Natura Impact Statement

Proposed Residential Development

Lahardane

Ballyvolane

Co. Cork

Final Report, prepared for Longview Estates Ltd

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1 Introduction

This Natura Impact Statement (NIS) provides information in support of the Appropriate Assessment (AA), undertaken by Greenleaf Ecology on behalf of Longview Estates Ltd, in respect of the proposed residential development at Lahardane, Ballyvolane, County Cork. This report provides information and appraises the potential that the proposed Residential Development, alone or in combination with other plans and projects, will have an adverse effect on the integrity of European sites in view of best scientific knowledge and the conservation objectives of the sites. European sites are those identified as sites of European Community importance designated as Special Areas of Conservation under the Habitats Directive (92/43/EEC) or as Special Protection Areas under the Birds Directive (79/409/ECC as codified by Directive 2009/147/EC).

1.1 Statement of Competence

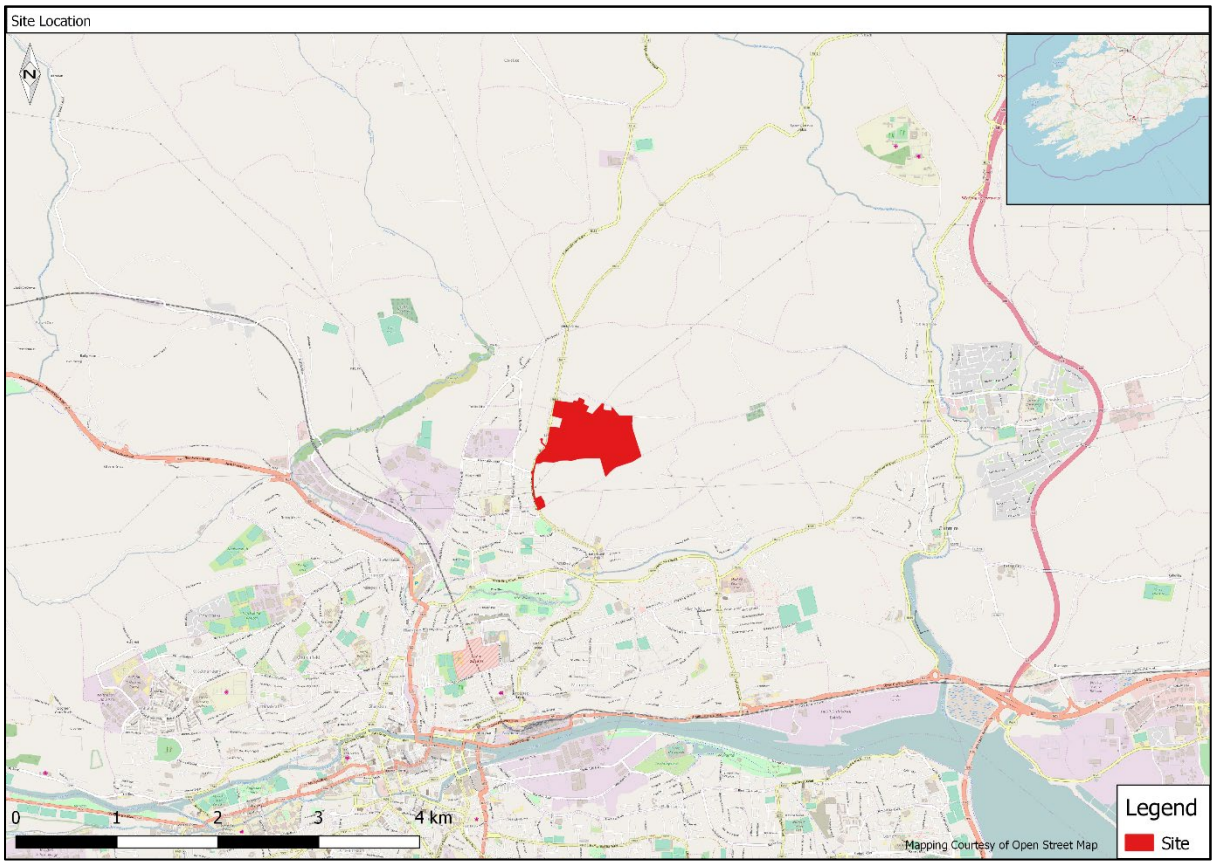
This NIS has been prepared by Karen Banks. Karen is an ecologist with 13 years' experience in the field of ecological assessment. She holds a BSc (Hons) in Environment and Development from Durham University, and is a full member of the Chartered Institute of Ecology and Environmental Management. Karen specialises in ecological field survey and impact assessment. In her career as an ecologist Karen has undertaken Appropriate Assessments (AA) covering the transport, energy and land use sectors, with work including assessment of Plans at the national, regional and local level; and numerous AAs of projects.

1.2 Background

The proposed development site is located within the area of the Cobh Municipal District Plan 2017. Within this Plan, the site is located in an area identified as the Cork City North Environs and forms part of a special policy area known as the Ballyvolane Urban Expansion Area. The Northern Environs was identified in the Cork Area Strategic Plan update (2008) as a significant growth location, with Ballyvolane identified as the primary location to accommodate additional growth.

The proposed residential development at Ballyvolane is described in **Section 1.3** of this report. The location of the proposed development is illustrated in **Figure 1-1**.

Figure 1-1: Site Location Map



1.3 Description of the Proposed Development

The proposed development will consist of a strategic housing development including 753 residential units to be constructed in a series of phases (six neighbourhoods in total), a local centre including retail (2 no. units), a crèche, doctors surgery and community use unit and all associated and ancillary infrastructure, services and site development works.

The proposed 753 no. residential units are comprised of the following:

- 67 no. detached houses including 31 no. 4 bedroom units and 36 no. 3 bedroom units
- 278 no semi-detached houses including 41 no. 4 bedroom units and 237 no. 3 bedroom units
- 186 no. terrace houses including 18 no. 4 bedroom units, 96 no. 3 bedroom units and 72 no. 2 bedroom units
- 69 no. duplexes including 36 no. 3 bedroom units and 33 no. 2 bedroom units
- 153 no. apartments including 6 no. studio apartments, 42 no. 1 bedroom apartments, 79 no. 2 bedroom apartments and 26 no. 3 bedroom apartments. Three apartment blocks will be provided (2 no. in Neighbourhood 6 and 1 no. in Neighbourhood 2)

The proposed development includes a number of open spaces and play areas in addition to general landscaping, boundary treatments (including walls and landscaping to the houses to the north) and lands to the east, and landscaped parkland / greenway. The proposal includes an internal distributor road providing access to neighbouring lands, associated internal roads, car parking, pedestrian and cycle paths (providing access to neighbouring

lands), public lighting, internal bus stops and turning area, bin storage (in apartment locations) and cycle parking and all site services infrastructure. The associated site and infrastructural works include water supply, foul and surface / storm water drainage infrastructure to local services and drains and 7 no. unit sub stations.

Two no. vehicular accesses are proposed from the Ballyhooly Road and one no. access to / from the local road to the north of the site (pedestrian access points will also be allowed to the local road to the north), all including local road widening within applicant lands, resurfacing and boundary works. Signalisation of the Lower Dublin Hill / Ballyhooly Road Junction is also proposed along with the provision of a new bus stop on the eastern side of the Ballyhooly Road close to the junction of Lower Dublin Hill and the Ballyhooly Road. The application also provides for the reservation of lands to accommodate the widening of the Ballyhooly Road and the provision of new pedestrian and cyclist infrastructure along the eastern side of the Ballyhooly Road with crossing of same close to Mervue Lawn south of the proposed development.

Groundworks, excavation and ground reprofiling are required and proposed to provide a Distributor Road through the site and all development areas internally within the site. The proposed development also provides for the line diversion and partial undergrounding of the Kilbarry-Flaxfort-Mayfield 38kv line that traverses the landholding east / west, the removal of existing pylons and the provision of two new pylons one in the Lahardane Townland and one in the Ballincolly Townland and landscaping works within the 110 kv power line wayleaves that also traverse the site.

1.3.1 Surface Water

The following features are proposed within the project design:

- The proposed road gradients, road levels, and dwelling finished floor levels (FFL) have been designed to ensure the concentration of surface water run-off in any one location is avoided.
- Each drainage area has been assessed independently of others in terms of allowable run-off rates. SuDS measures are proposed for each neighbourhood, which have not been included for in the sizing of the storm sewer network, reducing the discharge rate to below greenfield run-off rates (QBar). These proposed interception measures will ensure that the initial 5mm of rainfall is prevented from discharging to the storm network, thereby ensuring the water quality of the receiving watercourse to the west is preserved.
- Surface water runoff on the western side of the site will be attenuated to greenfield runoff rates (Qbar) as agreed with the Drainage Department of Cork City Council.
- SuDS measures in this location will include the use of permeable paving at traffic calmed junctions and the use of planted swales where possible along road edges to provide a primary cleaning of run-off before entering the storm network.
- Surface water discharge rates will be controlled by a Hydrobrake type vortex control device or similar approved, in conjunction with below ground Stormtech attenuation chamber storage, or similar approved.
- Surface water runoff to the eastern side of the site will be routed to buried Stormtech chambers for infiltration into the existing subsoil in-line with site investigation results. This will facilitate the recharge of aquifers in the area whilst limiting the run-off from the overall site to less than the current rate.
- A contract will be entered into with a suitably qualified contractor for the maintenance of the attenuation system including Hydro-brake and the installed hydrocarbon interceptors.

The following methodologies are being implemented as part of the SuDS surface water treatment approach:

- The use of on-site infiltration where feasible (eastern side of the scheme).
- Permeable Paving at suitable locations in and around the retail/crèche area.
- Permeable Paving to be used for junction treatments and tied into storm sewer network in all locations.
- Planted swales along access roads where practical (including tree-pits).
- Attenuation chambers sized to 30 and 100 year return period storms.
- Installation of Hydrobrake vortex control system (limiting surface water discharge from the site to Qbar (5 l/s/ha)).
- Fuel/oil separators will be sized and installed in accordance with permitted discharge from the site for the various phases.
- Attenuation storage design allows for 20% growth of rainfall intensity due to climate change.
- Green Roof attenuation storage provided for in Apartments in neighbourhood 6.

It is proposed to construct two surface water outfalls (Outfall 1 and Outfall 2) to the watercourse running on the western side of Ballyhooly Road. The majority of the site will discharge to Outfall 2, specifically located downstream of an existing culvert under the Kilbarry Link Road.

1.3.2 Foul Water Network

The construction of the foul sewer pipe network shall be in accordance with Irish Water Code of Practice for Wastewater Infrastructure Doc IW-CDS-5030-03.

The proposed development makes provision for two no. pumping stations (and connections to / from same), one in neighbourhood 5 and one adjacent to the Ballyhooly Road, with access, to serve this site and future lands as required by Irish Water. The foul water will be treated at the Carrigrenan WWTP, which has sufficient capacity for the proposed development.

The following indicates how the foul network will develop as the various phases are complete.

Phase 1: Foul network will be gravity fed and will connect to existing 225mm foul sewer running north to south on Ballyhooly Road.

Phase 2: A new strategic pump station is required along Ballyhooly Road to the south of the residential development. This station is required to accommodate additional phases and future developments in the Urban Expansion Area (UEA). The existing foul network has capacity for Phase 1 only. The applicant has entered into a Project Works Service Agreement (PWSA) with IW for the delivery of this infrastructure.

Phase 3: Additional foul network required for Phase 3 housing will be tied into development foul network and be gravity fed to new Irish Water pumping station.

Phase 4: Additional foul network required for Phase 4 housing will be tied into development foul network installed along Ballyhooly Road and be gravity fed to new Irish Water pumping station.

Phase 5: Due to topography constraints, wastewater from Phase 5 will need to be pumped in order to connect to the overall development foul network. A new pumping station will be constructed bordering Phase 5 to achieve this. The rising main from the pumping station will extend north along the main distributor road through the proposed development before tying into the overall development foul network at a location adjacent to Phase 2. Wastewater will then be gravity fed to the new Irish Water pumping station.

Phase 6: Additional foul network required for Phase 6 will be tied into development foul network and be gravity fed to new Irish Water pumping station.

Network extensions will be delivered by Irish Water to service this application and potentially adjacent lands under the provisions of the Water Services Act. These works will include rising mains from the proposed Ballyhooly Rd Pumping Station, south along the Ballyhooly Rd to the junction with the North Ring Road at which point it will be routed east along the North Ring Road to a termination point at the Old Youghal Rd Junction. The overall rising mains will include 2400 m of 150mm rising main from the Pumping Station to the Old Youghal Road Junction; a parallel length from the pumping station of 800 m of 250 mm diameter watermain to allow connection / network management by IW including potential connect to existing interceptor sewers; or further extension as required. The rising mains will be routed in public roads (an alternative route is possible in the Glen Park area for the section proposed for the North Ring Road). 250 mm diameter foul sewer connecting the housing scheme has been incorporated into the scheme drainage to connect to the Pumping Station proposed on Ballyhooly Road for all phases of housing delivery. This will also capture existing flows from the current 225 mm gravity foul to the north.

1.3.3 Flood Risk

A flood risk assessment for the proposed development has been undertaken (MHL, 2019). As part of the sequential test, the OPW flood hazard maps were consulted, as were the draft Preliminary Catchment Flood Risk Assessment Maps produced by the OPW. Other sources of flood risk were investigated including development drainage. In all cases it was found that the development is at low risk of flooding and the development is deemed appropriate in the proposed site location.

1.4 Study Area and Zone of Influence

The proposed residential development will comprise 753 no. residential units at Lahardane, Ballyvolane, Co. Cork.

Determination of this project's Zone of Influence (ZoI) was achieved by assessing all elements of the proposed project against the ecological receptors within the project footprint, in addition to all ecological receptors that could be connected to and subsequently impacted by the proposed project through impact pathways. To this end, the ZoI extends outside of the proposed residential development footprint to include ecological receptors connected to the project through overlap / intersection, proximity and connectivity through features such as watercourses.

The proposed residential development is not located within sites designated for nature conservation, however the project supports connectivity with two European sites; Great Island Channel Special Area of Conservation SAC (Site Code: 001058) and Cork Harbour SPA (Site Code: 004030) (See **Figure 3-1**)

Designated sites, habitats, flora and fauna protected under Irish statute are assessed in full in Chapter 10 of the accompanying EIAR.

1.5 Findings of Screening for Appropriate Assessment

A Screening for Appropriate Assessment report was completed for this project in 2019 (**Appendix A**). This assessment found that three European sites are present within 15km of the proposed site, including Cork Harbour SPA (Site Code: 004030) and Great Island Channel SAC (001058). At its closest point, Cork Harbour SPA is located 2.8km south-east (**Table 3-1**); the proposed residential development supports indirect connectivity to Cork Harbour SPA via field drains connecting to a watercourse outside the site boundary, which flows into the Ballincolly River. The Ballincolly River ultimately drains into Cork Harbour.

Given the size and scale of the proposed development and uncertainty regarding the potential effects of run-off of suspended solids and pollutants entering Cork Harbour, it was

deemed that the proposed Residential Development, Lahardane, could not be screened out for AA and that an NIS be completed to inform the AA. Great Island Channel SAC supports remote and tenuous connectivity with the proposed residential development, through the waters of Cork Harbour. Potential impacts to the Great Island Channel SAC are also considered as part of this NIS.

1.6 NIS Objectives

This NIS considers impacts to Cork Harbour SPA focusing on potential impacts such as the release of water borne pollutants to sensitive habitats and watercourses draining the proposed site which provide connectivity with Cork Harbour SPA and Great Island Channel SAC.

2 Methodology

2.1 Legislative Background for Appropriate Assessment

The Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora, better known as "The Habitats Directive", provides legal protection for habitats and species of European importance. Articles 3 to 9 provide the legislative means to protect habitats and species of Community interest through the establishment and conservation of an EU-wide network of sites known as Natura 2000. As defined under the Habitats Directive (Article 3(1)) Natura 2000 is a European ecological network composed of sites hosting the natural habitat types listed in Annex I and habitats of the species listed in Annex II, shall enable the natural habitat types and the species' habitats concerned to be maintained or, where appropriate, restored at a favourable conservation status in their natural range.

