9.0 Flora and Fauna

9.1 Introduction

Scott Cawley Ltd. was commissioned to undertake an ecological impact appraisal (including biodiversity) of the proposed development of the National Maternity Hospital at St. Vincent's University Hospital Campus in Dublin 4 (see Figure 9.1 below for location of survey area, which encompasses the proposed development site). The aims of this ecological impact appraisal are to:

- Establish baseline ecological data for the proposed development site;
- Determine the ecological value of the identified ecological features;
- Appraise the impact of the proposed development on ecological features of value (flora and fauna);
- Propose effective mitigation measures to avoid, reduce, remedy or compensate impacts; and,
- Identify any residual impacts predicted to arise after mitigation.

Figure 9.1: Approximate location of survey area, which encompasses proposed development at lands in St. Vincent's University Hospital Campus, Dublin 4.

Source reference: Orthophotograph from ArcGIS World Imagery © Esri. Sources: Esri, Digital Globe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

The proposed development comprises the development of the National Maternity Hospital at St. Vincent's University Hospital Campus, Elm Park, Dublin 4. The proposed new National

Maternity Hospital building will be located at the eastern side of the hospital campus and comprises the construction of a building that rises to 5 and 6 storeys above ground level, with one partial basement level, plus additional ancillary plant areas at the roof level. The proposed development also includes the expansion of the existing multi-storey car park at the north of the Campus to accommodate the additional parking demand associated with the National Maternity Hospital and the re-provision of existing campus spaces that are displaced due to the works. The proposed development will be constructed in a sequential manner that allows for the continual operation of the hospital campus and, as such, includes the phased demolition of existing buildings at St. Vincent's University Hospital Campus to facilitate clearing the site for the proposed development, the construction of temporary accommodation to facilitate construction sequencing (including a single storey temporary canteen, catering staff changing facilities, household services store and carpenters workshop) and the relocation of essential infrastructure and equipment. The full detail of the nature and extent of the proposed development is set out in Chapter 2 of this EIA Report and the Draft Construction Management Plan is appended to same.

9.2 Methodology

9.2.1 Relevant Legislation, Policy and Guidelines

The appraisal of the likely significant impacts of the proposed development on ecological receptors has considered legislation, policy documents, and guidelines outlined in Appendix 9.1 of this Report, where relevant.

9.2.2 Desk Study

In addition to those listed in the Reference Section, key resources included Ordnance Survey Ireland mapping[1] and rare/protected/threatened species and protected areas data held online by the National Parks and Wildlife Service[2] and the National Biodiversity Data Centre[3].

9.2.3 Consultation

A formal consultation letter was submitted by Scott Cawley to the Development Applications Unit of the Department of Arts, Heritage and the Gaeltacht by letter on the 12th November 2015 to request any information on the site not available on their online database. A response was received on 15th December 2015. All comments have been addressed in this

[1] Available online at http://www.osi.ie/Home.aspx. Accessed on the 27th January 2017.
[2] Available online at http://www.npws.ie/mapsanddata/. Accessed on the 27th January 2017.
[3] Available online at www.biodiversityireland.ie. Accessed on the 27th January 2017.

report.

9.2.4 Field Survey Methodology

9.2.4.1 Habitats and Flora Survey

The site and its environs were surveyed on the 15th September 2015, 12th November 2015 and 16th February 2017. Weather conditions during all visits were dry and overcast. All habitats were classified using the *Guide to Habitats in Ireland* (Fossitt, 2000), recording dominant species, indicator species and/or species of conservation interest; with the Fossitt category codes given in parenthesis plant nomenclature follows the *New Flora of the British Isles – Third Edition (Stace, 2010)*.

9.2.4.2 Fauna Survey

Fauna were surveyed through the detection of field signs such as tracks, markings, feeding signs, and droppings, as well as by direct observation. The habitats on site were assessed for signs of usage by protected/red-listed fauna species, and potential to hold these species.
Bat surveys were conducted at the site having regard to the following guidelines:

- *Bat Surveys: Good Practice Guidelines (Bat Conservation Trust, 2016).*
- *Bat Surveys: Good Practice Guidelines (Bat Conservation Trust (UK), 2012)*
- *Bat Mitigation Guidelines for Ireland (National Parks and Wildlife Service, 2006)*
- *Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes (National Roads Authority, 2006a)*
- *Design Manual for Roads and Bridges: Nature Conservation Advice in Relation to Bats (Highways Agency, 2001)*

An original daytime external visual assessment of the buildings located within the proposed development site for the presence of bats was undertaken 10th September 2014 using a high-powered torch beam and an Explorer Premium Digital Endoscope Camera, where appropriate. The assessment involved the examination of the external areas of each building, where accessible, for signs of bat activity and potential features that may be utilised by bats. All open buildings were also checked internally for signs of bats. The buildings were not considered suitable for roosting bats. There were no attic spaces present and limited to no roof structures suitable for roosting bats.

Trees located across the proposed development site were also examined from ground level as potential bat roosts using an endoscope where necessary. They were assessed based on

the presence of features commonly used by bats. Examples of such features include:

- Natural holes;
- Woodpecker holes;
- Cracks/splits in major limbs;
- Loose bark; and,
- Hollows/cavities.

Trees were categorised according to the UK Bat Conservation Trust (2012) criteria described in Table 9.1 below.

Table 9.1: Assessing the value of tress to bats

Tree Category	Description
Category 1*	Trees with multiple, highly suitable features capable of supporting larger roosts
Category 1	Trees with definite bat potential, supporting fewer suitable features that category 1* trees or with potential for use by single bats.
Category 2	Trees with no obvious potential, although the tree is of a size and age that elevated surveys may result in cracks or crevices being found; or the tree supports some features which may have limited potential to support bats.
Category 3	Trees with no potential to support bats.

Source: Hundt, 2012

Dusk and dawn bat activity surveys were carried out by a Brian Keeley (B.Sc. (Hons) in Zool. MCIEEM) on the 10th-11th September 2014 respectively. See Table 9.2 below for information on survey times and weather conditions.

