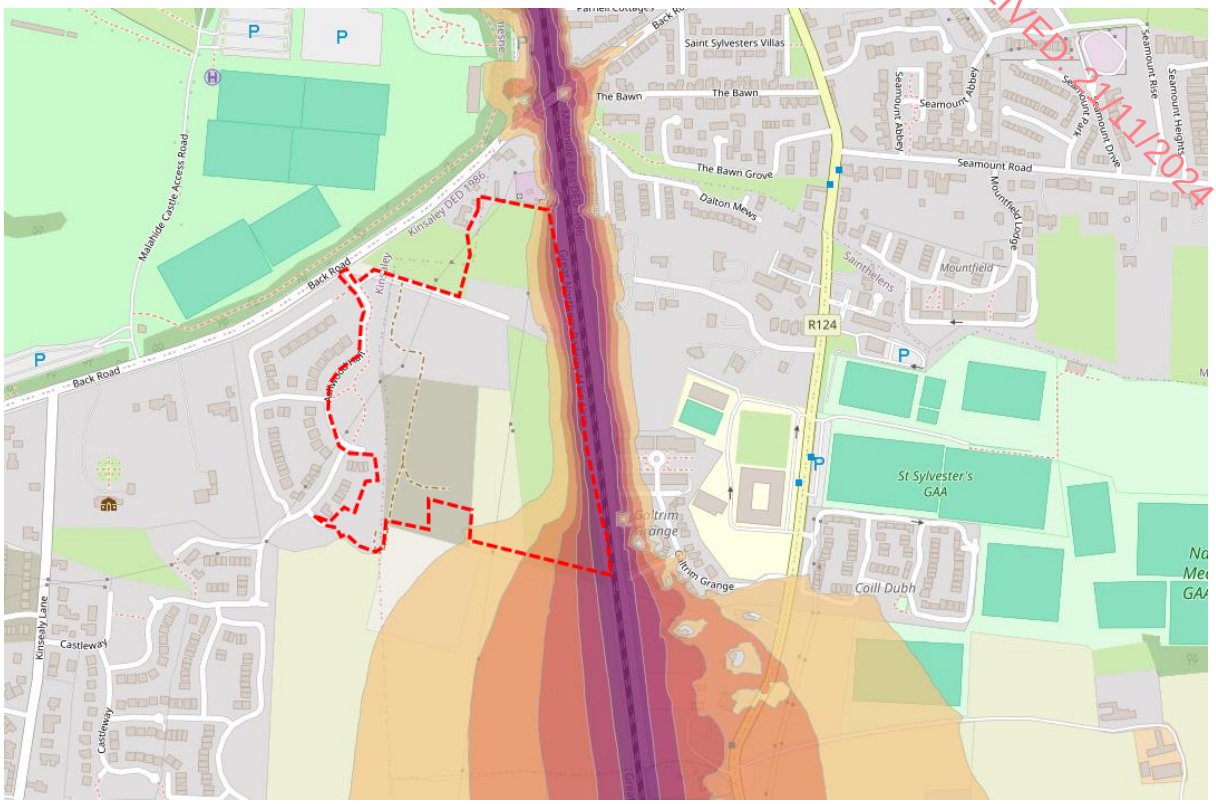
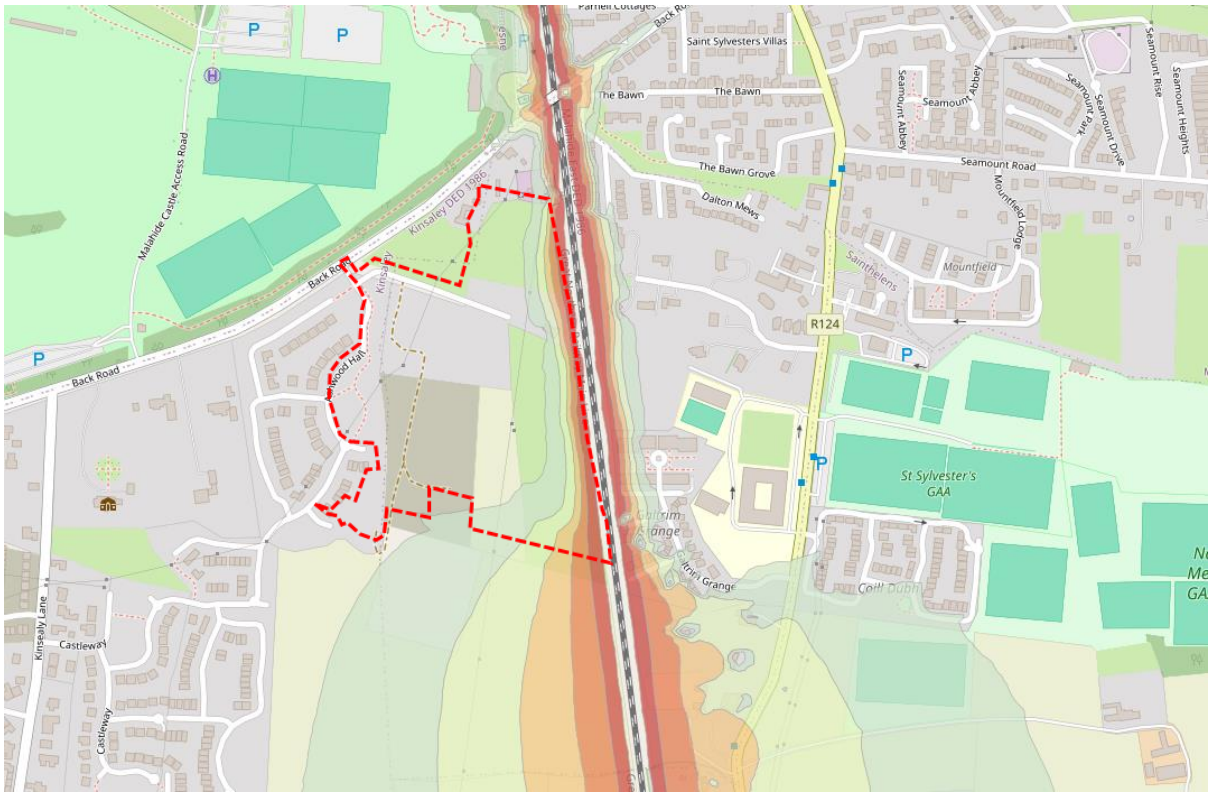


Image 9.7.4. EPA railway night time noise map – Lnight Night time 23.00 – 7.00 noise map



Railway noise.

From illustration 9.7.3 the EPA day time railway noise map and railway side noise survey point 3 we note that any dwellings to be constructed within 50m-60m of the railway line are more then likely to be exposed to noise levels in excess of the EPA NG4 maximum façade day time exposure of L_{den} 55dB and would require noise mitigation of some sort. From illustration 9.7.4 the EPA night time railway noise map and railway side noise survey point 3 we note that any dwellings to be constructed within 30m-40m of the railway line are more then likely to be exposed to noise levels in excess of the EPA NG4 maximum façade night time exposure of 45dB and would require noise mitigation of some sort.

Any aircraft or railway noise impacts on the development and subsequent mitigation are not contributory to the proposed sites impact on the existing noise environment under EIAR screening however the abovementioned noise impact and or any mitigation would normally assessed using a noise impact statement or report be it at planning application stage, under RFI or before commencement notice.