In Ireland, these sites are designated as European sites and include SPAs, established under the EU Birds Directive (79/409/EEC, as codified by 2009/147/EC) for birds and SACs, established under the Habitats Directive 92/43/EEC for habitats and species.

The Habitats Directive has been transposed into Irish law by Part XAB of the Planning and Development Act, 2000 - 2015 and the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477/2011) as amended.

Articles 6(3) and 6(4) of the Habitats Directive sets out the decision-making tests for plans and projects likely to have a significant effect on or to adversely affect the integrity of European sites. Article 6(3) establishes the requirement for Appropriate Assessment (AA):

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

Both EU and national guidance exists in relation to Member States fulfilling their requirements under the EU Habitats Directive, with particular reference to Article 6(3) and 6(4) of that Directive. The methodology followed in this report to inform the assessment has had regard to the following legislation and guidance listed in **Section 2.2**:

- Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (also known as the 'Habitats Directive');
- Council Directive 2009/147/EC on the conservation of wild birds, codified version, (also known as the 'Birds Directive');
- The European Communities (Birds and Natural Habitats) Regulations 2011 to 2015; and
- The Planning and Development Act 2000-2019.

2.2 Stages of Appropriate Assessment

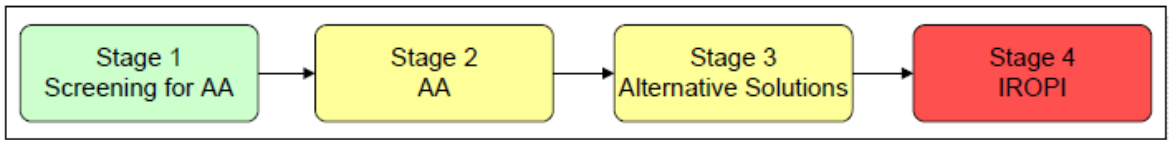
Article 6(3) & (4) of the Habitats Directive defines a step-wise procedure where plans or projects are considered. The Department of the Environment, Heritage and Local Government guidelines[1] (DoELHG, 2009, rev 2010) outlines the European Commission's methodological guidance (EC, 2002) promoting a four-stage process to complete the AA, and outlines the issues and tests at each stage. An important aspect of the process is that

[1] Now the Department of Housing Planning Community and Local Government

the outcome at each successive stage determines whether a further stage in the process is required.

The four stages are summarised diagrammatically in **Figure 2-1**. Stages 1-2 deal with the main requirements for assessment under Article 6(3). Stage 3 may be part of the Article 6(3) Assessment or may be a necessary precursor to Stage 4. Stage 4 is the main derogation step of Article 6(4).

Figure 2-1: Four Stages of Appropriate Assessment[2]



Stage 1 Appropriate Assessment

Stage 1 AA comprises the Screening process that addresses and records the reasoning and conclusions in relation to the first two tests of Article 6(3) as follows:

i. whether a plan or project (in this instance the proposed residential development) is directly connected to or necessary for the management of the European sites, and
ii. whether a plan or project, alone or in combination with other plans and projects, is likely to have significant effects on the European sites in view of their conservation objectives.

If the effects are deemed to be significant, potentially significant, or uncertain, or if the screening process becomes overly complicated, then the process must proceed to Stage 2 (AA).

Stage 2: Appropriate Assessment

The aim of the stage 2 AA process is to identify any adverse impacts that the plan or project might have on the integrity of relevant European sites. As part of the assessment, a key consideration is 'in combination' effects with other plans or projects. Where adverse impacts are identified, mitigation measures can be proposed that would avoid, reduce or remedy any such negative impacts and the plan or project can be amended and / or conditions and restrictions imposed. If it is considered that mitigation measures will not be able to satisfactorily reduce potential adverse impact on a Natura 2000 site then an assessment of alternative solutions is considered in Stage 3. This is then followed by Stage 4 in the event that adverse impacts remain and the proposed activity or development is deemed to be of Imperative Reasons of Overriding Public Interest (IROPI), allowing an assessment of compensatory measures to be considered.

This NIS informs Stage 2 of the AA process and determines if the project is likely to affect the integrity (structure and function) of European sites. As the screening process identified that potential impacts to Cork Harbour SPA and Great Island Channel SAC are unknown, uncertain or cannot be ruled out without further assessment, then an AA is required.

The NIS represents a detailed, targeted assessment of the nature and potential significance of direct and indirect impacts arising from the proposed project. An assessment of cumulative impacts (both from the project objectives, and other policies, plans and

[2] IROPI – Imperative Reasons for Overriding Public Interest

programmes) is also completed as part of the NIS. The NIS also incorporates best practice and mitigation measures to eliminate potential adverse impacts.

This NIS has been prepared having regard to the following guidance and legislation:

Guidance

- Department of the Environment, Heritage and Local Government (DoEHLG) (2009, rev 2010a), *Appropriate Assessment of Plans and Projects in Ireland Guidance for Planning Authorities.*
- Department of the Environment, Heritage and Local Government (DoEHLG, 2010b), *Department of Environment Heritage and Local Government Circular NPWS 1/10 and PSSP 2/10 on Appropriate Assessment under Article 6 of the Habitats Directive – Guidance for Planning Authorities*.
- EPA (2013) *Integrated Biodiversity Impact Assessment – Streamlining AA, SEA and EIA Processes: Practitioners Manual*. Environmental Protection Agency.
- European Commission (2018), *Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC*, Office for Official Publications of the European Communities, Luxembourg.
- European Commission (2000a), *Communication from the Commission on the Precautionary Principle*, Office for Official Publications of the European Communities, Luxembourg.
- European Commission (2002), *Assessment of Plans and Projects Significantly Affecting Natura 2000 Sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC*, Office for Official Publications of the European Communities, Luxembourg.
- European Commission (2007) *Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC – Clarification of the concepts of: alternative solutions, imperative reasons of overriding public interest, compensatory measures, overall coherence, opinion of the Commission.* Office for Official Publications of the European Communities, Luxembourg.
- European Commission (2013), *Interpretation Manual of European Union Habitats. Version EUR 28.*
- European Commission (2006), *Nature and biodiversity cases: Ruling of the European Court of Justice*. Office for Official Publications of the European Communities.

3 European Sites within Project Zone of Influence

The findings of the Screening for AA concluded that two European sites; Cork Harbour SPA and Great Island Channel SAC are located within the ZoI of the proposed residential development.

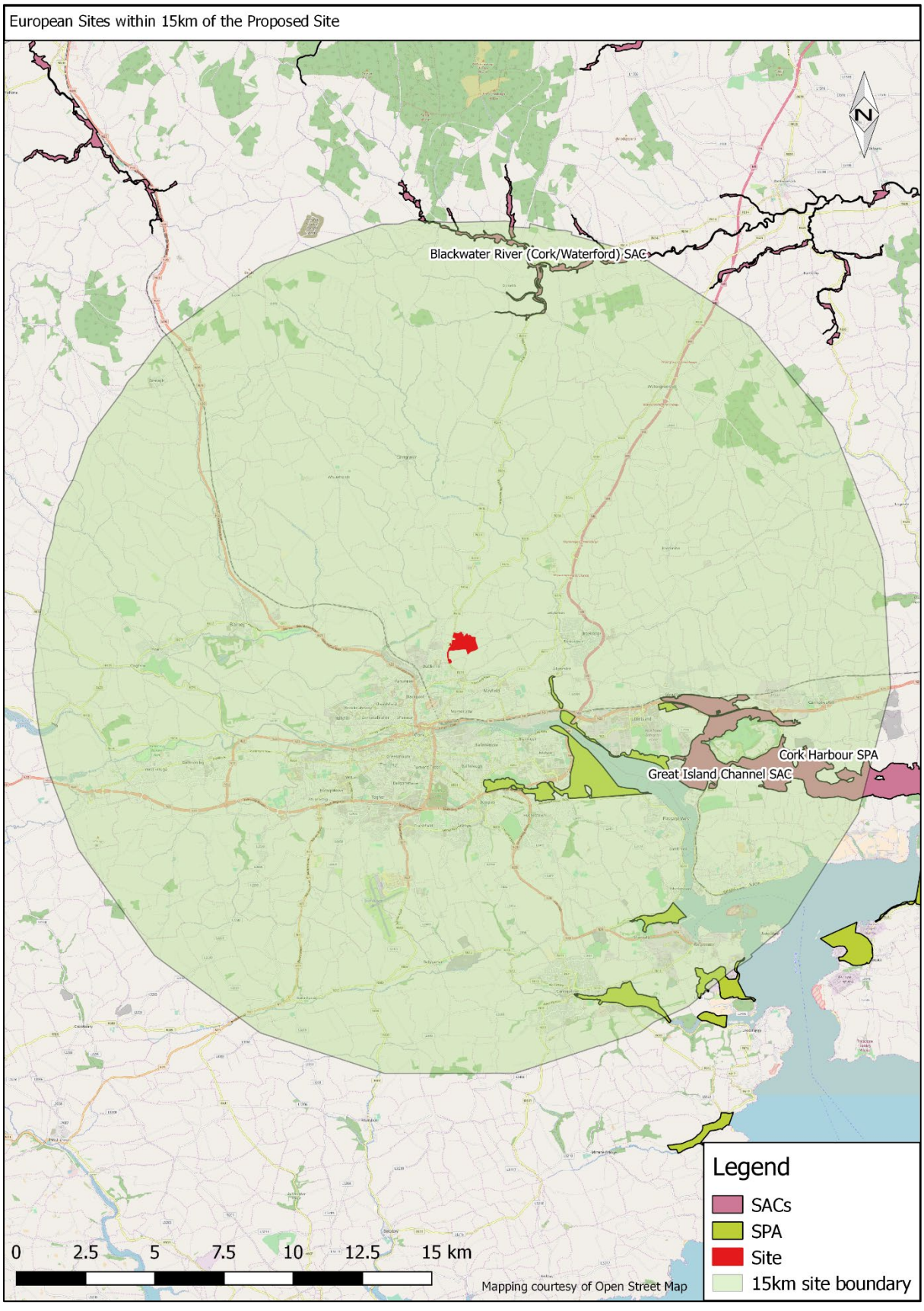
Table 3-1 lists the European sites and their proximity and connectivity to the proposed residential development. **Figure 3-1** outlines the location of these European sites relative to the proposed residential development footprint.

Table 3-1: Connectivity of European Sites within 15km of the Proposed Residential Development

European Site	Distance from Proposed Site (km)[3]	Connectivity
Great Island Channel SAC	6.9km	There is no robust surface water connectivity. However, there is tenuous indirect connectivity via field drains at the site which drain into an unnamed watercourse to the west of Ballyhooly Road. This watercourse then flows into the Ballincolly River, which ultimately drains into the open waters of Cork Harbour.
Cork Harbour SPA	2.8km	There is no direct surface water connectivity. However, there is indirect connectivity via field drains at the site which drain into an unnamed watercourse to the west of Ballyhooly Road. This watercourse then flows into the Ballincolly River, which ultimately drains into Cork Harbour SPA.

[3] Distance measured "as the crow flies"

Figure 3-1: European Sites within 15km of the Proposed Site



3.1 Summary of European Sites Relevant to the Stage 2 Appropriate Assessment

3.1.1 Great Island Channel SAC

The Standard Data Form (NPWS, 2017) describes Great Island Channel SAC as comprising the north-eastern part of Cork Harbour. It includes all of the Great Island Channel, the intertidal areas between Fota Island and Little Island, and also the estuary of the Dungourney and Owennacurra Rivers as far as Midleton. The North Channel is on average 1 km wide but extends for about 9 km from east to west. The area is well sheltered and the intertidal sediments are predominantly fine muds. In addition to the estuarine habitats, the site includes some wet grassland areas which are used by roosting birds, as well as some broad-leaved woodland at Fota Island. Compared to the rest of Cork Harbour, the Great Island Channel is relatively undisturbed, with aquaculture the main activity.

The site is of ecological importance for its examples of intertidal mud and sand flats and Atlantic salt meadows of the estuarine type. Both habitats are fairly extensive in area and of moderate to good quality. The site has high ornithological importance, supporting regularly c.50% of the wintering waterfowl of Cork Harbour. Significant proportions of the internationally important populations of *Limosa limosa* and *Tringa tetanus,* which winter in Cork Harbour, utilise the site and it supports nationally important populations of a further 12 species, including *Pluvialis apricaria* and *Limosa lapponica*, both listed on Annex I of the EU Birds Directive.

The Site Synopsis, Conservation Objectives and Standard Data Form for Great Island Channel SAC are enclosed in **Appendix B**.

3.1.1.1 Qualifying Interests

The importance of a site designated under the Habitats Directive is defined by its qualifying features or interests. Qualifying interests for any European Site are listed on a pro forma, called the Natura 2000 standard data form, which forms the basis of the rationale behind designation, and informs the Conservation Management Plan for targeted management and monitoring of key species and habitats.

Qualifying interests for Great Island Channel SAC are given in **Table 3-2**, along with the conservation status and specific sensitivities and main threats relevant to each feature. Information on the conservation status for each habitat within the SAC was extracted from the Natura 2000 Standard Data Form on the NPWS website http://www.npws.ie/protectedsites/. This information provides specific details on the conservation status of each habitat within the SAC. The environmental sensitivities have been derived from *The Status of EU Protected Habitats and Species in Ireland*[4].

Table 3-2: Conservation Status and Main Threats to the Qualifying Interests of Great Island Channel SAC

Annex I Habitat	Conservation Status at Great Island Channel SAC[5]	Environmental Sensitivity/ Main Threats (Ranked High to Medium)
Mudflats and sandflats not covered by seawater at low tide (1140)	B= Good conservation status.	• Pollution to surface waters (limnic & terrestrial, marine and brackish (H01) • Fishing and harvesting aquatic resources (F02) • Bottom culture (F01.03)

[4] NPWS (2013): The Status of EU Protected Species and Habitats in Ireland. Habitats Assessment Volume 2. Version 1.1. Department of Arts, Heritage and Gaeltacht.

[5] Natura 2000 Standard Data Forms version date September 2017

		• Suspension culture (F01.02)
Atlantic salt meadows (Glauco-Puccinellietalia maritimae) (1330)	B= Good conservation status.	• Intensive cattle grazing (A04.01.01) • Intensive sheep grazing (A04.01.02) • Paths, tracks, cycling tracks (D01.01) • Erosion (K01.01) • Invasive non-native species (I01)

3.1.1.2 Threats and Pressures to Great Island Channel SAC

The Natura Standard Data Form for Great Island Channel SAC identifies the most important threats and pressures (high and medium) on this site as detailed in **Table 3-3**.

Table 3-3: Negative Threats, Pressures and Activities with impacts to the Great Island Channel SAC

Threats and Pressures (Code)[6]	Threat Type	Rank[7]	Inside(i) / Outside (o) / Both (b)
E01	Urbanised areas, human habitation	H	o
D01.02	Roads, motorways	H	i
F01	Marine and freshwater aquaculture	H	i
A08	Fertilisation	M	o
A04	Grazing	M	i
K02.03	Eutrophication (natural)	M	i
J02.01.02	Reclamation of land from sea, estuary or marsh	H	i
I01	Invasive non-native species	M	i

3.1.2 Cork Harbour SPA

The Standard Data Form (NPWS, 2017) describes Cork Harbour as a large, sheltered bay system, with several river estuaries - principally those of the Rivers Lee, Douglas, Owenboy and Owenacurra. The site comprises the main intertidal areas of Cork Harbour, including all of the North Channel, the Douglas Estuary, inner Lough Mahon, Monkstown Creek, Lough Beg, the Owenboy Estuary, Whitegate Bay and the Rostellan inlet. Owing to the sheltered conditions, the intertidal flats are often muddy in character. Salt marshes are scattered through the site and these provide high tide roosts for the birds. Otherwise, birds roost on stony shorelines and in some areas fields adjacent to the shore. Some shallow bay water is included in the site. Cork Harbour is adjacent to a major urban centre and a major industrial centre.