Table 9.2: Survey Times and Weather Conditions

Dates	Dusk Survey Times (sunset)	Dawn Survey Times (Sunrise)	Weather Conditions
10th September 2014	19:30 – 21:30 (19:53)	-	Mild, dry, cloudy
11th September 2014	-	05:30 – 07:00 (06:51)	Mild, dry, cloudy

The surveyor used a Pettersson Ultrasound Detector D 240x with time expansion capability and an Echo Meter 3 (Wildlife Acoustics EM3+). The aims of both surveys were to identify any bat activity within or directly adjacent to the proposed development site, to identify bat species present and to count the number of individuals identified. During both surveys, the surveyor walked the grounds of the proposed development site repeatedly. The survey effort was especially focussed on the buildings that are proposed for demolition. No bat activity

was noted within or directly adjacent to these buildings.

A static bat detector (Titley Anabat SD1 frequency division detector) was set to record bat calls from the 10th-11th September 2014. It was initially placed within the centre of the buildings and then moved at approximately 21:10 to a treeline located *c.* 135m south-west of the proposed development site. Data collected on the Anabat were then analysed using AnalookW Version 3.3q.

On the 15th September 2015 and 12th November 2015, another series of daytime visual walkovers were undertaken to establish if there were any significant changes to the proposed development area since the initial bat survey was undertaken in 2014. Another static bat detector (Anabat SD1 FD Bat Detector) was also set to record bat calls within the proposed development site from the 5th-12th November 2015, from approximately 18:00 to 07:30. It was placed on top of a container located in the centre of the proposed development site. Data collected on the Anabat were then analysed using AnalookW Version 3.3q.

9.2.5 Ecological Evaluation and Impact Assessment Methodology

9.2.5.1 Site Evaluation Criteria

The criteria used to assess the ecological value (Appendix 9.2) and significance of habitats follows *Guidelines for assessment of Ecological Impacts of National Road Schemes* (National Roads Authority, 2009) and is consistent with *Guidelines for Ecological Impact Assessment (CIEEM, 2016)*.

9.2.5.2 Impact Assessment Criteria

In accordance with *National Roads Authority Guidelines* (2009), impact assessment is only undertaken of '*key ecological receptors*'. Key ecological receptors are within the zone of influence[4] of the development and are '*both of sufficient value to be material in decision making and likely to be affected significantly*'. To qualify as key ecological receptors, features must be of local ecological importance (higher value) or higher as per the criteria in Appendix 9.2. Features of lower ecological value are not assessed. The highest levels of impact significance for each key ecological receptor 'value' rating are shown in Table 9.3.

[4] In accordance with National Roads Authority (2009) guidelines, the Zone of Influence is an important term to define the receiving environment for the activities associated with the project and the biophysical changes that are likely to occur. The Zone of Influence is the 'effect area' over which change is likely to occur. This differs for different species and habitats due to varying sensitivities to potential impacts.

Table 9.3: Maximum level of impact significance for Sensitive Ecological Receptors

Sensitive Ecological Receptor 'value' rating	Highest possible significance level
International Importance	Significant Positive/ Negative impact at International level
National Importance	Significant Positive/ Negative impact at National level
County Importance	Significant Positive/ Negative impact at County level
Local Importance (higher value)	Significant Positive/ Negative impact at Local level

9.2.5.3 Limitations/ Data Deficiencies

Due to the time of year when the appraisal took place, it was not possible to complete a comprehensive series of breeding bird surveys within the proposed development site. This deficiency is considered unlikely to limit the findings of the assessment of potential impacts on birds due to the lack of suitable breeding bird habitat within the proposed development site (i.e. a few planted scattered trees and ornamental shrubs present amongst large areas of hardstanding) and the existing high level of human disturbance. There is also significantly more suitable breeding bird habitat in the surrounding environment located outside of the proposed development site (in nearby residential gardens and Elm Park Golf Course). Signs of early breeding bird activity, if present within the site would have been captured during the site visit undertaken on the 16th February 2017 when it was known that birds had commenced breeding activity elsewhere.

The bat activity surveys were carried out in 2014 and 2015, and as such, usage of the site may have changed since these were undertaken. In order to ensure that these factors did not limit the findings of this assessment, a precautionary approach has been applied to the results of these surveys.

9.3 Receiving Environment

9.3.1 Site Overview

The proposed development site is located within the existing St. Vincent's University Hospital Campus south of Merrion Road in Dublin 4 (approximate centroid grid reference: O 19251 31071). It is almost entirely dominated by areas of hardstanding and buildings, which are associated with the existing St. Vincent's University Hospital Campus. There are also some areas of amenity grassland, scattered trees and parkland and planted ornamental shrubs. The area beyond this, to the north, west and east of the proposed development site, is urban in character and consists primarily of residential properties with associated gardens and commercial properties. Elm Park Golf and Sports Club is located directly to the south. The

railway line is located *c.* 200m north-east of the proposed development site. The Elm Park stream is located *c.* 360m south-east of the proposed development site.

9.3.2 Protected Areas

Information in relation to European sites is being provided so as to enable the Board, as competent authority, to conduct a comprehensive environmental assessment of all potential impacts on biodiversity, and without prejudice to the separate and distinct assessments which the Board is required to conduct under the Habitats Directive and Part XAB of the Planning and Development Act 2000, as amended (the information in respect of which assessments is provided in the Natura Impact Statement submitted with this application for permission).

European sites include Special Areas of Conservation (SAC) which are designated under the EC Habitats Directive (92/43/EEC), as amended, which is transposed into Irish law for the purposes of this application for permission by the provisions of Pat XAB of the Planning and Development Act 2000, as inserted. The legislation enables the protection of certain habitats (listed on Annex I of the Directive) and/or species (listed on Annex II). At present all SACs in Ireland are currently 'candidate' SACs, and referred to as such [cSACs]. The relevant statutory instruments formally designating SACs in Ireland have not yet been made, however, these "candidate" sites must still be afforded the same level of protection as if they were SACs in accordance with the Habitats Directive. European sites also include Special Protection Areas (SPAs) are designated under the Birds Directive (2009/147/EC). This allows for the protection of protected bird species listed on Annex I of the Directive, regularly occurring populations of migratory species (such as ducks, geese or waders), and areas of international importance for migratory birds.