Cork Harbour is an internationally important wetland site, regularly supporting in excess of 20,000 wintering waterfowl, for which it is amongst the top five sites in the country. It

[6] Threat code sourced from Natura 2000 data form and follows reference list provided on threats, pressures and activities for European sites

[7] Threat, pressure and impact ranking provided on Natura 2000 data form: H – High, M – Medium, L - Low

supports an internationally important population of *Tringa totanus*. A further 15 species have populations of national importance, with particularly notable numbers of *Tadorna tadorna* (9.6% of national total), *Anas clypeata* (4.5% of total), *Anas acuta* (4.2% of total) and *Phalacrocorax carbo* (4.1% of total) occurring. It has regionally important populations of *Pluvialis apricaria* and *Limosa lapponica*. Passage waders are regular, including *Philomachus pugnax* and *Tringa erythropus*. It is an important site for gulls in winter and autumn, especially *Larus canus* and *Larus fuscus*. The site provides both feeding and roosting areas for the waterfowl species. The quality of most of the estuarine habitats is good. The wintering birds have been well-monitored since the 1970s. The site has a breeding colony of *Sterna hirundo* which is of national importance. The colony is monitored annually and the chicks ringed.

The Site Synopsis, Conservation Objectives and Standard Data Form for Cork Harbour SPA are enclosed in **Appendix C**.

3.1.3 Conservation Condition of Special Conservation Interests for Cork Harbour SPA

The Conservation Objectives Supporting document for Cork Harbour SPA (NPWS, 2014a) provides a review of the site conservation condition and population trends for Cork Harbour SPA with regard to species' all-Ireland and international trends (see **Table 3-4**). All-Ireland trends follow Crowe & Holt (2013) while International trends follow Wetlands International (2012).

Table 3-4: SCI Species of Cork Harbour SPA – Current Site Conservation Condition

Special Conservation Interests	BoCCI Category[8]	Site Population Trend[9]	Site Conservation Condition	Current All-Ireland Trend[10]	Current International Trend[11]
Shelduck	Amber	- 39	Unfavourable	Stable	Increasing
Wigeon	Red	- 27	Unfavourable	Declining	Stable
Teal	Amber	- 1	(Intermediate) Unfavourable	Stable	Increasing
Pintail	Red	- 65	Highly Unfavourable	Increasing	Increasing
Shoveler	Red	- 75	Highly Unfavourable	Increasing	Increasing
Red-breasted Merganser	Green	- 51	Highly Unfavourable	Stable	n/c
Little Grebe	Amber	+ 16	Favourable	Stable	Increasing
Great Crested Grebe	Amber	- 46	Unfavourable	Declining	Declining?
Cormorant	Amber	- 50	Highly Unfavourable	Stable	Increasing
Grey Heron	Green	- 15	(Intermediate) Unfavourable	Stable	Increasing

[8]After Colhoun & Cummins, 2013
[9]Site population trend analysis
[10] All-Ireland trend - where a species is deemed to be increasing or declining if the annual rate of change is equal to or greater than 1.2% (after Crowe & Holt, 2013)
[11]Current international trend after Wetlands International (2012).

Special Conservation Interests	BoCCI Category[8]	Site Population Trend[9]	Site Conservation Condition	Current All-Ireland Trend[10]	Current International Trend[11]
Oystercatcher	Amber	- 20	(Intermediate) Unfavourable	Stable	Declining
Golden Plover	Red	+ 21	Favourable	Declining	Declining
Grey Plover	Amber	- 68	Highly Unfavourable	Declining	Declining?
Lapwing	Red	- 68	Highly Unfavourable	Declining	Stable
Dunlin	Red	- 49	Unfavourable	Declining	Stable
Black-tailed Godwit	Amber	+ 16	Favourable	Increasing	Increasing
Bar-tailed Godwit	Amber	+ 41	Favourable	Stable	Increasing
Curlew	Red	-44	Unfavourable	Declining	Declining
Redshank	Red	-29	Unfavourable	Stable	Stable/Increasing?
Black-headed Gull	Red	- 53	Highly Unfavourable	n/c	n/c
Common Gull	Amber	- 89	Highly Unfavourable	n/c	n/c
Lesser Black-backed Gull	Amber	- 83	Highly Unfavourable	n/c	n/c

Table 3-4 also shows the relationship between a species' long-term site trend and the current All-Ireland trend for the period 1999/00 to 2010/11. The colour coding used represents the following cases:-

- Grey – un-assessed;
- Green – species whose populations are stable or increasing at both site level and all-Ireland level;
- Beige – species whose populations are declining at both site level and all-Ireland level. Therefore there is a potential for factors at a larger spatial scale to be influencing the observed trend at site level;
- Orange - species whose populations are exhibiting a 1.0 – 24.9% decline at site level but are stable or increasing at all-Ireland level;
- Pink - species whose populations are exhibiting a 25.0 – 49.9% decline at site level but are stable or increasing at all-Ireland level; and
- Red - species whose populations are exhibiting a decline of >50.0% at site level but are stable or increasing at all-Ireland level.

The pink and red categories display where populations are stable or increasing at All-Ireland level, but where significant declines are observed at a site level within Cork Harbour SPA. Leech *et al*. (2002) suggests that site-based management issues may be responsible for such patterns in the observed declining site population trends.

3.1.3.1 Threats and Pressures to Cork Harbour SPA

The Natura Standard Data Form for Cork Harbour SPA identifies the most important threats and pressures (high and medium) on this SPA as detailed in **Table 3-5**.

Table 3-5: Negative Threats, Pressures and Activities with impacts to Cork Harbour SPA

Threats and Pressures (Code)	Threat Type	Rank	Inside (i) / Outside (o) / Both (b)
D01.02	Roads, motorways	H	o
G01.02	Walking, horse-riding and non-motorised vehicles	M	i
F02.03	Leisure fishing	M	i
D03.01	Port areas	H	o
A08	Fertilisation	M	o
F01	Marine and freshwater aquaculture	H	i
G01.01	Nautical sports	M	i
E01	Urbanised areas, urban habitation	H	o
E02	Industrial or commercial areas	H	o
D03.02	Shipping lanes	M	i

3.2 Conservation Objectives of European Sites

Article 6.3 of the Habitats Directive and Part XAB of the Planning and Development Act 2000- 2019 require that the impact of the project (either alone or in combination with other projects or plans) on the integrity of the European site is considered with respect to the conservation objectives of the site and to its structure and function. The European Commission guidance on Natura 2000 (MN2000) states that:-

> *"The integrity of the site involves its constitutive characteristics and ecological functions. The decision as to whether it is adversely affected should focus on and be limited to the habitats and species for which the site has been designated and the site's conservation objectives"* (MN2000, Section 4.6.4)."

The maintenance of favourable condition of qualifying interests at the site level will contribute to the overall maintenance of favourable conservation status of those habitats and species at a national level. Favourable conservation status of habitats and species is described in the Guidance as follows:

- **Favourable conservation status** of a **habitat** can be described as being achieved when: *"its natural range, and the area it covers within that range, is stable or increasing, and the ecological factors that are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and the conservation status of its typical species is favourable"*.
- **Favourable conservation status** of a **species** can be described as being achieved when: *"population data on the species concerned indicate that it is maintaining itself, and the natural range of the species is neither being reduced or likely to be reduced for the foreseeable future, and there is, and will probably continue to be, sufficiently large habitat to maintain its populations on a long term basis".*

Site-specific conservation objectives aim to define favourable conservation conditions for the qualifying interests, i.e. Annex I habitat and Annex II species, as applicable. The conservation objectives are presented as a list of attributes against which targets have been set. All of the attributes for each relevant feature have been considered in relation to the potential impacts associated with the proposed residential development. Site specific conservation objectives (SSCOs) for the qualifying interests of Great Island Channel SAC and Cork Harbour SPA are detailed in **Table 3-6** and **Table 3-7** below.

Table 3-6: Site Specific Conservation Objectives, Attributes and Targets for Qualifying Habitats of Great Island Channel SAC[12]

Conservation Objectives of Great Island Channel SAC			
Mudflats and Sandflats Not Covered by Seawater at Low Tide (1140)			
Attribute	**Measure**	**Target**	**Notes**
Habitat Area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes	Habitat area was estimated using as 723ha using OSi data
Community Distribution	Hectares	Conserve the following community type in a natural condition: Mixed sediment to sandy mud with polychaetes and oligochaetes community complex.	Based on intertidal and subtidal surveys undertaken in 2006 (Aquafact, 2007) and 2011 (EcoServe, 2012; MERC, 2012).
Atlantic Salt Meadows (Glauco-Puccinellietalia Maritimae) (1330)			
Attribute	**Measure**	**Target**	**Notes**
Habitat Area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession. For sub-sites mapped: Bawnard - 0.29ha; Carrigatohill - 1.01ha. See map 5	Based on data from Saltmarsh Monitoring Project (SMP) (McCorry and Ryle, 2009). Two sub-sites that supported Atlantic salt meadow were mapped (1.30ha) and additional areas of potential saltmarsh (17.60ha) were identified from an examination of aerial photographs, giving a total estimated area of 18.90ha. Saltmarsh habitat has also been recorded at two other sub-sites within the SAC (Curtis and Sheehy Skeffington, 1998). Further un-surveyed areas maybe present within the SAC. See coastal habitats supporting document for further details
Habitat Distribution	Occurrence	No decline or change in habitat distribution, subject to natural processes. See map 5 for known distribution	Based on data from McCorry and Ryle (2009). Within the sites surveyed by the SMP, estuary type saltmarsh over a mud substrate is most common

[12] NPWS (2014b) Conservation Objectives: Great Island Channel SAC (Site Code: 001058). Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs. June 2014

Conservation Objectives of Great Island Channel SAC			
			and Atlantic Salt Meadows (ASM) is the dominant saltmarsh habitat. Further un-surveyed areas maybe present within the SAC. See coastal habitats supporting document for further details
Physical Structure: Sediment Supply	Presence / absence of physical barriers	Maintain/restore natural circulation of sediments and organic matter, without any physical obstructions	Based on data from McCorry and Ryle (2009). At Bawnard there is a seawall that was constructed in the 18th-19th centuries. At Carrigatohil the northern and eastern shorelines have been significantly modified by road construction. Part of the saltmarsh has also been infilled. See coastal habitats supporting document for further details
Physical Structure: Creeks and Pans	Occurrence	Maintain/restore creek and pan structure, subject to natural processes, including erosion and succession	Based on data from McCorry and Ryle (2009). The ASM at Carrigatohil is poorly developed, though some of the larger sections contain salt pans. The smaller sections, however, tend to be quite uniform in topography. The saltmarsh topography at Bawnard is poorly developed with few typical saltmarsh features. See coastal habitats supporting document for further details.
Physical Structure: Flooding Regime	Hectares flooded; frequency	Maintain natural tidal regime	Based on data from McCorry and Ryle (2009). At Bawnard, the entire bay empties at low tide to expose soft intertidal mudflats. See coastal habitats supporting document for further details
Vegetation Structure: Zonation	Occurrence	Maintain range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	Based on data from McCorry and Ryle (2009). Zonation to Salicornia flats and intertidal mudflats occurs at Carrigatohil. At Bawnard, there is succession from saltmarsh to brackish saltmarsh and wet grassland as well as zonation to intertidal mudflats at the lower saltmarsh boundary. See coastal habitats supporting document for further details
Vegetation Structure: Vegetation Height	Centimetres	Maintain structural variation within sward	Based on data from McCorry and Ryle (2009). At Carrigatohil, the sward height is quite tall due to lack of grazing. At Bawnard only part of the site is grazed. See coastal habitats supporting document for further details

Conservation Objectives of Great Island Channel SAC			
Vegetation Structure: Vegetation Cover	Percentage cover at a representative number of monitoring stops	Maintain more than 90% area outside creeks vegetated	Based on data from McCorry and Ryle (2009). Some poaching was noted in places at Bawnard. See coastal habitats supporting document for further details
Vegetation Composition: Typical Species and Sub-Communities	Percentage cover at a representative number of monitoring stops	Maintain range of sub--communities with typical species listed in SMP (McCorry and Ryle, 2009)	See coastal habitats supporting document for further details
Vegetation Structure: Negative Indicator Species – *Spartina Anglica*	Hectares	No significant expansion of common cordgrass (*Spartina anglica*), with an annual spread of less than 1% where it is known to occur	Based on data from McCorry and Ryle (2009).Spartina occurs at both sub-sites in this SAC. See coastal habitats supporting document for further details

Table 3-7: Site-Specific Conservation Objectives, Attributes and Targets for Qualifying Interests of Cork Harbour SPA[13]

Over-Wintering Bird Populations for Cork Harbour SPA			
Conservation Objective: To maintain the favourable conservation condition of the following over-wintering species in Cork Harbour SPA (Little Grebe, Great Crested Grebe, Cormorant, Grey Heron, Shelduck, Wigeon, Teal, Pintail, Shoveler, Red-breasted Merganser, Oystercatcher, Golden Plover, Grey Plover, Lapwing, Dunlin, Black-tailed Godwit, Bar-tailed Godwit, Curlew, Redshank, Black-headed Gull, Common Gull, Lesser Black-backed Gull) which is defined by the following list of attributes and targets:			
Attribute	**Measure**	**Target**	**Notes**
Population Trend	Percentage Change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by these species other than that occurring from natural patterns of variation	Waterbird distribution from 2010/2011 waterbird survey programme is discussed in part five of the conservation objectives supporting document
Conservation Objective: To maintain the favourable conservation condition of the following breeding species in Cork Harbour SPA (Common Tern), which is defined by the following list of attributes and targets:			
Attribute	**Measure**	**Target**	**Notes**
Breeding Population	Number	No significant decline	Measure based on standard tern survey methods (see Walsh et

[13] NPWS (2014a) Conservation Objectives: Cork Harbour SPA (Site Code: 004030). Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs. December 2014

Over-Wintering Bird Populations for Cork Harbour SPA			
Abundance: Apparently Occupied Nests (AONs)			al., 1995). Wilson et al. (2000) provides background summary population information for the Cork Harbour area. In 2012 the total population of common terns that nested within the wider Cork Harbour was between 85 and 95 pairs, a proportion of which now breeds outside the SPA (RPS, 2014)
Productivity Rate: Fledged Young Per Breeding Pair	Mean number	No significant decline	Measure based on standard tern survey methods (see Walsh et al., 1995). The Seabird Monitoring Programme (SMP) (JNCC, 2014) provides population data for this species
Distribution: Breeding Colonies	Number; location; area (hectares)	No significant decline	Common tern breeding colonies can be sited in both coastal and inland areas using a wide variety of habitats including sandy, rocky or well-vegetated islands in estuaries, lakes and rivers. This species can also use artificial substrates (Del Hoyo et al., 1996). First recorded nesting in saltmarsh in 1969-70 (Smiddy, 1985), the colony now largely breeds on artificial structures in at least two locations (see Wilson et al., 2000 and RPS, 2014)
Prey Biomass Available	Kilogrammes	No significant decline	Key prey items: Small fish, crustaceans, insects and occasionally squid. Key habitats: common tern forage in/over shallow coastal waters, bays, inlets, shoals, tidal-rips, drift lines, beaches, saltmarsh creeks, lakes, ponds or rivers. Foraging range: max. 37km, mean max. 33.81km, mean 8.67km (Birdlife International Seabird Database (Birdlife International, 2014))
Barriers to Connectivity	Number; location; shape; area (hectares)	No significant increase	Seabird species can make extensive use of marine waters adjacent to their breeding colonies. Foraging range: max. 37km, mean max. 33.81km, mean 8.67km (BirdLife International Seabird Database (Birdlife International, 2014))
Disturbance at the Breeding Site	Level of impact	Human activities should occur at levels that do not adversely affect the breeding	In the Cork Harbour area, this species largely breeds on

Over-Wintering Bird Populations for Cork Harbour SPA			
		common tern population	artificial structures (see Wilson et al., 2000 and RPS, 2014)
Conservation Objective: To maintain the favourable conservation condition of the wetland habitat in Cork Harbour SPA as a resource for the regularly-occurring migratory waterbirds that utilise it. This is defined by the following attribute and target:			
Attribute	**Measure**	**Target**	**Notes**
Wetland Habitat Area	Hectares	The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 2,587 hectares, other than that occurring from natural patterns of variation	The wetland habitat area was estimated as 2,587ha using OSi data and relevant orthophotographs. For further information see part three of the conservation objectives supporting document

4 Existing Environment

Ecological surveys of the proposed site were undertaken between March 2017 and September 2019. The surveys assessed the potential for Qualifying Interests (QIs) and Species of Conservation Interest (SCIs) of European sites within the ZoI of the proposed development and third schedule [14] invasive species to occur within the proposed site.

4.1 Habitats

Ecological surveys of the proposed site were carried out by ecologist Ms. Karen Banks between March 2017 and September 2019.

The habitat and flora site assessment was carried out in accordance with current guidelines (Smith et al. 2010).The habitats found in the study area were classified in accordance with the guidelines set out in 'A Guide to Habitats in Ireland' (Fossitt, 2000), which classifies habitats based on the vegetation present and management history. Any other records of interest (e.g. invasive plant species) were also noted.

In summary, the site comprises fields of arable crops (BC1) bound by hedgerows (WL1), treelines (WL2) and two small wet ditches (FW4). No Annex I habitat was recorded within the proposed site and its immediate environs.

No non-native plant species listed in the Third Schedule were recorded within the proposed site during the site surveys. One small stand of Japanese Knotweed was recorded c.25m outside of the site boundary, to the west of Ballyhooly Road.

4.2 Hydrology and Water Quality

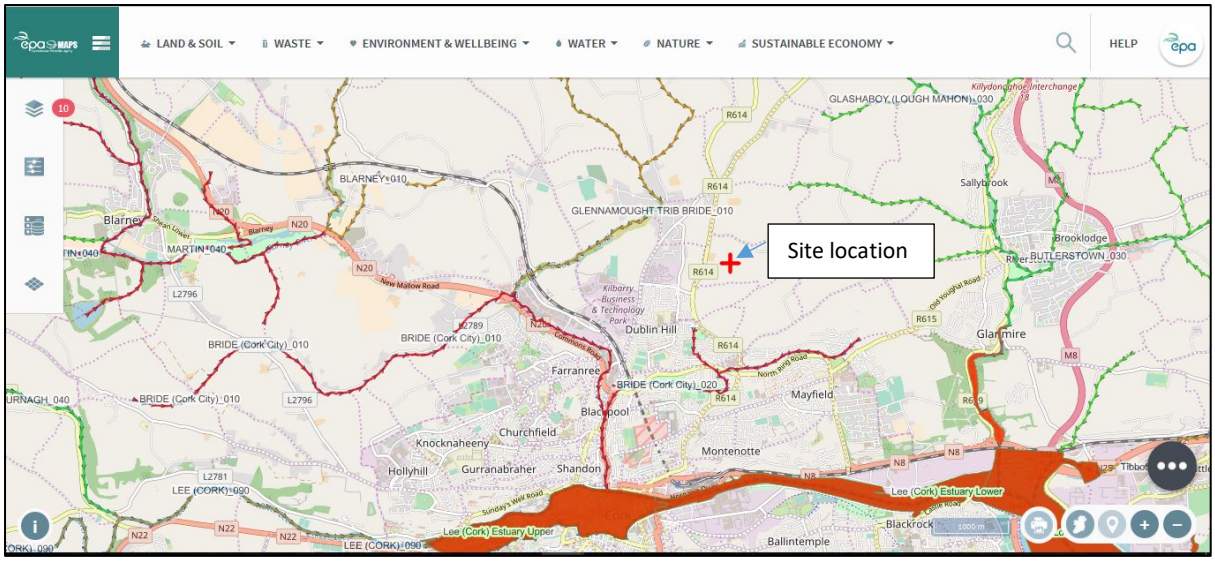
There are no streams, rivers or waterbodies located within the site. Field drains to the west of the site drain to Ballyhooly Road and are then culverted to an unnamed watercourse adjacent to the west of Ballyhooly road, which is not included in EPA mapping. This watercourse drains the pasture and arable lands to the west of the proposed site and has been heavily modified so that it runs parallel to Ballyhooly Road.

The unnamed watercourse is included in EPA mapping as the Ballincolly watercourse c.124m to the south west of the proposed pumping station. The Ballincolly is a small first order stream, which is further culverted at Kempton Park for c.0.8km before flowing into the Glen River, a second order watercourse. The Glen River in turn confluences with the Kiln River (a 3rd order watercourse) c.2.2km downstream, before flowing into the River Lee, which is a large 6th order river, a further c.1.0km downstream. The River Lee is part of the Lee Estuary transitional waterbody, which flows into Cork Harbour.

No 'Q-values' are available for these watercourses. **Figure 4-1** below shows a screenshot of EPA mapped river network and Water Framework Directive (WFD) mapping for the site and surrounding area (the red cross on the map marks the site centre). The northernmost portion of the site is located within the Glennamought Trib Bride_010 WFD River Sub-basin; the southernmost portion of the site is within the Bride (Cork City)_020 River Sub-basin. The watercourses within the Bride (Cork City) Sub-basin are classified as 'At risk' under the WFD. The transitional water quality of the Lee (Cork) Estuary Lower (IE_SW_060_0900), into which the site ultimately drains, is classified as 'intermediate' and has been assigned as 'at risk' under the WFD.

[14] Invasive species scheduled to the EC (Birds and Natural Habitats) Regulations 2011-2015 ('the Regulations'). Under the Regulations, it is an offence to plant, disperse, allow or cause to disperse, spread or otherwise cause to grow in any place any species scheduled to the Regulations without a licence.

Figure 4-1: EPA mapping of the watercourses and waterbodies at the proposed site and its environs (https://gis.epa.ie/EPAMaps/)



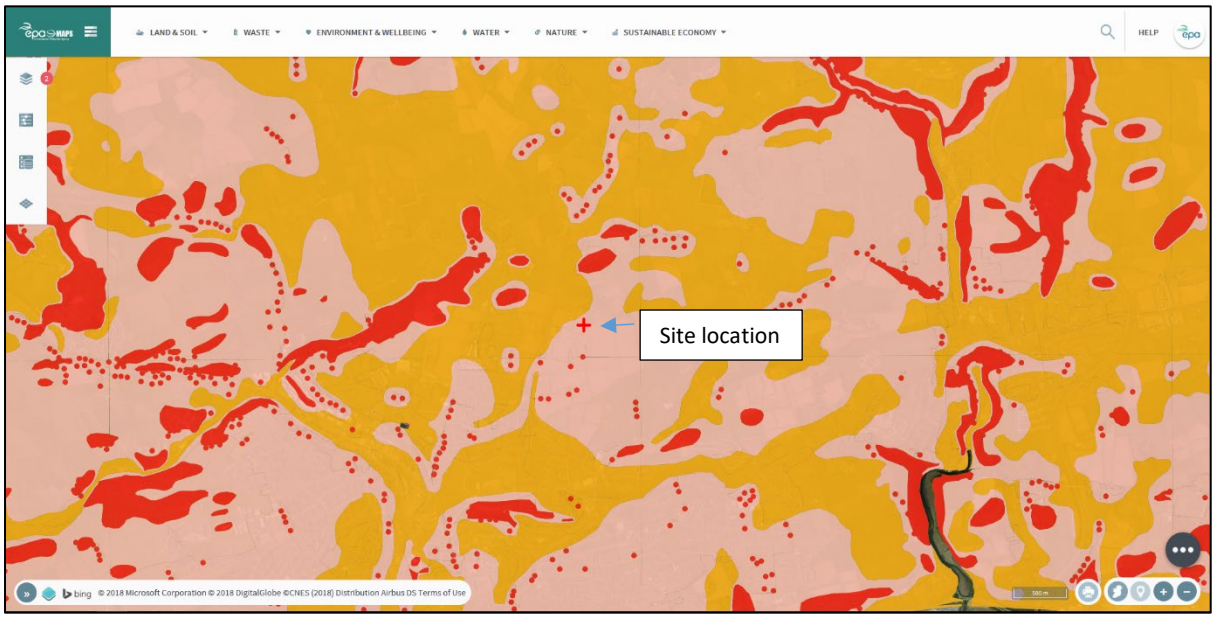
4.3 Soils, Geology and Hydrogeology

The GSI soils map (www.gsi.ie) for the site area indicates that the site and its environs are overlain by Deep well drained mineral (Mainly acidic) soils (AminDW), with an area of Mineral poorly drained (Mainly acidic) soils (AminPD) at the south-west of the site. In regards to bedrock geology, a band of Ballytrasna Formation composed of Purple mudstone and sandstone underlies the majority of the site; a band of Gyleen Formation composed of Sandstone with mudstone & siltstone underlies the south-east corner of the site.

The bedrock units which underlie the site are part of the same Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones. The groundwater vulnerability is described as Extreme (**Figure 4-2**). The regional groundwater flow direction will mimic that of topography and catchment drainage; flowing south west to the River Bride.

The proposed site is located within the Ballinhassig East WFD Groundwater Body (IE_SW_G_004), which is classified as being of 'Good' status under the WFD.

Figure 4-2: EPA mapping of aquifer vulnerability at the proposed site and its environs



4.4 Species

Fauna were surveyed through observation of field signs such as tracks, feeding signs and droppings. Habitats were assessed for their potential for use, or confirmed use, by protected species of fauna during the site walkover undertaken on 15th March 2017. The results of the site walkover then informed the scope of further taxon specific surveys, which included bat surveys undertaken between July 2017 and September 2019; and badger surveys undertaken between 2017 and 2019. In summary, the proposed site supports foraging soprano and common pipistrelle and Leisler's bat. The proposed site is part of the foraging area of badger and there is limited potential for the hedgerows and treelines at the site to provide shelter for badger.

No Annex II species were recorded at the proposed site.

Bird surveys were undertaken between March 2017 and April 2019 as detailed in the following section.

4.4.1 Avifauna

The proposed site is within 2km of the River Bride and its tributary the Glennamought, the Glen River; and tributaries of the Glashaboy River. Further, as detailed in Section 3, the proposed site is located 2.8km from Cork Harbour SPA. Therefore, a number of protected species of birds have been recorded within 2km of the proposed site (http://maps.biodiversityireland.ie). No species of Special Conservation Interest (SCIs) for Cork Harbour SPA were recorded on the proposed site during the site walkovers undertaken in 2017 and 2018 or the specific breeding bird surveys undertaken in July 2017 and April 2019.

A total of twenty species of bird were recorded during the breeding bird surveys within the proposed site. One species of High Conservation Concern (Red listed) was identified during the breeding bird surveys, namely yellowhammer, with 3 pairs of this species recorded during the survey undertaken in April 2019. Five Amber listed species considered to be of Moderate Conservation Concern were recorded during the breeding bird surveys, namely house sparrow, swallow, robin, greenfinch and snipe. The remaining fourteen bird species

recorded during the breeding bird surveys are Green listed and comprise a range of relatively common species typically associated with the hedgerow, garden and arable habitats present within, and adjacent to, the footprint of the proposed development. The arable fields and hedgerows, which dominate the proposed site provide some limited nesting to species typical of the intensified agricultural environment. The presence of 3 pairs of Yellowhammer is a noteworthy interest, given this is a Red-listed BOCCI, and breeding is considered probable.

No Annex I species were recorded during the course of the site surveys.

5 Impact Assessment

Impacts can be direct and indirect and the impacts that could potentially occur through the construction and operation of the proposed residential development are as follows:

- Changes in key indicators of conservation value such as decrease in water quality and quantity within Cork Harbour SPA and Great Island Channel SAC.

5.1 Direct Impacts

The proposed residential development is not located within lands designated for nature conservation, including Cork Harbour SPA and Great Island Channel SAC. Further, there are no resource requirements (e.g. excavation or abstraction) from European sites for the proposed development. Consequently, none of the lands designated as part of European sites will be directly impacted or removed as a result of the proposed residential development. Therefore, there will be no direct impacts to European sites in this regard.

5.2 Indirect Impacts

As detailed in the Screening for AA report (**Appendix A**) and **Section 4.2** of this report, there are potential source-pathway-receptor links between the proposed development and Cork Harbour SPA and Great Island Channel SAC. The proposed residential development is connected to Cork Harbour via field drains to the west of the site which are culverted under Ballyhooly Road to an unnamed watercourse to the west of the road. To the south-west of the site, this stream is included on EPA mapping as the Ballincolly watercourse, which confluences with the Glen River, which in turn confluences with the Kiln River before flowing into the River Lee and Cork Harbour SPA a total of 8.9km downstream of the proposed site. The groundwater vulnerability at the site is described as 'extreme', meaning that the site and its environs are vulnerable to pollutants discharged at ground level, based on the hydrological, geological, hydrogeological and soil properties (see **Section 4.3**). The proposed site is at 130m OD at the east of the site and slopes downwards to 70m OD at the west of the site, therefore the groundwater at the site flows in a westerly direction towards the drains adjacent to the west of the site and the area of poorly drained land at the south-west of the site.

By extension, the waters of Cork Harbour SPA provide indirect, but remote, connectivity to the nearest sections of the Great Island Channel SAC, which are located 6.9km south-east of the proposed site. Therefore, the proposed development may, in the absence of best practice and mitigation measures, impact indirectly on Cork Harbour SPA and by extension Great Island Channel SAC through indirect connectivity maintained by ditches draining the site.

5.2.1 Great Island Channel SAC

There are no direct hydrological links between the proposed site and Great Island Channel SAC, therefore there will be no direct discharges to surface water within Great Island Channel SAC from the site.

Indirect impacts to Great Island Channel SAC include potential run-off of construction phase pollutants into the receiving watercourse to the west of Ballyhooly Road, which ultimately drains to Cork Harbour SPA, which in turn provides a tenuous link to Great Island Channel SAC. Indirect impacts to this European site as a result of deterioration in water quality to Cork Harbour may impact upon the Annex I coastal habitats for which this European site is designated (see **Table 3-6**).

5.2.2 Cork Harbour SPA

There are no direct hydrological links between the proposed site and Cork Harbour, therefore there will be no direct discharges to surface water within Cork Harbour SPA from the site.

The potential impacts on Cork Harbour SPA as a result of the proposed works are limited to impacts primarily related to changes in water quality in watercourses down gradient of the proposed site, which ultimately drain into Cork Harbour, as discussed below.

Field drains at the site are connected via culverts to an unnamed stream to the west of Ballyhooly Road, which is included in EPA mapping as the Ballincolly watercourse c.124m to the south-west of the proposed pumping station. The Ballincolly watercourse confluences with the Glen River, which in turn confluences with the Kiln River before flowing into the River Lee and Cork Harbour.

Potential surface water emissions from the proposed development area may be generated by surface water run-off from hardstanding areas and overland flow during periods of heavy rainfall. Excavation of soil, subsoil and bedrock layers will be required in order to allow the construction of the roads network, reprofiling of ground to facilitate the construction of units, foundation excavation, drainage and utility services installation and the provision of underground attenuation/infiltration systems. There will be works associated with the crossing of the watercourse to the west of Ballyhooly road via direct drilling as part of the diversion of the 38KV Overhead ESB Line. In the absence of protective measures, indirect impacts may arise from the excavation and stockpiling of earth and construction material (sand, gravel, etc.) during the construction phase of the proposed development. Excavation and ground disturbance during the construction phase could potentially lead to suspended solids runoff into drainage systems adjacent to the site and eventually into Cork Harbour SPA.

There is also potential for a range of pollutants, such as concrete, hydrocarbons, or improper drainage from the contractors compound, to enter groundwater and drainage ditches and in turn Cork Harbour SPA during construction work and the transportation of materials to and from the construction site.

There is potential for the proposed residential development to contribute to negative impacts on water quality in Cork Harbour during the operational phase of the proposed development as a result of surface water and waste water discharges from the development. However, as noted in **Section 1.3.1**, surface water for the development will be treated by the incorporation of a Sustainable Urban Drainage System, including attenuation, storm water soakpits and hydrocarbon interceptors. Foul water will be treated at Carrigrenan WWTP, which has sufficient capacity for the proposed development. Therefore, it is considered that there will be no significant adverse impacts to designated sites during the operational phase of the proposed development.