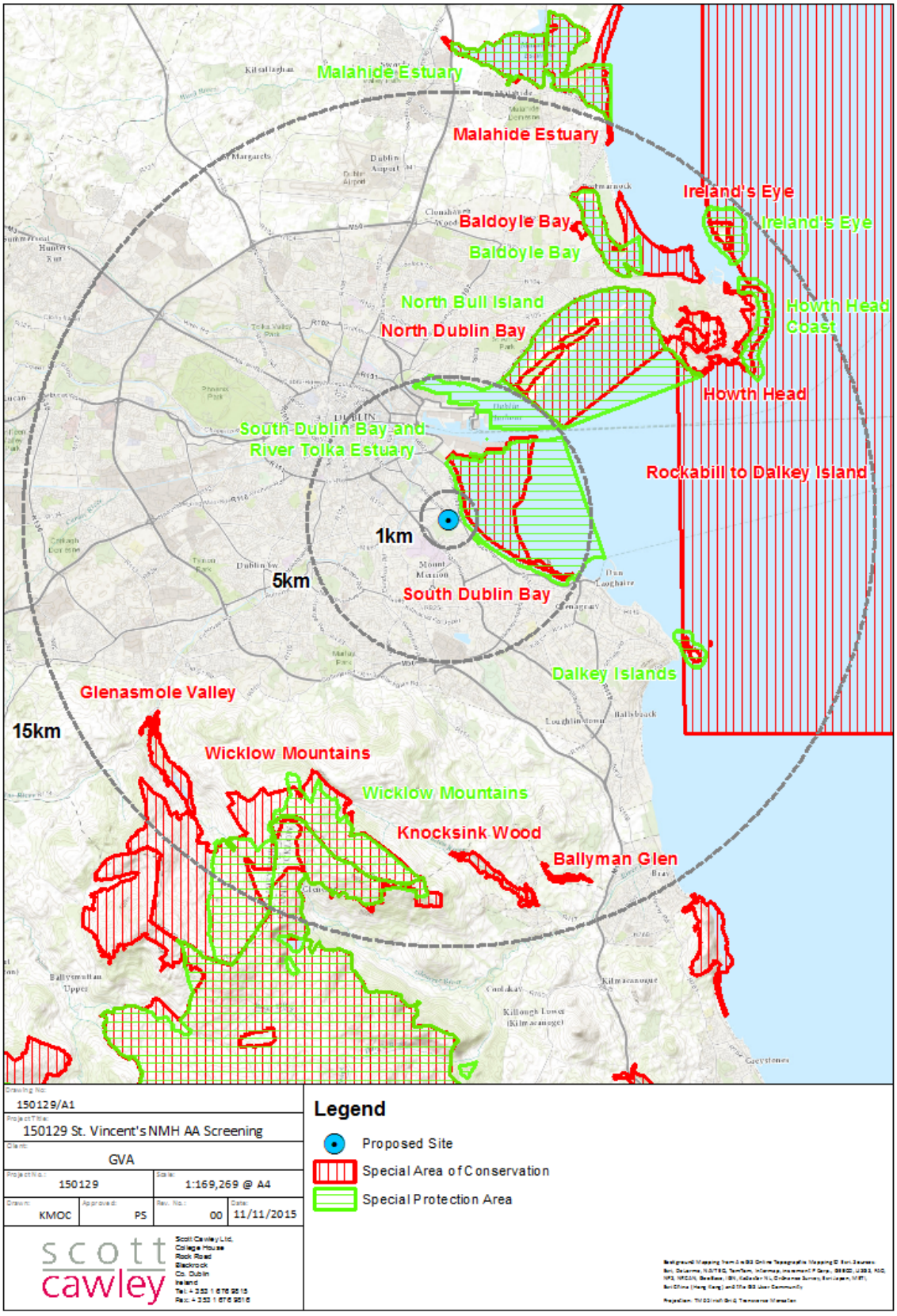
National Heritage Areas (NHAs) are designations under the Wildlife Acts in order to protect habitats, species or geology of national importance. The boundaries of many of the NHAs in Ireland overlap with European sites. Although many NHA designations are not yet fully in force under this legislation (referred to as 'proposed NHAs' or pNHAs), they are offered protection in the meantime under planning legislation which requires that planning authorities give due regard to their protection in planning policies and decisions.[5]

The proposed development site does not comprise any protected areas. There are 18 European sites (which include, inter alia, both SPAs and cSACs) located within 15km of the proposed development site. The closest of which are South Dublin Bay cSAC (000210) and

[5] Source: National Parks and Wildlife Service Website. Available online at http://www.npws.ie/protectedsites/naturalheritageareasnha/. Accessed 27th January 2017.

South Dublin Bay and River Tolka SPA (004024), both located *c.* 380m east of the proposed development site. Appendix 9.3 presents further information on these protected areas and their qualifying interests, along with a list of other protected areas located within 15km of the proposed development. Figure 9.2 presents a map of protected areas located within 15km of the proposed development site.