5.3 Assessments of Habitats and Species of Conservation Interest

The site specific Conservation Objectives for Cork Harbour SPA are presented in **Section 3.2.** This section assesses the likelihood of the proposed residential development impacting the site specific conservation objectives and SCIs assigned for Great Island Channel SAC and Cork Harbour SPA.

5.3.1 Attributes for Great Island SAC

Great Island Channel SAC is designated for 2 no. Annex I habitats. Attributes and proposed targets to maintain favourable conservation condition for both of these habitats, in addition to potential impacts are described in **Table 5-1** below.

Table 5-1: Site-specific Conservation Objectives, Attributes, Targets and Potential Impacts for Great Island Channel SAC

Conservation Objectives of Great Island Channel SAC (NPWS, 2014b)			
Mudflats and Sandflats Not Covered by Seawater at Low Tide (1140)			
Attribute	**Measure**	**Target**	**Potential Impacts**
Habitat Area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes	The mudflat and sandflat habitat area associated with this Annex I habitat will not be impacted by the proposed development due to the remote and tenuous connectivity between the proposed site and this European site. There will be no loss or deterioration in area for this Annex I habitat.
Community Distribution	Hectares	Conserve the following community type in a natural condition: Mixed sediment to sandy mud with polychaetes and oligochaetes community complex.	The community distribution and condition of this Annex I habitat will not be impacted by the proposed development due to the remote and tenuous connectivity between the proposed site and this European site.
Atlantic Salt Meadows (Glauco-Puccinellietalia Maritimae) (1330)			
Attribute	**Measure**	**Target**	**Potential Impacts**
Habitat Area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession. For sub-sites mapped: Bawnard - 0.29ha; Carrigtohill - 1.01ha. See map 5	Atlantic Salt Meadows (1330) associated with Great Island Channel SAC will not be impacted by the proposed development due to the remote and tenuous connectivity between the proposed site and this European site. There will be no loss or deterioration in area for this Annex I habitat.
Habitat Distribution	Occurrence	No decline or change in habitat distribution, subject to natural processes. See map 5 for known distribution	Due to the remote and tenuous connectivity between the proposed development and this European site, there will be no decline or change in habitat distribution of this Annex I habitat.
Physical Structure: Sediment Supply	Presence / absence of physical barriers	Maintain/restore natural circulation of sediments and organic matter, without any physical obstructions	The physical structure of this Annex I habitat will not be impacted by the proposed development due to the remote and tenuous connectivity between the site and the Great Island Channel SAC.
Physical Structure: Creeks and Pans	Occurrence	Maintain/restore creek and pan structure, subject to natural processes, including erosion and succession	
Physical Structure:	Hectares flooded; frequency	Maintain natural tidal regime	

Conservation Objectives of Great Island Channel SAC (NPWS, 2014b)			
Flooding Regime			
Vegetation Structure: Zonation	Occurrence	Maintain range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	The vegetation zonation and range of this Annex I habitat will not be impacted by the proposed development due to the remote and tenuous connectivity between the site and the Great Island Channel SAC.
Vegetation Structure: Vegetation Height	Centimetres	Maintain structural variation within sward	The vegetation structure and sward variation of this Annex I habitat will not be impacted by the proposed development due to the remote and tenuous connectivity between the site and the Great Island Channel SAC.
Vegetation Structure: Vegetation Cover	Percentage cover at a representative number of monitoring stops	Maintain more than 90% area outside creeks vegetated	
Vegetation Composition: Typical Species and Sub-- Communities	Percentage cover at a representative number of monitoring stops	Maintain range of sub-- communities with typical species listed in SMP (McCorry and Ryle, 2009)	The vegetation composition of this Annex I habitat will not be impacted by the proposed development due to the remote and tenuous connectivity between the site and the Great Island Channel SAC.
Vegetation Structure: Negative Indicator Species – *Spartina Anglica*	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession. For sub-sites mapped: Bawnard - 0.29ha; Carrigatohil - 1.01ha. See map 5	The vegetation structure of this Annex I habitat will not be impacted by the proposed development to the remote and tenuous connectivity between the site and the Great Island Channel SAC.

5.3.2 Attributes for Over-wintering Populations of Cork Harbour SPA

Potential impacts to the attributes and associated targets for all over-wintering SCI species of Cork Harbour SPA are described in **Table 5-2** below.

Table 5-2: Site-specific Conservation Objectives, Attributes, Targets and Potential Impacts for Over-Wintering Bird Populations of Cork Harbour SPA

<table>
<tr><th colspan="4">Over-Wintering Bird Populations for Cork Harbour SPA (NPWS, 2014a)</th></tr>
<tr><td colspan="4">Conservation Objective: To maintain the favourable conservation condition of the following over-wintering species in Cork Harbour SPA (Little Grebe, Great Crested Grebe, Cormorant, Grey Heron, Shelduck, Wigeon, Teal, Pintail, Shoveler, Red-breasted Merganser, Oystercatcher, Golden Plover, Grey Plover, Lapwing, Dunlin, Black-tailed Godwit, Bar-tailed Godwit, Curlew, Redshank, Black-headed Gull, Common Gull, Lesser Black-backed Gull) which is defined by the following list of attributes and targets:</td></tr>
<tr><th>Attribute</th><th>Measure</th><th>Target</th><th>Potential Impacts</th></tr>
<tr><td>Population Trend</td><td>Percentage Change</td><td>Long term population trend stable or increasing</td><td>The findings of the desk and field based surveys completed to inform this NIS and the accompanying EIAR, confirm that the footprint of the proposed residential development and its immediate environs are not located within integral or routinely utilised over-wintering, roosting or feeding habitats critical for over-wintering populations of SCI species. The proposed residential development will not result in direct or indirect impacts to the SCI species for which this SPA is designated, therefore there will be no impacts or changes in population trend to Cork Harbour SPA.</td></tr>
<tr><td>Distribution</td><td>Range, timing and intensity of use of areas</td><td>No significant decrease in the range, timing or intensity of use of areas by these species other than that occurring from natural patterns of variation</td><td>Site surveys undertaken between 2017 and 2019 confirmed that the footprint and the immediate environs of the proposed residential development do not support or provide suitable habitat to support the distribution of SCI species for which this European site has been designated. Therefore, there will be no impacts or changes in distribution of over-wintering populations of SCI species.</td></tr>
<tr><td colspan="4">Conservation Objective: To maintain the favourable conservation condition of the wetland habitat in Cork Harbour SPA as a resource for the regularly-occurring migratory waterbirds that utilise it. This is defined by the following attribute and target:</td></tr>
<tr><th>Attribute</th><th>Measure</th><th>Target</th><th>Potential Impacts</th></tr>
<tr><td>Wetland Habitat Area</td><td>Hectares</td><td>The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 2,587 hectares, other than that occurring from natural patterns of variation</td><td>The proposed residential development will not result in the direct land-take of the wetland habitats comprising Cork Harbour SPA. Therefore, the proposed development will not impact this attribute for Cork Harbour SPA in this regard. Indirect impacts to wetland habitats associated with Cork Harbour SPA will be avoided through the implementation of best practice construction measures and surface and foul water design during the operational phase.</td></tr>
</table>

5.3.3 Attributes for Breeding Populations of Cork Harbour SPA

Cork Harbour SPA supports one SCI breeding species; i.e. Common Tern (*Sterna hirundo*). Attributes and proposed targets to maintain favourable conservation condition for this species in addition to potential impacts are described in **Table 5-3** below.

Table 5-3: Conservation Objectives, Attributes, Targets and Potential Impacts for Common Tern Population within Cork Harbour SPA[15]

A193 **Common Tern (*Sterna hirundo*)**			
To maintain the **favourable** conservation condition of Common Tern in Cork Harbour SPA, which is defined by the following list of attributes and targets:			
Attribute	**Measure**	**Target**	**Potential Impacts**
Breeding population abundance: apparently occupied nests (AONs)	Number	No significant decline	The proposed residential development is not located within or in proximity to breeding sites for Common Tern within Cork Harbour SPA. The mooring dolphins at Ringaskiddy deep water port support breeding populations of Common Tern. The proposed residential development will not directly impact upon key feeding or breeding habitats which sustain Common Tern in Cork Harbour SPA. Indirect impacts to this species through the deterioration of water quality in Cork Harbour will be mitigated through construction phase mitigation and surface and foul water design. The proposed residential development will not result in indirect disturbance effects through construction and operational phase activities to the Common Tern populations associated with Cork Harbour SPA.
Productivity rate: fledged young per Breeding pair	Mean number	No significant decline	
Distribution: breeding colonies	Number; location; area (hectares)	No significant Decline	
Prey biomass available	Kilogrammes	No significant decline	
Barriers to connectivity	Number; location; shape; area (hectares)	No significant increase	
Disturbance at the breeding site	Level of impact	Human activities should occur at levels that do not adversely affect the breeding common tern population	

5.4 Cumulative/ In-Combination Effects

It is a requirement of Appropriate Assessment that the cumulative or in-combination effects of the proposed development together with other Plans or projects are assessed. Cumulative impacts can result from the successive, incremental, and/or combined effects of a development (plan, project or activity) when added to other existing, planned, and/or reasonably anticipated developments.

[15] NPWS (2014) Conservation Objectives: Cork Harbour SPA 004030. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

A search of the Cork City planning enquiry system[16], My Plan[17] and the EIA Portal[18] was conducted for developments that may have in-combination effects on European sites with the proposed residential development. The search included developments that are proximal to the proposed site and those that may have an adverse cumulative or in-combination impact with the proposals on the water quality of Cork Harbour.

Plans relevant to the area were searched in order to identify any elements of the plans that may act cumulatively or in-combination with the proposed development.

A list of those projects and Plans which may potentially contribute to cumulative or in-combination impacts with the proposed residential development was generated for as listed in **Table 5-4** below.

Table 5-4: List of Potential Plans which may Contribute to Cumulative Impacts

Name of Plan	Key Issues Directly Linked to Relevant European Sites	Potential Cumulative or In-Combination Impacts on Relevant European Sites
Cobh Municipal District Plan (MDP) 2017	The MDP includes the following Objectives of relevance to the proposed site: General Development Objectives for Cork City North Environs. LAS-01: The Council is committed to the preparation and implementation of a Wastewater Management Strategy for the Cork Harbour Area as per the 2014 County Development Plan. NE-GO-02: In order to secure the sustainable population growth and supporting development proposed in NE-GO-01, appropriate and sustainable water and waste water infrastructure that will secure the objectives of the relevant River Basin Management Plan must be provided and be operational in advance of the commencement of any discharges from the development. Waste water infrastructure must be capable of treating discharges to ensure that water quality in the receiving harbour does not fall below legally required levels. NE-GO-06: Design an integrated approach to surface water management which considers land use, water quality, amenity and habitat enhancements, thereby replicating the current greenfield rate of surface water runoff, post development, to prevent flooding of lands and settlements downstream. A Sustainable Urban Drainage Strategy should be completed for the site prior to development. NE-GO-07: Create an ecological network by linking green areas to allow for movement of	The policies and objectives of the MDP will ensure that local planning applications comply with proper planning and sustainability and with the requirements of relevant EU Directives and environmental considerations; there is no potential for adverse in-combination effects on European Sites.

[16] http://planenquiry.corkcity.ie/planningenquiry/

[17] https://myplan.ie/

[18] https://www.housing.gov.ie/planning/environmental-assessment/environmental-impact-assessment-eia/eia-portal

Name of Plan	Key Issues Directly Linked to Relevant European Sites	Potential Cumulative or In-Combination Impacts on Relevant European Sites
	wildlife. All environmental resources should be incorporated from waterways to woodlands to adopt a green infrastructure approach within the site with links to the surrounding countryside. Open space for public recreation including the provision of playing pitches, amenity walks, children's playground, open parkland, subject to appropriate scaling and siting.	
Cork County Development Plan 2014-2020	The policies and objectives of this plan are intended to contribute to the delivery of a number of key aims for the county as a whole. They are as follows: ▪ Enhanced quality of life for all ▪ Sustainable patterns of growth in urban and ▪ rural areas ▪ Sustainable and balanced economic investment ▪ An effective physical and community ▪ Infrastructure ▪ A quality built environment ▪ A network of enhanced natural resources ▪ Responsible guardianship of the County	Policies and objectives of the Cork County Development Plan 2014 – 2020 ensure that local planning applications comply with proper planning and sustainability and with the requirements of relevant EU Directives and environmental considerations, there is no potential for adverse in-combination effects on European Sites.
River Basin Management Plan 2018-2021	The plan establishes the following priorities: • Ensure full compliance with relevant EU legislation • Prevent deterioration • Meet the objectives for designated protected areas • Protect high-status waters • Implement targeted actions and pilot schemes in focused sub-catchments aimed at (1) targeting water bodies close to meeting their objective and (2) addressing more complex issues that will build knowledge for the third cycle.	The implementation and compliance with key environmental policies, issues and objectives of this management plan will result in positive in-combination effects on European sites. It will not contribute to adverse in-combination or cumulative impacts with the proposed development.
Inland Fisheries Ireland Corporate Plan 2016 -2020 **The Inland Fisheries Act 2010.**	To ensure that Ireland's fish populations are managed and protected to ensure their conservation status remains favourable. That they provide a basis for a sustainable world class recreational angling product, and that pristine aquatic habitats are also enjoyed for other recreational uses. To develop and improve fish habitats and ensure that the conditions required for fish populations to thrive are sustained and protected.	Implementation and compliance with the goals of the IFI corporate plan and legislation will result in net positive in-combination effects to European sites.

Name of Plan	Key Issues Directly Linked to Relevant European Sites	Potential Cumulative or In-Combination Impacts on Relevant European Sites
	To grow the number of anglers and ensure the needs of IFI's other key stakeholders are being met in a sustainable conservation focused manner. EU (Quality of Salmonid Waters) Regulations 1988. All works during development and operation of the project must aim to conserve fish and other species of fauna and flora habitat; biodiversity of inland fisheries and ecosystems and protect spawning salmon and trout.	
Irish Water Capital Investment Plan 2014-2016	Proposals to upgrade and secure water services and water treatment services countrywide.	Likely net positive impact due to water conservation and more effective treatment of water.
IPPC Programme	The nearest facility is Heineken Ireland Limited (P0445), located c2.8km to the south-west of the proposed site.	Discharges from these facilities are governed by strict limits to ensure compliance with quality standards. The long-term cumulative impact is predicted to be negligible.
WwTP discharges	Cork City, Carrigtwohill and Environs and Passage- Monkstown.	Discharges from municipal WWTPs are required to meet water quality standards. Irish Water Capital Investment Plan 2014-2016 and 2017 – 2021 proposes to upgrade water treatment services countrywide. The long-term cumulative impact is predicted to be negligible.
Pumping Station	The proposed development includes the provision of two pumping stations. One Type 3 Pumping Station for local services in neighbourhood 5 is provided. Foul waste collected by this Pumping Station will then transferred to the main proposed pumping station on Ballyhooly Road which forms part of the planning application. This Pumping Station with access to the Ballyhooly Road to accommodate this site and future lands in the area can be constructed on a phased basis as it is a three chamber design.	A full assessment of the potential ecological impacts associated with the pumping station as part of the proposal has been carried out. The associated rising main route has been identified and pipe sizes identified. Delivery of the rising main will include the appropriate research and survey work necessary in order to inform a robust assessment of the potential impacts associated with the proposed works on European Sites within the Zone of Influence of the works. In consideration of this requirement, no adverse cumulative or in-combination impacts with the proposed development works at Ballyvolane on European sites are anticipated.

Name of Plan	Key Issues Directly Linked to Relevant European Sites	Potential Cumulative or In-Combination Impacts on Relevant European Sites
Water Supply	A new 250mm HDPE water supply pipeline extension of approximately 780m from the Dublin Hill area along Ballyhooly Road is required to reach the proposed development connection point. Works to be carried out by Irish Water.	With the implementation of standard best practice guidelines during construction, no cumulative impacts on European sites are expected.
Local Planning Applications[19]	Various local planning applications in proximity and within the Zone of Influence of the proposed residential development. These include a 20 unit residential development at Banduff Road, Banduff (Ref: 19/5326), 74 unit residential development in Ballincrokig (Ref: 17/6781), demolition of Lidl foodstore and construction of new foodstore with associated site works (Ref: 16/5477); and small scale domestic dwelling construction, extensions to domestic dwellings and public buildings and permission and retention permission for commercial development at Ballyvolane.	Adherence to the overarching policies and objectives of the Cork County Development Plan 2015 - 2020 ensure that local planning applications and subsequent grant of planning comply with the core strategy of proper planning and sustainability and with the requirements of relevant EU Directives and environmental considerations, there is no potential for significant adverse in combination effects on European Sites.
Redevelopment of Custom House, Cork City (Ref: 1938589)	Redevelopment of the Custom House site at North Custom House Quay and South Custom House Quay, Cork City, to provide a 240 bedroom hotel, 25 hotel serviced suites and a range of commercial uses.	A Natura Impact Statement (NIS) was prepared for the proposed development as part of the planning application. The potential for sediment laden run-off and pollutants to have an adverse impact on the water quality of Cork Harbour SPA and Great Island Channel SAC was identified. However, the NIS concluded that the mitigation measures provided in the NIS report will ensure that any effects on the conservation objectives of European sites will be avoided and that the construction and operation of the proposed development will not pose a risk of adversely affecting (either directly or indirectly) the integrity any European site, either alone or in combination with other plans or projects. As such, assuming that mitigation measures are effectively implemented, no significant adverse cumulative and in-combination impacts with the proposed development on the

[19] The Local Planning Applications included in this potential in-combination impacts assessment support the following criteria: planning applications granted within the past five years that may contribute to potential cumulative impacts on European sites of concern. They include planning applications that support proximity or potential connectivity with proximal sections of Cork Harbour. Their development and operation could provide in-combination impacts with the proposed development to those screened in European sites.

Name of Plan	Key Issues Directly Linked to Relevant European Sites	Potential Cumulative or In-Combination Impacts on Relevant European Sites
		water quality within Cork Harbour SPA will occur.
Dunkettle Interchange	The proposed provision of an improved interchange at the location of the existing Dunkettle Interchange at the intersection of the N8, the N25 and the N40 in the townland of Dunkettle, Co. Cork.	A Natura Impact Statement (NIS) was prepared for the proposed development as part of the planning application. The NIS found that *inter alia,* the proposed development may potentially impact on the water quality of Cork Harbour SPA. As a result of the appropriate design of the proposed development and proposed mitigation measures, the NIS concluded that the proposed development will have not result in impacts on the integrity of any European Site. As such, assuming that mitigation measures are effectively implemented, no significant adverse cumulative and in-combination impacts with the proposed development on the water quality within Cork Harbour SPA will occur.

5.5 Conclusion of Impact Assessment

The Ballyvolane and Cork Harbour area support a number of local developments and larger infrastructure developments that have been granted planning permission. These developments have been granted planning permission on the basis that targeted and site specific mitigation is completed to minimise potential impacts to Cork Harbour SPA and Great Island Channel SAC. Assuming that best practice construction methods and mitigation measures are effectively implemented for all other developments, then no significant negative cumulative and in-combination impacts on the water quality of Cork Harbour SPA and Great Island Channel SAC are expected.

There is a remote and tenuous connectivity between the proposed residential development and Great Island Channel. The implementation of best practice design, construction and operational measures will negate potential impacts to this European site.

Field drains at the site are culverted to an unnamed watercourse which flows into the Ballincolly River, which confluences with the Glen River, which in turn confluences with the Kiln River before flowing into the River Lee and Cork Harbour SPA. Loss of sediment and release of polluting substances as a result of construction works on site, and control of same, is considered to be the main issue in relation to contribution to negative impacts on water quality within Cork Harbour during the construction phase.

Potential adverse impacts on the water quality of Cork Harbour SPA during the operational phase of the development will be negated by the proposed Sustainable Urban Drainage System; foul water will be treated at Carrigrenan WWTP, which has sufficient capacity for the proposed development. Further, as noted in **Table 5-4**, Objective LAS-01 of the Cobh

Municipal District LAP includes a commitment to the preparation and implementation of a Wastewater Management Strategy for the Cork Harbour Area as per the 2014 County Development Plan. This commitment will address any potential cumulative impacts on the water quality of Cork Harbour from large scale development.

All possible sources of effects from the proposed residential development, in combination with all other sources in the existing environment and any other effects likely to arise from other proposed plans or projects have been identified.

Robust and effective mitigation measures to avoid and or ameliorate these impacts are provided in **Section 6**.

6 Mitigation

As stated in MN2000:

"Mitigation measures may be proposed by the plan or project proponent and/or required by the competent national authorities in order to avoid the potential impacts identified in the appropriate assessment or reduce them to a level where they will no longer adversely affect the site's integrity" (Section 4.6.6).

Potential impacts identified in the above chapters are limited to the deterioration in the water quality of the proposed site's receiving watercourses which support connectivity with Cork Harbour SPA and Great Island Channel SAC during the construction phase. Construction best practice guidance measures and design are provided below to avoid potentially deleterious substances entering receiving watercourses and further downstream to Cork Harbour SPA.

6.1 Construction Phase

6.1.1 General

A preliminary Construction Environment Management Plan (CEMP) has been prepared for the proposed development (MHL, 2019). The Contractor appointed by Longview Developments Ltd. to undertake the construction works shall be responsible for developing and managing the project specific CEMP, incorporating the methodologies described in the preliminary CEMP. The project specific CEMP will detail how implementation of the environmental management and mitigation measures will be monitored by an Ecological Clerk of Works.

The preliminary CEMP details the assignment of responsibility for the implementation of the plan. A set of environmental management procedures is also set out in the CEMP, including an environmental accident, incident and corrective procedure plan. A copy of the preliminary CEMP is included in **Appendix D**.

The control measures for the proposed development will follow the following current best practice guidelines:

- H. Masters-Williams et al (2001) Control of water pollution from construction sites. Guidance for consultants and contractors (C532). CIRIA;
- IFI (2016) *Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters*. Inland Fisheries Ireland, Dublin;
- Murnane *et al* (2002) Control of Water Pollution from Construction Sites- Guide to Good Practice. SP156; and
- Murphy, D. (2004) *Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites*. Eastern Regional Fisheries Board, Dublin.

6.1.2 Control of Surface Water Run-off

The following measures are proposed during the construction phase to mitigate against potential risks to the water quality of the receiving environment:

- The proposed grounding of the 38KV ESB overhead line and subsequent crossing of the watercourse to the west will be carried out in accordance with ESB Networks requirements and will include directional drilling to avoid impact with the watercourse. All necessary measures including protective bunds, temporary bridges and silt fences will be provided by the appointed contractor. Inland Fisheries Ireland will be consulted before any of these works are carried out on-site.

- Surface water runoff from areas stripped of topsoil and surface water collected in excavations will be directed to on-site settlement ponds where effective measures will be implemented to capture and treat sediment laden runoff prior to discharge of surface water at a controlled rate, to the existing watercourse.
- Weather conditions and typical seasonal weather variations will be accounted for when planning the stripping of topsoil and excavations with an objective of minimising soil erosion and protecting the excavated subsoil and rock for re-use on site.
- All spoil/earthworks storage areas (plans of which are included) will be located on well-vegetated lands and will be surrounded by secure silt fencing. It is proposed to use the lands reserved for the school campus as stock-pile areas, in conjunction with existing ditches to create the necessary barriers and sediment ponds to ensure silt run-off is fully controlled.
- If de-watering of earthworks materials is required the resulting water will be pumped out onto well-vegetated areas away from springs, drains or rock outcrops and allowed to run-off into formed settlement ponds prior to discharge to the main drainage system.
- To minimise any impact on the underlying subsurface strata from material spillages, all oils, solvents and paints used during construction will be stored within temporary bunded areas. Oil and fuel storage tanks will be stored in designated areas, and these areas will be bunded to a volume of 110% of the capacity of the largest tank/ container within the bunded area(s) (plus an allowance of 30 mm for rainwater ingress). Drainage from the bunded area(s) will be diverted for collection and safe disposal.
- Refueling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles will take place in a designated area (or where possible off the site) which will be a minimum of 20m away from nearby surface water gulley's or drains. In the event of a machine requiring refueling outside of this area, fuel will be transported in a mobile double skinned tank. An adequate supply of spill kits and hydrocarbon adsorbent packs will be stored in this area. All relevant personnel will be fully trained in the use of this equipment.
- All ready-mixed concrete will be brought to site by truck. A suitable risk assessment for wet concreting will be completed prior to works being carried out which will include measures to prevent discharge of alkaline wastewaters or contaminated storm water to surface water and the underlying subsoil. The pouring of concrete will take place within a designated area using a geo-synthetic material to prevent concrete runoff into surface water and the soil/ groundwater media. Wash down and washout of concrete transporting vehicles will take place at an appropriate facility off site.
- Discharge from any vehicle wheel wash areas will be directed to on-site settlement ponds and will pass through a hydrocarbon interceptor prior to discharge.
- The construction compound will include adequate staff welfare facilities including foul drainage and potable water supply. Foul drainage discharge from the construction compound will be tankered off-site to a licensed facility if necessary, until a connection to the public foul drainage network has been established.
- The construction compound's potable water supply will be protected from contamination by any construction activities or materials in the instance that a temporary well has to be sunk.
- Spill Kits to be kept in designated areas.

6.1.3 Likely Success of Mitigation

The mitigation provided in **Section 6.1.2** is based on best practice measures provided in current best practice pollution prevention guidelines as listed in **Section 6.1.1**. With the

effective implementation of these measures, as monitored by the Ecological Clerk of Works for the project, there is a high level of confidence in their likely success.

6.2 Operational Phase

The proposed development design incorporates standard SuDs features as detailed in **Section 1.3.1**. The foul water will be treated at the Carrigrenan WWTP, which has sufficient capacity for the proposed development.

No significant impacts on European Sites are expected during the operational phase, therefore no specific mitigation measures are required.

7 Analysis and Conclusions

7.1 Integrity of the European Site

From the Assessment of Plans and Projects Significantly Affecting Natura 2000 Sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC (EC, 2002), the meaning of integrity is described as follows;

'*The integrity of the site involves its constitutive characteristics and ecological functions. The decision as to whether it is adversely affected should focus on and be limited to the habitats and species for which the site has been designated and the site's conservation objectives.' (MN2000, Section 4.6.4)*'.

7.2 Integrity of Great Island SAC

Site specific conservation objectives were published in June 2014 for Great Island Channel SAC (NPWS, 2014b). This document provides specific attributes and targets by which the maintenance of favourable conservation condition of qualifying interests within Great Island Channel SAC is measured. The overarching conservation objective for the European sites is as follows:

Objective: To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected (see **Section 3**).

Potential exists for impacts to the QIs of Great Island SAC during the construction phase of the proposed residential development; however these can be readily mitigated through the implementation of mitigation as outlined in **Section 6**.

From the information gathered and the predictions made about the changes that are likely to result from the construction stage of the project and the mitigation measures proposed to avoid impacts to the SAC, the integrity of site checklist is completed for Great Island SAC in **Table 7-1** below.

Table 7-1: Integrity of Site Checklist for Great Island SAC

Conservation Objectives		
Does the project have the potential to:	**Yes or No**	**Comment**
Cause delays in progress towards achieving the conservation objectives of the site?	No	The proposed residential development will not cause delays in achieving the conservation objectives of the site. Potential impacts in the form of water quality deterioration to Cork Harbour and by extension Great Island Channel SAC can be readily mitigated. Required mitigation measures are outlined in Section 6.
Interrupt progress towards achieving the conservation objectives of the site?	No	The proposed residential development will not interrupt progress towards achieving the conservation objectives of the site. Potential impacts in the form of water quality deterioration to Cork Harbour and by extension Great Island Channel SAC can be readily mitigated. Required mitigation measures are outlined in Section 6.
Disrupt those factors that help to maintain the favourable conditions of the site?	No	The proposed residential development will not disrupt those factors that help to maintain the favourable conditions of the site. Potential impacts in the form of water quality deterioration to Cork Harbour and by extension Great Island Channel SAC can be readily

Conservation Objectives		
Does the project have the potential to:	**Yes or No**	**Comment**
		mitigated. Required mitigation measures are outlined in Section 6.
Interfere with the balance, distribution and density of key species that are the indicators of the favourable condition of the site?	No	The proposed residential development will not interfere with the balance, distribution and density of key species that are the indicators of the favourable condition of the site. Potential impacts in the form of water quality deterioration to Cork Harbour and by extension Great Island Channel SAC can be readily mitigated. Required mitigation measures are outlined in Section 6.
Other Indicators		
Does the project or plan have the potential to:		
Cause changes to the vital defining aspects (e.g. nutrient balance) that determine how the site functions as a habitat or ecosystem?	No	Potential impacts in the form of water quality deterioration to Cork Harbour and by extension Great Island Channel SAC can be readily mitigated. Required mitigation measures are outlined in Section 6.
Change the dynamics of the relationships (between, for example, soil and water or plants and animals) that define the structure and/or function of the site?	No	Potential impacts in the form of water quality deterioration to Cork Harbour and by extension Great Island Channel SAC can be readily mitigated. Required mitigation measures are outlined in Section 6.
Interfere with predicted or expected natural changes to the site (such as water dynamics or chemical composition)?	No	Potential impacts may occur through pollution of receiving watercourses and Cork Harbour during the construction phase of the project. Theoretically, this could impact on Annex I habitats associated with Great Island Channel SAC but can be readily mitigated. Required mitigation measures are outlined in Section 6.
Reduce the area of key habitats?	No	There will be no direct loss of key habitats within the Great Island Channel SAC. However, potential indirect impacts may occur through pollution of receiving watercourses during the construction phase but can be readily mitigated. Required mitigation measures are outlined in Section 6.
Reduce the population of key species?	No	There will be no reduction of key species within Great Island Channel SAC.
Change the balance between key species?	No	The proposed residential development will not change the balance between key species associated with Great Island Channel SAC.
Reduce diversity of the site?	No	The proposed residential development will not reduce the diversity of the Great Island Channel. Potential impacts through the deterioration of water quality in Cork Harbour and by extension, the Great Island Channel SAC can be readily mitigated. Required mitigation measures are outlined in Section 6.

Conservation Objectives		
Does the project have the potential to:	**Yes or No**	**Comment**
Result in disturbance that could affect population size or density or the balance between key species?	No	No impacts have been identified that would result in disturbance that could affect population size or density or balance between key species associated with Great Island Channel SAC.
Result in fragmentation?	No	No impacts have been identified that would result in fragmentation of habitats for which the Great Island Channel SAC has been designated.
Result in loss or reduction of key features (e.g. tree cover, tidal exposure, annual flooding, etc.)?	No	No key features associated with the Great Island Channel SAC will be lost as a result of the construction or operation of the proposed development.

7.3 Integrity of Cork Harbour SPA

Site specific Conservation Objectives were published for Cork Harbour SPA in December 2014. This document provides specific attributes and targets by which the maintenance of favourable conservation condition of qualifying interests within Cork Harbour SPA are measured. The overarching conservation objective for the European sites is as follows:

Objective: To maintain or restore the favourable conservation condition of the Special Conservation Interests for which the SPA has been selected (see **Section 3**).

Potential exists for impacts to the SCIs of Cork Harbour SPA during the construction and operation phase of the proposed residential development; however these can be readily mitigated through the implementation of mitigation as outlined in **Section 6**.

From the information gathered and the predictions made about the changes that are likely to result from the construction and operation stages of the project and the mitigation measures proposed to avoid impacts to the SPA, the integrity of site checklist is completed for Cork Harbour SPA in **Table 7-2** below.