Figure 9.2: European sites within 1, 5 and 15 km of the proposed development

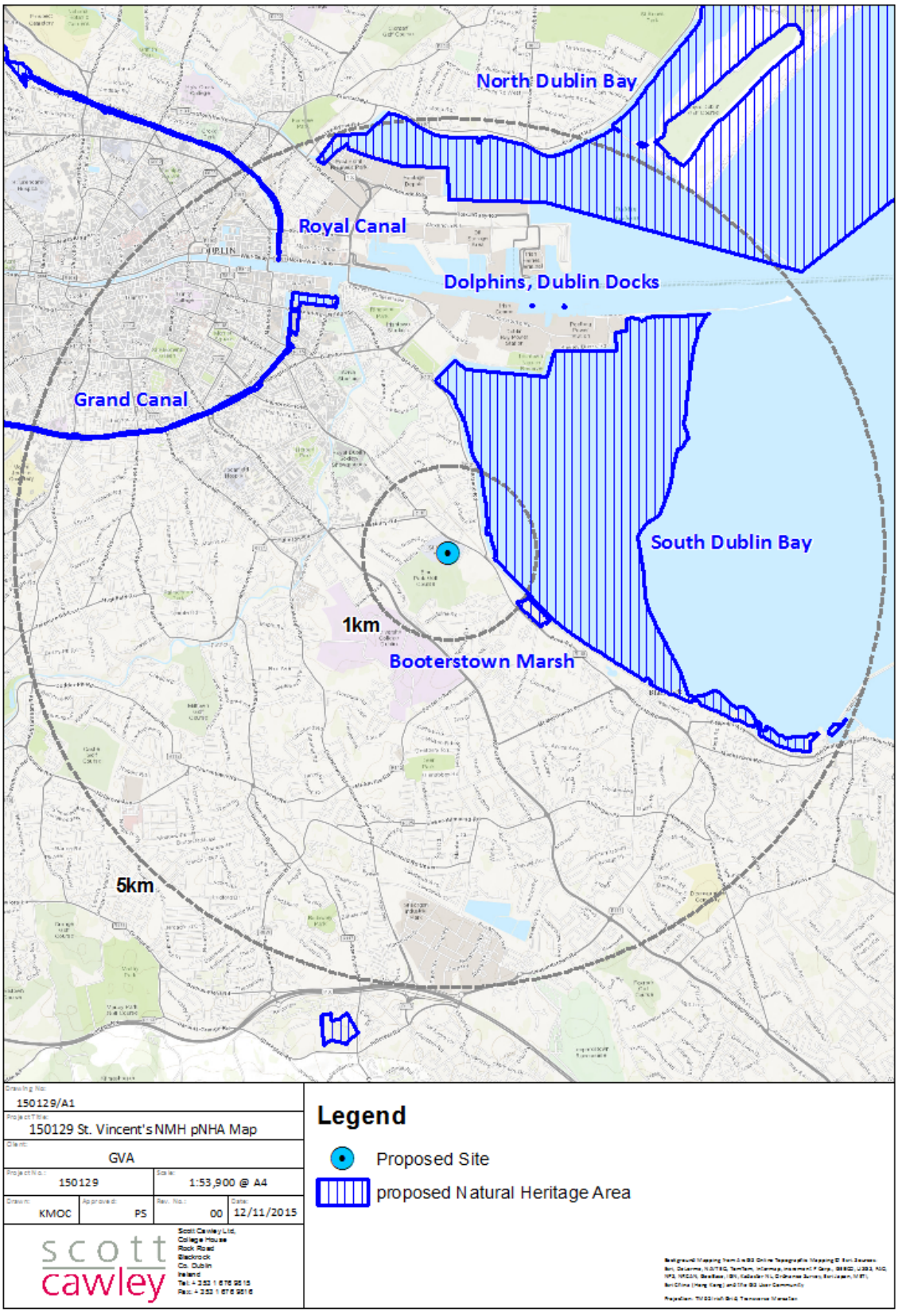


There are six proposed Natural Heritage Areas (pNHAs) located within the 5km zone of influence of the proposed development site. The closest of which is South Dublin Bay pNHA (000210), located *c.* 410m west. Figure 9.3 presents a map of pNHAs located within 5km of the proposed development site. The zone of influence of the proposed development in terms of its potential impact on pNHAs was regarded to be relatively limited (i.e. less than 5km from the perimeter).

The Elm Park stream is located *c.* 360m south-east of the proposed development site. It flows eastwards for *c.* 400m downstream of the proposed development site until it reaches Dublin Bay at Merrion Strand. The water quality of this stream is currently unknown.

As a separate but parallel process, and as set out in detail in the Natura Impact Statement submitted with the application for permission, the proposed development is considered to require a Stage Two Appropriate Assessment under Article 6(3) of the the Habitats Directive and Part XAB of the Planning and Development Act 2000, as amended as it was not possible to rule out significant effects on South Dublin Bay cSAC (000210), South Dublin Bay and River Tolka SPA (004024), North Dublin Bay cSAC (000206) and North Bull Island SPA (004006) at the Stage One Screening stage. In order to enable the Board to carry out its Stage One and Stage Two assessments under Article 6(3) of the Habitats Directive and sections 177U and 177V of the Planning and Development Act 2000, respectively, the NIS includes detailed information, including in relation to mitigation measures for consideration as part of the Stage Two Appropriate Assessment, which demonstrates that the proposed development will not give rise to any adverse effects on the integrity of any European sites site. For the parallel Environmental Impact Assessment to be carried out by the Board, these measures are also set out at Section 9.6 below.

Figure 9.3: Proposed Natural Heritage Areas (pNHAs) within 5km of the proposed development



9.3.3 Records of Protected, and Red-Listed Flora and Fauna Species

No records of rare / protected species within 2km of the proposed development site were contained within the online National Parks and Wildlife Service database (extracted on the 27th January 2017). Records within 2km of the subject lands were also obtained from the online database of the National Biodiversity Centre at www.biodiversityireland.ie. The results are shown below in Appendix 9.4 and Appendix 9.5.

Bat roost records were obtained from Bat Conservation Ireland on the 27th January 2017 for the proposed development site and environs to a distance of *c.* 10km. There were 46 records of bat roosts within 10km of the proposed development site, the nearest of which was an unidentified bat species roost located *c.* 1.4km to the south-west of the proposed development site.

9.3.3.1 Likelihood of Occurrence of Protected Species within the Proposed Development site

Flora[6]

Tufted Salt-marsh Grass *Puccinellia fasciculata* typically occurs in muddy inlets and edges of saline pools and drains, while Meadow Barley *Hordeum secalinum* typically occurs in the upper parts of brackish marshes, primarily near to the sea. Small Cudweed *Filago minima* occurs in sandy and gravelly places that are thinly vegetated. Great Burnet *Sanguisorba officinalis* is known to occur on lake-shores and dry banks. None of these habitats occur within or directly adjacent to the proposed development site and as such it is considered to be very unlikely that these rare species would occur within the proposed development site.

Fauna

There is very low potential for any of the mammal, amphibian and bird fauna listed in Appendix 9.5 to occur within the proposed development site. The unlikely potential occurrence of all species is elaborated upon in the field survey results section, and potential impacts and mitigation subsequently addressed, as relevant.

[6] Habitat Preferences and distribution data from Parnell & Curtis (2012), Wyse Jackson et al. (2016), Doogue et al. (1998) and the online atlas of the British and Irish Flora https://www.brc.ac.uk/plantatlas/ Accessed 27th January 2017.

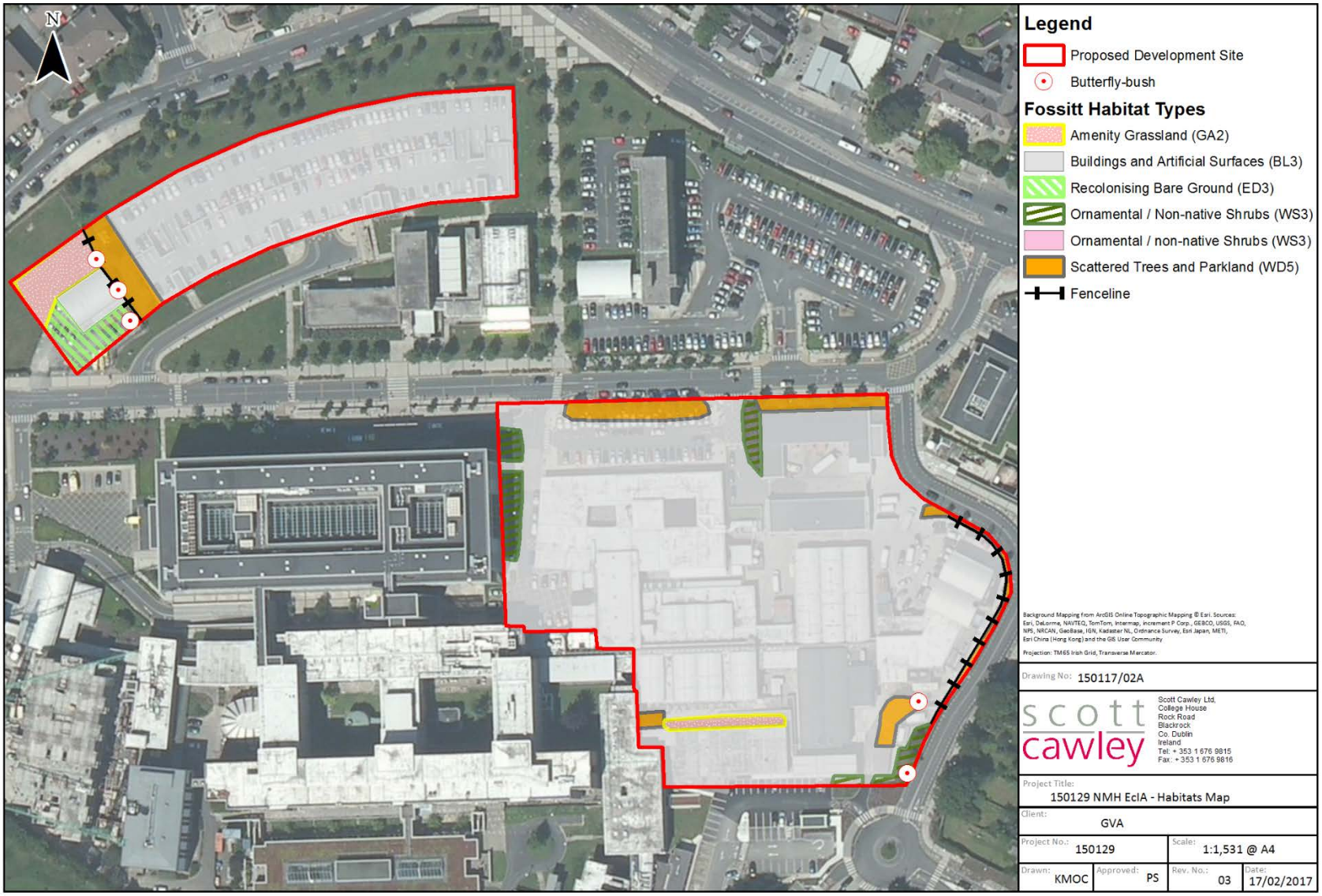
9.3.4 Field Survey Results

9.3.4.1 Habitat and Flora Survey

The following habitat types (codes indicate Fossitt 2000) were identified within the proposed development site (Figure 9.4 presents a map of habitats).

- Amenity grassland (GA2);
- Scattered trees and parkland (WD5);
- Buildings and artificial surfaces (BL3);
- Ornamental/non-native shrub (WS3); and,
- Recolonising bare ground (ED3).

Figure 9.4: Map showing the habitat types identified within the proposed development building area.



Amenity grassland (GA2)

Small patches of this habitat type are located across the proposed development site, adjacent to scattered trees and parkland habitats. Dominant and frequently-occurring species present include annual meadow-grass (*Poa annua*), Perennial rye-grass *Lolium perenne*, white clover *Trifolium repens*, creeping buttercup *Ranunculus repens* and daisy *Bellis perennis*.

Scattered Trees and Parkland (WD5)

There are a few patches of this habitat type located within and immediately adjacent to the proposed development site (Plate 9.1 below). Planted tree species identified are dominated by ornamental non-native maple *Acer* species. Other tree species present include ornamental pine *Pinus* species and Leyland cypress *Cupressus x leylandii*.

Plate 9.1: Scattered Trees and Parkland habitat type identified within the proposed development site. Photograph taken facing an easterly direction.

Ornamental / Non-native Shrubs (WS3)

There are small patches of this habitat type located across the proposed development site. Dominant species present include wall cotoneaster *Cotoneaster horizontalis* species. Other species present include willow-leaved cotoneaster *C. salicifolius* and *Escallonia macrantha*.

Buildings and Artificial Surfaces (BL3)

The majority of the proposed development site consists of this habitat type. It is comprised of various buildings (including multi-storey car park, St. Vincent's University Hospital Dermatology Unit and staff canteen), surface car park, access roads, footpaths and yards associated with these buildings (Plate 9.2). There are also a number of support buildings within the eastern section of the proposed development site, which provide energy, catering, delivery, facilitates management and waste management support to the St. Vincent's University Hospital Campus. There is very limited plant cover across this habitat type.

Plate 9.2: Surface car park with footpaths and access road (examples of habitat type Buildings and Artificial Surfaces BL3), located in the northern section of the proposed development site. Photograph taken facing a north-easterly direction.

Recolonising Bare Ground (ED3)

There is a small patch of this habitat type located within the western section of the proposed development site adjacent to an existing building and area of amenity grassland habitat. Dominant species present include those typical of disturbed ground such as fern-grass *Catapodium rigidum*, lesser trefoil *Trifolium dubium* and dandelion *Taraxacum officinale* agg. Other occasionally occurring species present include perennial rye-grass *Lolium perenne*, herb Robert *Geranium robertianum* and young saplings of butterfly-bush *Buddleja davidii.*

9.3.4.2 Notable Rare Flora

No protected, Red Data Book (Wyse Jackson et al., 2016) or rare flora species were recorded.