Table 7-2: Integrity of Site Checklist for Cork Harbour SPA

Conservation Objectives		
Does the project have the potential to:	**Yes or No**	**Comment**
Cause delays in progress towards achieving the conservation objectives of the site?	No	Potential impacts affecting Cork Harbour SPA will be avoided and will not cause delays in achieving the conservation objectives of the site. Required mitigation measures are outlined in Section 6.
Interrupt progress towards achieving the conservation objectives of the site?	No	Potential impacts affecting Cork Harbour SPA will be avoided and will not interrupt progress in achieving the conservation objectives of the site. Required mitigation measures are outlined in Section 6.
Disrupt those factors that help to maintain the favourable conditions of the site?	No	Factors potentially disrupting the favourable conservation conditions of the site will be restricted through the implementation of mitigation measures. Required mitigation measures are outlined in Section 6.

Conservation Objectives		
Does the project have the potential to:	**Yes or No**	**Comment**
Interfere with the balance, distribution and density of key species that are the indicators of the favourable condition of the site?	No	Potential impacts affecting Cork Harbour SPA such as the deterioration of water quality within receiving watercourses will be minimised through the application of mitigation. Required mitigation measures are outlined in Section 6.
Other Indicators		
Does the project or plan have the potential to:		
Cause changes to the vital defining aspects (e.g. nutrient balance) that determine how the site functions as a habitat or ecosystem?	No	Potential impacts may occur through pollution of receiving watercourses during the construction phase. However these impacts can be effectively mitigated. Required mitigation measures are outlined in Section 6.
Change the dynamics of the relationships (between, for example, soil and water or plants and animals) that define the structure and/or function of the site?	No	Potential impacts may occur through pollution of receiving watercourses during the construction phase. However these impacts can be effectively mitigated. Required mitigation measures are outlined in Section 6.
Interfere with predicted or expected natural changes to the site (such as water dynamics or chemical composition)?	No	Potential impacts may occur through pollution of receiving watercourses during the construction phase. However these impacts can be effectively mitigated. Required mitigation measures are outlined in Section 6.
Reduce the area of key habitats?	No	There will be no direct loss of key habitats associated with Cork Harbour SPA. However, potential indirect impacts may occur through pollution of receiving watercourses during the construction phase. However these impacts can be effectively mitigated. Required mitigation measures are outlined in Section 6.
Reduce the population of key species?	No	There will be no direct impacts to the SCI species for Cork Harbour SPA during the project's construction or operational phase. Indirect impacts may occur due to the deterioration of water quality in receiving watercourses during the project's construction phase. However these impacts can be effectively mitigated. Required mitigation measures are outlined in Section 6.
Change the balance between key species?	No	There will be no direct impacts to the SCI species for Cork Harbour SPA during the construction or operational phase of the project. Indirect impacts may occur due to the deterioration of water quality in receiving watercourses during the project's construction phase. However these impacts can be effectively mitigated. Required mitigation measures are outlined in Section 6.
Reduce diversity of the site?	No	There will be no direct impacts on the SCI species for Cork Harbour SPA during the construction or operational phase of the project. Indirect impacts may occur due to the deterioration of water quality in

Conservation Objectives		
Does the project have the potential to:	**Yes or No**	**Comment**
		receiving watercourses during the project's construction phase. However these impacts can be effectively mitigated. Required mitigation measures are outlined in Section 6.
Result in disturbance that could affect population size or density or the balance between key species?	No	There will be no disturbance impacts on SCI species for Cork Harbour SPA as a result of the proposed residential development.
Result in fragmentation?	No	The proposed residential development will not result in the fragmentation of areas designated as part of Cork Harbour SPA.
Result in loss or reduction of key features (e.g. tree cover, tidal exposure, annual flooding, etc.)?	No	No key features of Cork Harbour SPA, such as intertidal habitats, key feeding or roosting sites will be lost or reduced as a result of construction or operation of the proposed residential development.

7.4 Conclusion

This NIS has been prepared following the Department of the Environment, Heritage and Local Government guidance *'Appropriate Assessment of Plans and Projects in Ireland. Guidance for Planning Authorities*' (DoEHLG, 2010a). The assessment for the proposed Residential Development at Lahardane, Ballyvolane, Co. Cork investigates the potential adverse effects on the qualifying interests of European sites arising from the proposals. The assessment considers whether the residential development works and operation, alone or in combination with other projects or plans, will have adverse effects on the integrity of a European Site, and includes any mitigation measures necessary to avoid, reduce or offset negative effects.

Provided that the mitigation measures recommended in **Section 6** are implemented in full, it can be objectively concluded that the proposed development will not adversely affect the integrity of Great Island Channel SAC or Cork Harbour SPA in view of the sites conservation objectives and that the conservation status of the special conservation interests, qualifying Annex I habitats and Annex II species will not be compromised by the residential development directly, indirectly or cumulatively.

The key considerations that have contributed towards this conclusion are summarised as follows:

- The proposed residential development is not located within lands designated for nature conservation, including Cork Harbour SPA and Great Island Channel SAC. Further, there are no resource requirements (e.g. excavation or abstraction) from European sites for the proposed development. Consequently, none of the lands designated as part of European sites will be directly impacted or removed as a result of the proposed residential development.
- No indirect impacts on the water quality of Cork Harbour SPA or Great Island Channel SAC are expected in relation to sediment or pollution laden surface water run-off during the construction phase due to the requirement for the proposed construction works to adhere to best practice construction guidelines (see **Section 6.1.1**). The construction works will be monitored by an Ecological Clerk of Works.

- The proposed development design incorporates standard SuDs features (as detailed in **Section 1.3.1)**. The foul water will be treated at the Carrigrenan WWTP, which has sufficient capacity for the proposed development. Therefore, no indirect impacts on the water quality of Cork Harbour SPA or Great Island Channel SAC are expected during the operational stage.
- No disturbance or displacement impacts on the SCI of Cork Harbour are expected to occur during the construction or operational phase of the development as the site does not support habitats of ecological significance for SCI of this SPA, further, the proposed site does not overlook this SPA.

The conclusion of this NIS is that with the implementation of best practice and the recommended mitigation measures there will be no potential for direct, indirect or cumulative impacts arising from the proposed Residential Development at Lahardane, Ballyvolane, Co. Cork either alone or in combination with any other plans or projects. The integrity of Great Island Channel SAC or Cork Harbour SPA will not be adversely affected. No reasonable scientific doubt remains as to the absence of such adverse effects.

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Appendix A Screening for Appropriate Assessment Report

Screening for Appropriate Assessment

Proposed Residential Development
Lahardane and Ballincolly,
Ballyvolane
Co. Cork

Final Report, prepared for Longview Estates Ltd

By Karen Banks MCIEEM

14th November, 2019

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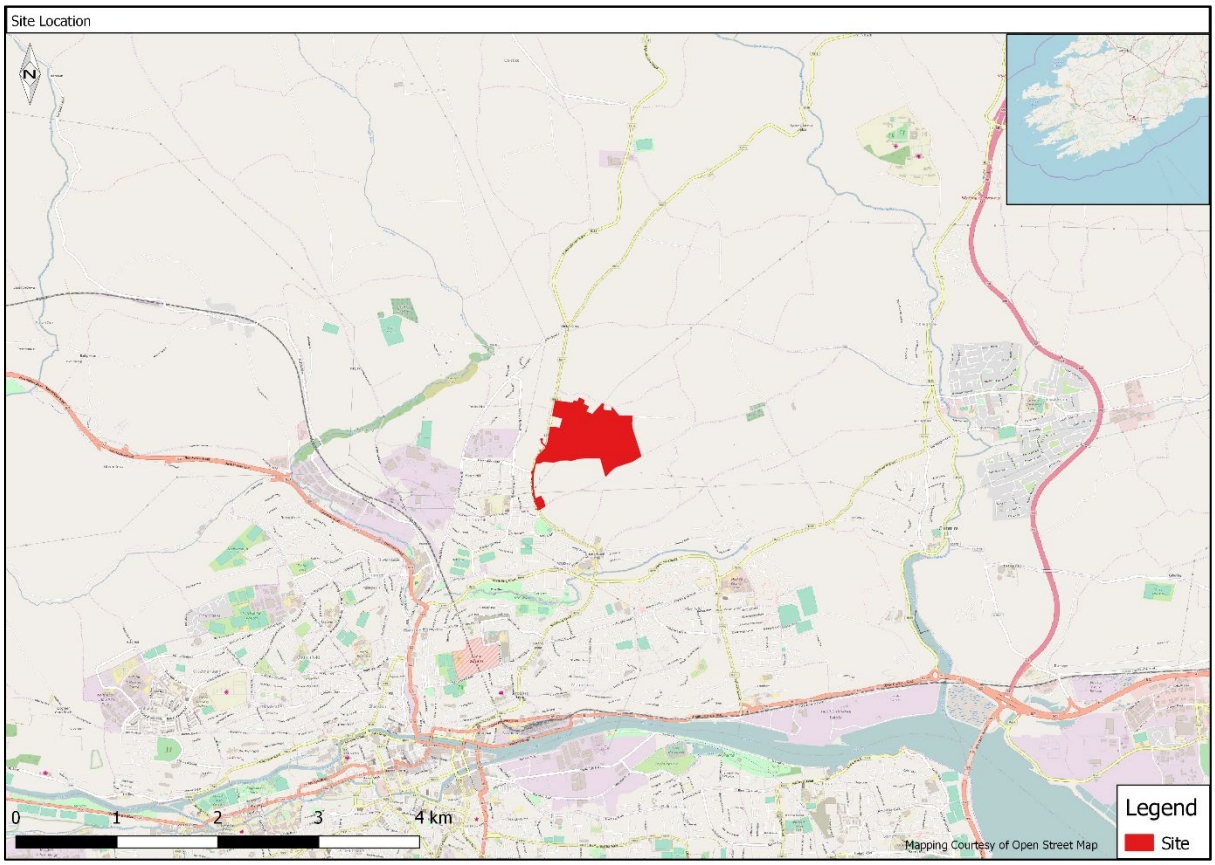
1 Introduction

1.1 Scope of Report

Greenleaf Ecology was commissioned by Cunnane Stratton Reynolds on behalf of Longview Estates Ltd to prepare a Screening for Appropriate Assessment (AA) of a proposed residential development at Lahardane and Ballincolly (Townlands), Ballyvolane, County Cork as depicted in **Figure 1-1** below.

This report comprises information in support of screening for AA to be undertaken by the competent authority in line with the requirements of Article 6(3) of the EU Habitats Directive (Directive 92/43/EEC) on the Conservation of Natural Habitats and of Wild Fauna and Flora; the Planning and Development Act 2000-2019, and the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477/2011) as amended.

Figure 1-1: Site Location Map



1.2 Background and Legislative Context for Appropriate Assessment

The proposed development site is located within the area of the Cobh Municipal District Plan 2017. Within this Plan, the site is located in an area identified as the Cork City North Environs and forms part of a special policy area known as the Ballyvolane Urban Expansion Area. The Northern Environs was identified in the Cork Area Strategic Plan update (2008) as a significant growth location, with Ballyvolane identified as the primary location to accommodate additional growth.

The Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora, better known as “The Habitats Directive”, provides legal protection for habitats and species of European importance. Articles 3 to 9 provide the legislative means to protect

habitats and species of Community interest through the establishment and conservation of an EU-wide network of sites known as Natura 2000.

The Habitats Directive has been transposed into Irish law by Part XAB of the Planning and Development Act, 2000 - 2019 and the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477/2011) as amended. In the context of the proposed development, the governing legislation is the Birds and Habitats Regulations. This Screening has been prepared on behalf of Longview Estates Ltd. An Bord Pleanála is the Competent Authority responsible for undertaking the Screening for AA for this development.

Articles 6(3) and 6(4) of the Habitats Directive set out the decision-making tests for plans and projects likely to adversely affect the integrity of European sites (Annex 1.1). Article 6(3) establishes the requirement for AA:

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

Article 6(4) states:

> *If, in spite of a negative assessment of the implications for the [Natura 2000] site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of a social or economic nature, Member States shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted.*

Natura 2000 sites are defined under the Habitats Directive (Article 3) as a coherent European ecological network of special areas of conservation, composed of sites hosting the natural habitat types listed in Annex I and habitats of the species listed in Annex II, shall enable the natural habitat types and the species' habitats concerned to be maintained or, where appropriate, restored at a favourable conservation status in their natural range. In Ireland, these sites are designated as European sites and include Special Protection Areas (SPAs), established under the EU Birds Directive (79/409/EEC, as codified by 2009/147/EC) for birds and Special Areas of Conservation (SACs), established under the Habitats Directive 92/43/EEC for habitats and species.

The competent authority is obliged to consider, in view of best scientific knowledge, whether the proposed works are likely to have a significant effect either individually or in combination with other plans and projects. If screening determines that there is likely to be significant effects on a European site, then AA must be carried out for the proposed works at Ballyvolane, including the compilation of a Natura Impact Statement (NIS) to inform the decision making.

1.3 Author of Report for Screening for Appropriate Assessment

This AA screening report provides the relevant information on the proposed project to assist the competent authority to screen the project, to determine if an Appropriate Assessment is required and ultimately to make a determination in relation to the likely impact on European sites. This report was prepared by Ms Karen Banks BSc, MCIEEM. Karen is an Ecologist

with Greenleaf Ecology who has 13 years' experience in ecological survey and assessment, including preparation of Screening/NIS's.

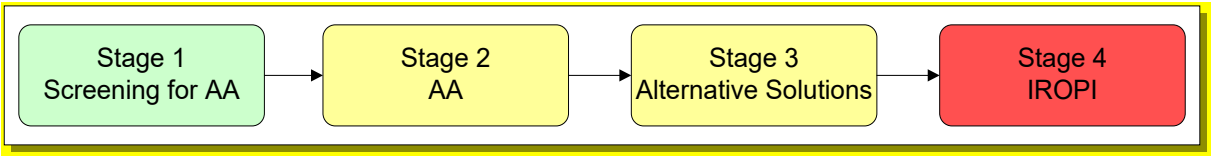
2 Methodology

2.1 Stages of Appropriate Assessment

The Department of the Environment, Heritage and Local Government guidelines (DELHG, 2009, rev. 2010) outlines the European Commission's methodological guidance (EC, 2002) promoting a four-stage process to complete the AA and outlines the issues and tests at each stage. An important aspect of the process is that the outcome at each successive stage determines whether a further stage in the process is required.

The four stages are summarised diagrammatically in **Figure 2-1.** Stages 1-2 deal with the main requirements for assessment under Article 6(3), and Regulation 42 of the Birds and Habitats Regulations. Stage 3 may be part of the Article 6(3) Assessment or may be a necessary precursor to Stage 4. Stage 4 is the main derogation step of Article 6(4).

Figure 2-1: Four Stages of Appropriate Assessment



Stage 1 - Screening is the process that addresses and records the reasoning and conclusions in relation to the first two tests of Article 6(3):

I. whether a plan or project (in this instance the proposed works) is directly connected to or necessary for the management of the European sites, and
II. whether a plan or project, alone or in combination with other plans and projects, is likely to have significant effects on the European sites in view of their conservation objectives.

If the effects are deemed to be significant, potentially significant, or uncertain, or if the screening process becomes overly complicated, then the process must proceed to Stage 2 (AA). This report fulfils the information necessary to enable the competent authority to screen the proposal for the requirement to prepare an AA.

This report forms Stage 1 of the AA process and sets out the following information:

- Description of the proposed works;
- Characteristics of the proximal European sites; and
- Assessment of significance of the proposed works on the European sites in question.

Guidance

The methodology followed in relation to this AA has had regard to the following guidance:

- Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities. Department of Environment, Heritage and Local Government (DoEHLG, 2010);
- Department of Environment Heritage and Local Government Circular NPWS 1/10 and PSSP 2/10 on Appropriate Assessment under Article 6 of the Habitats Directive – Guidance for Planning Authorities (DEHLG, 2010b);
- Communication from the Commission on the Precautionary Principle (EC, 2000), Office for Official Publications of the European Communities, Luxembourg (EC, 2000a);

- Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC (known as MN2000), Office for Official Publications of the European Communities, Luxembourg (EC, 2018);
- Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Articles 6(3) and (4) of the Habitats Directive 92/43/EEC. Office for Official Publications of the European Communities, Brussels (EC, 2001);
- Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC – Clarification of the concepts of: alternative solutions, imperative reasons of overriding public interest, compensatory measures, overall coherence, opinion of the Commission (EC, 2007);
- Nature and biodiversity cases: Ruling of the European Court of Justice (EC, 2006);
- The Planning and Development Act 2000-2019;
- Interpretation Manual of European Union Habitats. Version EUR 28. European Commission (EC, 2013); and
- Article 6 of the Habitats Directive: Rulings of the European Court of Justice (EC, 2014).