9.3.4.3 Invasive Flora

The invasive species wall cotoneaster was recorded within the proposed development site as a planted ornamental shrub. Young saplings of the invasive species butterfly-bush were recorded within the western section of the proposed development site in the area of recolonising bare ground habitat and in the eastern section of the proposed development site directly adjacent to a small patch of scattered trees and parkland. Both these species are on the '*amber list*' of recorded invasive species in Ireland[7].

9.3.4.4 Fauna Survey Results

Mammals (Bats)

Building Inspections

No evidence of bat activity was noted at any of the buildings located within the proposed development site. There are limited suitable roosting opportunities for bats within the existing structures. Many of the buildings also have potential sources of ultrasonic emissions that would be disturbing to bats.

Dusk and Dawn Bat Survey Results (2014)

Bat activity was only recorded along the treeline located *c.* 135m south of the proposed development site along the southern periphery of the St. Vincent's University Hospital Campus. No bats were recorded near any of the buildings within the proposed development site. The first bat recorded (at 21:12) was identified as a common pipistrelle bat *Pipistrellus pipistrellus*. This species was recorded on 11 occasions until 21:42. Only one bat was recorded during the dawn survey – a common pipistrelle bat at 05:58 (Keely, 2014). See Appendix 9.7 for full report.

Tree Inspections

All trees located across the proposed development site were classified as Category 3[8], as they did not contain features suitable for bat to roost in.

Mammals (Other)

No mammals or evidence of mammals were noted over the course of the survey. There was limited suitable habitat for mammals within the proposed development site.

[7] According to the Invasive Species Ireland website. Accessed at http://invasivespeciesireland.com/ on the 16th February 2017.
[8] Category 3 trees, as defined by Hundt (2012), are trees with no potential to support bats.

Amphibians and Reptiles

There were no suitable breeding and hibernating habitat for amphibians (common frogs *Rana temporaria* and smooth newts *Lissotriton vulgaris*) present within the proposed development site. No common lizards (*Lacerta vivipara)* were noted during the survey.

Birds

There is limited suitable habitat for breeding birds within the proposed development site; however during the site visit of the 12th November 2015, an abandoned nest was noted in a tree located immediately north of the proposed development site. During the site visit of the 16th February 2017, four bird species were identified within the proposed development. These included hooded crow *Corvus cornix*, pied wagtail *Motacilla alba*, magpie *Pica pica* and blackbird *Turdus merula*, all of which are listed on the green list of the Birds of Conservation Concern in Ireland (Colhoun & Cummings 2013). These birds were observed flying over, walking within and/or perched within the proposed development site.

9.3.5 Summary of Ecological Evaluation

Table 9.4 summarises all identified key ecological receptors. Key ecological receptors have been identified as at risk of potentially significant impacts via a source-pathway-receptor link. Key ecological receptors are valued as being of local ecological importance (higher value) or above per the criteria set out in Appendix 9.2.

Table 9.4: Ecological Evaluation of Key Ecological Receptors (Highlighted in grey)

Habitat/ Species	Highest Value Ecological Valuation Level	Key Ecological Receptor?
Protected Areas		
European Sites	International	Yes
Protected Areas	National-International	Yes
Protected Species		
Potential Roosting/Foraging/Commuting Bats	Local (High)	Yes
Nesting Birds	Local (Low)	No
Habitats and Flora		
BL3 Buildings and Artificial Surfaces	Local (Low)	No
GA2 Amenity Grassland	Local (Low)	No
WD5 Scattered Trees and Parkland	Local (Low)	No
WS3 Ornamental/Non-native Shrubs	Local (Low)	No

9.4 Characteristics of the Proposed Development

Full details of the proposed development are provided in the planning documentation. In brief, the proposed development will involve:

- The demolition of a number existing buildings within the proposed development site;
- The construction of the new maternity hospital building which will consist of a 5-storey and 6-storey block with one partial basement level with additional area of ancillary plant on the roof. A series of links and connections will be provided between the proposed development and the existing St. Vincent's University Hospital buildings;
- The provision of an additional 277 car parking spaces on the campus, which will include the expansion of the existing St. Vincent's University Hospital multi-storey car park;
- The relocation of essential infrastructure and equipment;
- The construction of temporary buildings including; a single storey catering staff changing facilities, a single storey household services store, a single storey carpenters' workshop and a single storey temporary canteen and access corridor;
- Landscaping works, which will include the creation of extensive and semi-intensive green roofs; and
- Excavation and disposal of made ground material from all construction areas to appropriate licenced facilities.

At present, foul effluent generated from the St. Vincent's University Hospital Campus discharges via existing outfalls, located on Merrion Road and Nutley Lane, to the public sewerage system. A new foul drainage system will be provided for as part of the proposed development. This new system will utilise the three existing outfalls located within the St. Vincent's University Hospital Campus and will also accommodate diversions of the existing network. It will be connected to the existing public combined sewer located on Merrion Road. From there, it will be transferred to Ringsend Wastewater Treatment Works for treatment prior to discharge into Dublin Bay. The population equivalent of the foul sewage from the proposed development is estimated to be 860 P.E.

At present, surface water run-off generated from the St. Vincent's University Hospital Campus discharges to the existing public surface water sewerage system on the Merrion Road. Surface runoff discharges from the western section of the Campus are controlled via a flow restricting device and attenuation tank located in the multi-storey car park, while discharges from the eastern side are unrestricted without any attenuation or flow control.

Surface water generated from the proposed development will be first transferred to two on-site attenuation tanks to be located in the service yard to the east of the development and at the pedestrian plaza at the main entrance to the north of the Hospital. It will then pass through a Class 1 petrol interceptor prior to discharge to the existing surface water sewer located on Merrion Road. Sustainable Urban Drainage Systems (SUDS) will be incorporated into the design of the proposed development and will include green roofs.

9.5 Potential Impact of the Proposed Development

As per the relevant guidelines, likely significant impacts have been assessed for key ecological receptors, as listed in the Table above. An impact is considered to be ecologically significant if it is predicted to affect the integrity or conservation status of a key ecological receptor at a specified geographical scale. All impacts are described, initially, in the absence of mitigation.

9.5.1 Construction Phase

9.5.1.1 Impacts on Fauna during Construction (Bats)

Bats were recorded *c.* 135m south, along the southern treeline boundary of the St. Vincent's University Hospital Campus adjacent to the Elm Park Golf Club. Temporary lighting required during the construction phase of the proposed development may contribute to the existing high light level at the proposed development site and as such may subsequently impact on bats commuting through, or feeding in lands located directly south of proposed development site. In the absence of mitigation, the potential impact of lighting during construction this is considered to be a temporary impact at the local geographic scale.

9.5.2 Operational Phase

9.5.2.1 Impacts on Fauna during Operation (Bats)

Bats were recorded *c.* 135m south, along the southern treeline boundary of the St. Vincent's University Hospital Campus adjacent to the Elm Park Golf Club. The proposed development may contribute to the existing high light level at the proposed development site and as such may subsequently impact on bats commuting through, or feeding in lands located directly south of proposed development site. In the absence of mitigation, the potential displacement impact of lighting during operation is considered to be a long-term significant

negative impact at local geographic scale.

9.5.3 Impacts on Protected Areas

Information in relation to European sites is being provided so as to enable the Board, as competent authority, to conduct a comprehensive environmental assessment of all potential impacts on biodiversity, and without prejudice to the separate and distinct assessments which the Board is required to conduct under the Habitats Directive and Part XAB of the Planning and Development Act 2000, as amended (the information in respect of which assessments is provided in the Natura Impact Statement submitted with this application for permission).

The information submitted to enable the Board, as competent authority, to conduct the assessments required under Article 6(3) of the EU Habitats Directive and Part XAB of the Planning and Development Act 2000, as amended, has been set out in the Natura Impact Statement which accompanies the application for permission. It was not possible to rule out significant effects on South Dublin Bay SAC (000210), South Dublin Bay and River Tolka SPA (004024), North Dublin Bay SAC (000206) and North Bull Island SPA (004006) which may arise from a potential contamination event occurring during the construction stage of the development. As a separate but parallel process to the preparation of this EIS, a Natura Impact Statement was prepared and includes detailed mitigation measures to ensure no adverse impacts on the site integrity will occur. Operational surface water will be adequately treated by the proposed Sustainable Urban Drainage System, including attenuation and Class 1 bypass separator. Foul water generated from the proposed development will discharge into the existing combined sewer network and transferred to Ringsend Wastewater Treatment Works for treatment.

Refer to the *Provision of Information for Appropriate Assessment Screening* and *Natura Impact Statement* Report for more information regarding the above.

9.6 Mitigation Measures

All of the ameliorative, remedial and reductive (mitigation) measures described in this section are proposed in accordance with current best practice guidance, as detailed in Appendix 9.1. Mitigation measures are proposed in relation to those receptors where the potential impact significance can further reduced by their effective implementation.

9.6.1.1 Mitigation during Construction – (Pollution Prevention)

Pollution Prevention

The construction contractor will be required to implement the following specific mitigation measures all of which are set out in the Outline Construction Management Plan, for release of hydrocarbons, polluting chemicals, sediment/silt and contaminated waters control:

- Specific measures to prevent the release of sediment to Dublin Bay during the construction work, which measures include, but are not limited to, the use of silt fences, silt curtains, settlement lagoons and filter materials. This is particularly important when undertaking any works/upgrading to the surface and foul water drainage networks at the proposed development site.

- Provision of exclusion zones and barriers (*e.g.* silt fences) between earthworks, stockpiles and temporary surfaces to prevent sediment washing into the existing drainage systems and hence the downstream receiving water environment.

- Provision of temporary construction surface drainage and sediment control measures to be in place before earthworks commence.

- Weather conditions will be taken into account when planning construction activities to minimise risk of run-off from the site.

- Prevailing weather and environmental conditions will be taken into account prior to the pouring of cementitious materials for the works adjacent to surface water drainage features, or drainage features connected to same. Pumped concrete will be monitored to ensure no accidental discharge. Mixer washings and excess concrete will not be discharged to existing surface water drainage systems. Concrete washout areas will be located remote from any surface water drainage features, where feasible, to avoid accidental discharge to watercourses.

- Any fuels or chemicals (including hydrocarbons or any polluting chemicals) will be stored in a bunded area to prevent any seepage of into the local surface water network or groundwater.

- All mobile fuel bowsers shall carry a skill kit and operatives must have spill response training. All fuel containing equipment such as portable generators shall be placed

on drip trays. All fuels and chemicals required to be stored on-site will be clearly marked.

- Implementation of response measures to potential pollution incidents.

- Emergency procedures and spillage kits will be available and construction staff will be familiar with emergency procedures in the event of accidental fuel spillages.

- All trucks will have a built-on tarpaulin that will cover excavated material as it is being hauled off-site and wheel wash facilities will be provided at all site egress points.

- A secant pile cut-off wall is the primary source of groundwater control during construction. Any seepage/infiltration through the vertical face of the wall, together with ingress at designated weephole locations, and surface ponding from rainfall events will be gathered locally to facilitate pumping with subsequent discharge, under licence, to the local sewerage drainage network. Prior to any discharge, the water will be passed through silt traps and hydrocarbon/oil interceptors within the construction site confines. This will result in the separation of sediment from the water prior to its discharge and will ensure that the water is of adequate quality before it enters the local authority drainage system. The use of silt traps and interceptors will be supplemented by control measures, such as regular testing and monitoring of water quality, to ensure compliance.

- The pumping of groundwater, which has risen up due to excavation works, will only be required during the deeper phases of excavation when the confining properties of the glacial till are overcome by groundwater pressures, with the proposed locations of pumpwells selected so as to minimise the volume of pumping. It is estimated that the required pumping rate will be low. The water will be pumped under a fully-enclosed system and it is thus envisaged that the water to be discharged will be clean groundwater. It is therefore proposed that the water be discharged via the existing storm drainage network under a discharge licence regulated by Dublin City Council. Qualitative and quantitative monitoring will be adopted to ensure that the water is of sufficient quality to discharge to the river. The use of silt traps will be adopted if the monitoring indicates the requirement for same with no silt or contaminated water permitted to discharge to the receiving water environment.

- Water supplies shall be recycled for use in the wheel wash. All waters shall be drained through appropriate filter material prior to discharge from the construction sites.

- The removal of any made ground material, which may be contaminated, from the construction site and transportation to an appropriate licenced facility shall be carried out in accordance with the Waste Management Act, best practice and guidelines for same.

- A discovery procedure for contaminated material will be implemented prior to excavation works commencing on site. These documents will detail how potentially contaminated material will be dealt with during the excavation phase.

- Implementation of measures to minimise waste and ensure correct handling, storage and disposal of waste (most notably wet concrete, pile arisings and asphalt).

9.6.1.2 Fauna

Measures to Reduce Impacts on Bats

Lighting proposals for this site will adhere to the advice provided in '*Bats and lighting – Guidance for Planners, engineers, architects and developers*' (Bat Conservation Ireland 2010). A construction lighting plan shall be reviewed by a qualified bat ecologist prior to installation. Any recommended adjustments to directional lighting (e.g. through retrofit of cowls, shields or louvres) made by the bat ecologist, in agreement with the local authority and the lighting designer, shall be implemented to ensure minimum light spill onto vegetated areas, and above lighting columns (reducing light spill to vegetated areas at the perimeter of the campus to below 1 lux where possible).

9.6.2 Operational Phase

9.6.2.1 Pollution Prevention

Pollution Prevention

The petrol interceptor(s) shall be regularly maintained and kept in properly working for the lifetime of the development.

9.6.3 Mitigation during Operation – (Fauna)

Measures to Reduce Impacts on Bats

Lighting proposals for this site will adhere to the advice provided in '*Bats and lighting – Guidance for Planners, engineers, architects and developers*' (Bat Conservation Ireland 2010). A lighting plan shall be reviewed by a qualified bat ecologist prior to installation. Any

recommended adjustments to directional lighting (e.g. through retrofit of cowls, shields or louvres) made by the bat ecologist, in agreement with the local authority and the lighting designer, shall be implemented to ensure minimum light spill onto vegetated areas, and above lighting columns (reducing light spill to vegetated areas at the perimeter of the campus to below 1 lux where possible).

The following is recommended in relation to the lighting design (Keely, 2014):

- No floodlighting should be used, which may cause a large amount of light spillage into the sky. The spread of light should be kept below the horizontal;
- Hoods, louvres, shields or cowls should be fitted on the lights to reduce light spillage;
- Lights should be of low intensity in perimeter areas where there is a higher risk of potential impacts on fauna. This should be balanced against the requirement for lighting levels to ensure a secure and safe public realm;
- Where compatible with the use of external areas, lights should be on a timer system to switch off relatively quickly in the absence of sustained movement; and,
- Narrow spectrum lighting should be used with a low UV component. Glass also helps to reduce the UV component emitted by lights.

9.7 Predicted Impact of the Proposed Development

Following implementation of mitigation measures, no significant residual impacts are anticipated either during the construction phase or the operational phase of the proposed development.

9.7.1 Construction Phase

Information in relation to European sites is being provided so as to enable the Board, as competent authority, to conduct a comprehensive environmental assessment of all potential impacts on biodiversity, and without prejudice to the separate and distinct assessments which the Board is required to conduct under the Habitats Directive and Part XAB of the Planning and Development Act 2000, as amended (the information in respect of which assessments is provided in the Natura Impact Statement submitted with this application for permission).

9.7.1.1 Predicted Impact on Protected Areas

Following implementation of the site specific mitigation measures, described in Section 9.6.1.1 of this Report and the Outline Construction Management Plan, there will be no risk of adverse effects on any of the European sites. This judgement is made in the context of the need to comply with Article 6(3) of the E.U. Habitats Directive and is described in more detail in the Natura Impact Statement.

9.7.1.2 Predicted Impact on Fauna (Bats)

Following implementation of the proposed mitigation measures, there will be no predicted significant impacts on bats during construction.

9.7.2 Operational Phase

9.7.2.1 Impacts on Fauna (Bats)

Following implementation of the proposed mitigation measures, there will be no predicted significant impacts on bats during operation.

9.7.3 Do-Nothing Scenario

The management of the existing site is expected to maintain the existing habitats types close to their current form. The site will continue to offer some limited suitable habitat to local populations of birds.

9.8 Monitoring

None is proposed.

9.9 Reinstatement

No reinstatement is deemed necessary in respect to the predicted impact.

9.10 Interactions and Potential Cumulative Impacts

9.10.1 Interactions

There are interactions between impacts on hydrology with respect to the potential impact of water pollution on protected areas and impacts on microclimate with respect to the potential impact of light pollution on bats during construction and operation without the

implementation of mitigation measures.

9.10.2 Potential Cumulative Impacts

According to *Dublin City Development Plan 2016 – 2022*, the proposed development site is and its environs are currently zoned as '*Zoned Z15: Institutional and Community*. Other surrounding lands are zoned as '*Zone Z9: Amenity/Open Space Lands/Green Network*' to the south, '*Zone Z1: Sustainable Residential Neighbourhoods' and 'Zone Z2: Residential Neighbourhoods (Conservation Areas)*' to the west, north and east and '*Zone Z4: District Zones (incorporating Key District Centres)*' to the north-west. Existing or proposed projects or plans (such as the Dublin City Development Plan 2016-2022) impacting on the same sensitive ecological receptors have the potential to lead to impacts of a higher level of significance when assessed cumulatively. A number of extant planning permissions for developments located within the vicinity of St. Vincent's University Hospital Campus, have been assessed in terms of the proposed development and the potential for cumulative impacts to arise (see Appendix 9.6 for a list of potential projects).

These existing, as well as proposed, projects or plans impacting on the same sensitive ecological receptors have the potential to lead to impacts of a higher level of significance when assessed cumulatively. One such relevant potential impact is the combined loss of suitable bat foraging and commuting habitats in the locality as a consequence of increased levels of light at night-time. In the absence of mitigation measures, this may potentially result in significant cumulative impacts. However, adherence to the proposed mitigation measures during both the construction and operational phase of the proposed development will ensure no potential for cumulative impacts to arise.

The risk of any cumulative impacts arising in relation to water quality are discussed above in Section 9.5.3 in the context of impacts on protected areas downstream of the proposed development. Impacts to protected areas are considered to be unlikely due to the legal requirement for all future plans and projects to undergo screening for Appropriate Assessment.

Information in relation to European sites is being provided so as to enable the Board, as competent authority, to conduct a comprehensive environmental assessment of all potential impacts on biodiversity, and without prejudice to the separate and distinct assessments which the Board is required to conduct under the Habitats Directive and Part XAB of the Planning and Development Act 2000, as amended (the information in respect of which assessments is provided in the Natura Impact Statement submitted with this application for permission).

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