2.2 Information Consulted for this Report

The Screening assessment had regard to the following sources of data and information:

- Information on the location, nature and design of the proposed project;
- Department of Housing, Planning, and Local Government – online land use mapping www.myplan.ie/en/index.html;
- Department of Housing, Planning, and Local Government- EIA Portal https://www.housing.gov.ie/planning/environmental-assessment/environmental-impact-assessment-eia/eia-portal
- Environmental Protection Agency (EPA) – Water Quality www.epa.ie, http://gis.epa.ie/Envision;
- Geological Survey of Ireland – Geology, soils and Hydrogeology www.gsi.ie;
- Water Framework Directive website – www.catchments.ie;
- Inland Fisheries Ireland website and www.wfdfish.ie;
- National Parks and Wildlife Service – online European site network information, including site conservation objectives www.npws.ie;
- National Parks and Wildlife Service – Information on the status of EU protected habitats in Ireland (NPWS 2013a, 2013b);
- National Biodiversity Data Centre – www.biodiversityireland.ie; and
- Ordnance Survey of Ireland – Mapping and Aerial photography www.osi.ie.

2.3 Screening Protocol

The sequence of events when completing the AA Screening process is provided below.

2.3.1 Screening Sequence

- Definition of the zone of influence for the proposed works;

- Identification of the European sites that are situated (in their entirety or partially) within the zone of influence of the proposed works;
- Identification of the most up-to-date Qualifying Interests (QIs) for each European site occurring either wholly or partially within the zone of influence;
- Identification of the environmental conditions that maintain the QIs at the desired target of Favourable Conservation Status;
- Identification of the threats/impacts – actual or potential that could negatively impact the environmental conditions of the QIs within the European sites;
- Highlighting the activities of the proposed works that could give rise to significant negative impacts, and
- Identification of other plans or projects, for which In-combination impacts would likely have significant effects.

2.3.2 Screening Determination

In accordance with *Regulation 42(7) of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477/2011)* as amended:-

> *The public authority shall determine that an Appropriate Assessment of a plan or project is not required where the plan or project is not directly connected with or necessary to the management of the site as a European site and if it can be excluded on the basis of objective scientific information following screening under this Regulation, that the plan or project, individually or in combination with other plans or projects, will have a significant effect on a European site*.

Further, under Regulation 42(8)

(a) *Where, in relation to a plan or project for which an application for consent has been received, a public authority makes a determination that an Appropriate Assessment is required, the public authority shall give notice of the determination, including reasons for the determination of the public authority, to the following—*
   (i) the applicant,
   (ii) if appropriate, any person who made submissions or observations in relation to the application to the public authority, or
   (iii) *if appropriate, any party to an appeal or referral.*

Where a public authority has determined that an Appropriate Assessment is required in respect of a proposed development it may direct in the notice issued under subparagraph (a) that a Natura Impact Statement is required.

3 Project Description

The proposed development will consist of a strategic housing development including 753 residential units to be constructed in a series of phases (six neighbourhoods in total), a local centre including retail (2 no. units), a crèche, doctors surgery and community use unit and all associated and ancillary infrastructure, services and site development works.

The proposed 753 no. residential units are comprised of the following:

- 67 no. detached houses including 31 no. 4 bedroom units and 36 no. 3 bedroom units
- 278 no semi-detached houses including 41 no. 4 bedroom units and 237 no. 3 bedroom units
- 186 no. terrace houses including 18 no. 4 bedroom units, 96 no. 3 bedroom units and 72 no. 2 bedroom units
- 69 no. duplexes including 36 no. 3 bedroom units and 33 no. 2 bedroom units
- 153 no. apartments including 6 no. studio apartments, 42 no. 1 bedroom apartments, 79 no. 2 bedroom apartments and 26 no. 3 bedroom apartments. Three apartment blocks will be provided (2 no. in Neighbourhood 6 and 1 no. in Neighbourhood 2)

The proposed development includes a number of open spaces and play areas in addition to general landscaping, boundary treatments (including walls and landscaping to the houses to the north) and lands to the east, and landscaped parkland / greenway. The proposal includes an internal distributor road providing access to neighbouring lands, associated internal roads, car parking, pedestrian and cycle paths (providing access to neighbouring lands), public lighting, internal bus stops and turning area, bin storage (in apartment locations) and cycle parking and all site services infrastructure. The associated site and infrastructural works include water supply, foul and surface / storm water drainage infrastructure to local services and drains and 7 no. unit sub stations.

Two no. vehicular accesses are proposed from the Ballyhooly Road and one no. access to / from the local road to the north of the site (pedestrian access points will also be allowed to the local road to the north), all including local road widening within applicant lands, resurfacing and boundary works. Signalisation of the Lower Dublin Hill / Ballyhooly Road Junction is also proposed along with the provision of a new bus stop on the eastern side of the Ballyhooly Road close to the junction of Lower Dublin Hill and the Ballyhooly Road. The application also provides for the reservation of lands to accommodate the widening of the Ballyhooly Road and the provision of new pedestrian and cyclist infrastructure along the eastern side of the Ballyhooly Road with crossing of same close to Mervue Lawn south of the proposed development.

Groundworks, excavation and ground reprofiling are required and proposed to provide a Distributor Road through the site and all development areas internally within the site. The proposed development also provides for the line diversion and partial undergrounding of the Kilbarry-Flaxfort-Mayfield 38kv line that traverses the landholding east / west, the removal of existing pylons and the provision of two new pylons one in the Lahardane Townland and one in the Ballincolly Townland and landscaping works within the 110 kv power line wayleaves that also traverse the site.

3.1.1 Surface Water

The following features are proposed within the project design:

- The proposed road gradients, road levels, and dwelling finished floor levels (FFL) have been designed to ensure the concentration of surface water run-off in any one location is avoided.
- Each drainage area has been assessed independently of others in terms of allowable run-off rates. SuDS measures are proposed for each neighbourhood, which have not been included for in the sizing of the storm sewer network, reducing the discharge rate to below greenfield run-off rates (QBar). These proposed interception measures

will ensure that the initial 5mm of rainfall is prevented from discharging to the storm network, thereby ensuring the water quality of the receiving watercourse to the west is preserved.
- Surface water runoff on the western side of the site will be attenuated to greenfield runoff rates (Qbar) as agreed with the Drainage Department of Cork City Council.
- SuDS measures in this location will include the use of permeable paving at traffic calmed junctions and the use of planted swales where possible along road edges to provide a primary cleaning of run-off before entering the storm network.
- Surface water discharge rates will be controlled by a Hydrobrake type vortex control device or similar approved, in conjunction with below ground Stormtech attenuation chamber storage, or similar approved.
- Surface water runoff to the eastern side of the site will be routed to buried Stormtech chambers for infiltration into the existing subsoil in-line with site investigation results. This will facilitate the recharge of aquifers in the area whilst limiting the run-off from the overall site to less than the current rate.
- A contract will be entered into with a suitably qualified contractor for the maintenance of the attenuation system including Hydro-brake and the installed hydrocarbon interceptors.

The following methodologies are being implemented as part of the SuDS surface water treatment approach:

- The use of on-site infiltration where feasible (eastern side of the scheme).
- Permeable Paving at suitable locations in and around the retail/crèche area.
- Permeable Paving to be used for junction treatments and tied into storm sewer network in all locations.
- Planted swales along access roads where practical (including tree-pits).
- Attenuation chambers sized to 30 and 100 year return period storms.
- Installation of Hydrobrake vortex control system (limiting surface water discharge from the site to Qbar (5 l/s/ha)).
- Fuel/oil separators will be sized and installed in accordance with permitted discharge from the site for the various phases.
- Attenuation storage design allows for 20% growth of rainfall intensity due to climate change.
- Green Roof attenuation storage provided for in Apartments in neighbourhood 6.

It is proposed to construct two surface water outfalls (Outfall 1 and Outfall 2) to the watercourse running on the western side of Ballyhooly Road. The majority of the site will discharge to Outfall 2, specifically located downstream of an existing culvert under the Kilbarry Link Road.

3.1.2 Foul Water Network

The construction of the foul sewer pipe network shall be in accordance with Irish Water Code of Practice for Wastewater Infrastructure Doc IW-CDS-5030-03.

The proposed development makes provision for two no. pumping stations (and connections to / from same), one in neighbourhood 5 and one adjacent to the Ballyhooly Road, with access, to serve this site and future lands as required by Irish Water. The foul water will be treated at the Carrigrenan WWTP, which has sufficient capacity for the proposed development.

The following indicates how the foul network will develop as the various phases are complete.

Phase 1: Foul network will be gravity fed and will connect to existing 225mm foul sewer running north to south on Ballyhooly Road.

Phase 2: A new strategic pump station is required along Ballyhooly Road to the south of the residential development. This station is required to accommodate additional phases and future developments in the Urban Expansion Area (UEA). The existing foul network has capacity for Phase 1 only. The applicant has entered into a Project Works Service Agreement (PWSA) with IW for the delivery of this infrastructure.

Phase 3: Additional foul network required for Phase 3 housing will be tied into development foul network and be gravity fed to new Irish Water pumping station.

Phase 4: Additional foul network required for Phase 4 housing will be tied into development foul network installed along Ballyhooly Road and be gravity fed to new Irish Water pumping station.

Phase 5: Due to topography constraints, wastewater from Phase 5 will need to be pumped in order to connect to the overall development foul network. A new pumping station will be constructed bordering Phase 5 to achieve this. The rising main from the pumping station will extend north along the main distributor road through the proposed development before tying into the overall development foul network at a location adjacent to Phase 2. Wastewater will then be gravity fed to the new Irish Water pumping station.

Phase 6: Additional foul network required for Phase 6 will be tied into development foul network and be gravity fed to new Irish Water pumping station.

Network extensions will be delivered by Irish Water to service this application and potentially adjacent lands under the provisions of the Water Services Act. These works will include rising mains from the proposed Ballyhooly Rd Pumping Station south along the Ballyhooly Rd to the junction with the North Ring Road at which point it will be routed east along the North Ring Road to a termination point at the Old Youghal Rd Junction. The overall rising mains will include 2400 m of 150mm rising main from the Pumping Station to the Old Youghal Road Junction; a parallel length from the pumping station of 800 m of 250 mm diameter watermain to allow connection / network management by IW including potential connect to existing interceptor sewers; or further extension as required. The rising mains will be routed in public roads (an alternative route is possible in the Glen Park area for the section proposed for the North Ring Road). 250 mm dia foul sewer connecting the housing scheme has been incorporated into the scheme drainage to connect to the Pumping Station proposed on Ballyhooly Road for all phases of housing delivery. This will also capture existing flows from the current 225 mm gravity foul to the north.

3.1.3 Flood Risk

A flood risk assessment for the proposed development has been undertaken (MHL, 2019). As part of the sequential test, the OPW flood hazard maps were consulted, as were the draft Preliminary Catchment Flood Risk Assessment Maps produced by the OPW. Other sources of flood risk were investigated including development drainage. In all cases it was found that the development is at low risk of flooding and the development is deemed appropriate in the proposed site location.

3.2 Existing Environment

3.2.1 Habitats

Ecological surveys of the proposed site were carried out by ecologist Ms. Karen Banks between March 2017 and September 2019.

In summary, the site comprises fields of arable crops (Fossitt Code BC1) bound by hedgerows (WL1), treelines (WL2) and two small wet ditches (FW4). No Annex I habitat was recorded within the proposed site and its immediate environs.

No non-native plant species listed in the Third Schedule[1] were recorded within the proposed site during the site surveys. One small stand of Japanese Knotweed was recorded c.25m outside of the site boundary, to the west of Ballyhooly Road.

3.2.2 Hydrology and Water Quality

There are no streams, rivers or waterbodies located within the site. Two field drains to the west of the site drain to Ballyhooly Road and are then culverted to an unnamed watercourse to the west of Ballyhooly road, which is not included in EPA mapping. This watercourse drains the pasture and arable lands to the west of the proposed site and has been heavily modified so that it runs parallel to Ballyhooly Road.

The unnamed watercourse is included in EPA mapping as the Ballincolly watercourse c.124m to the south west of the proposed pumping station. The Ballincolly is a small first order stream, which is further culverted at Kempton Park for c.0.8km before flowing into the Glen River, a second order watercourse. The Glen River in turn confluences with the Kiln River (a 3rd order watercourse) c.2.2km downstream, before flowing into the River Lee, which is a large 6th order river, a further c.1.0km downstream. The River Lee is part of the Lee Estuary transitional waterbody, which flows into Cork Harbour.

No 'Q-values' are available for these watercourses. The northernmost portion of the site is located within the Glennamought Trib Bride_010 WFD River Sub-basin; the southernmost portion of the site is within the Bride (Cork City)_020 River Sub-basin. The watercourses within the Bride (Cork City) Sub-basin are classified as 'At risk' under the WFD. The transitional water quality of the Lee (Cork) Estuary Lower (IE_SW_060_0900), into which the site ultimately drains, is classified as 'intermediate' and has been assigned as 'at risk' under the WFD.

3.2.3 Soils, Geology and Hydrogeology

The GSI soils map (www.gsi.ie) for the site area indicates that the site and its environs are overlain by Deep well drained mineral (Mainly acidic) soils (AminDW), with an area of Mineral poorly drained (Mainly acidic) soils (AminPD) at the south-west of the site. In regards to bedrock geology, a band of Ballytrasna Formation composed of Purple mudstone and sandstone underlies the majority of the site; a band of Gyleen Formation composed of Sandstone with mudstone & siltstone underlies the south-east corner of the site.

The bedrock units which underlie the site are part of the same Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones. The groundwater vulnerability is described as Extreme.

The proposed site is located within the Ballinhassig East WFD Groundwater Body (IE_SW_G_004), which is classified as being of 'Good' status under the WFD.

3.2.4 Species

Fauna were surveyed through observation of field signs such as direct observation, tracks, feeding signs and droppings. Habitats were assessed for their potential for use, or confirmed use, by protected species of fauna during the site walkover undertaken on 15th March 2017. The results of the site walkover then informed the scope of further taxon specific surveys, which included bat surveys undertaken between July 2017 and September 2019; and badger surveys undertaken between 2017 and 2019. In summary, the proposed site supports foraging soprano and common pipistrelle and Leisler's bat. The proposed site is

[1] Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011)

part of the foraging area of badger and there is limited potential for the hedgerows and treelines at the site to provide shelter for badger.

No Annex II species were recorded at the proposed site.

Bird surveys were undertaken between March 2017 and April 2019 as detailed in the following section.

3.2.4.1 Avifauna

The proposed site is within 2km of the River Bride and its tributary the Glennamought, the Glen River; and tributaries of the Glashaboy River. Further, as detailed in Section 2, the proposed site is located 2.8km from Cork Harbour SPA. Therefore, a number of protected species of birds have been recorded within 2km of the proposed site (http://maps.biodiversityireland.ie). No species of Special Conservation Interest (SCIs) for Cork Harbour SPA were recorded at the proposed site during the site walkovers undertaken in 2017 and 2018 or the specific breeding bird surveys undertaken in July 2017 and April 2019.

A total of twenty species of bird were recorded during the breeding bird surveys within the proposed site. One species of High Conservation Concern (Red listed) was identified during the breeding bird surveys, namely yellowhammer, with 3 pairs of this species recorded during the survey undertaken in April 2019. Five Amber listed species considered to be of Moderate Conservation Concern were recorded during the breeding bird surveys, namely house sparrow, swallow, robin, greenfinch and snipe. The remaining fourteen bird species recorded during the breeding bird surveys are Green listed and comprise a range of relatively common species typically associated with the hedgerow, garden and arable habitats present within, and adjacent to, the footprint of the proposed development. The arable fields and hedgerows, which dominate the proposed site provide some limited nesting to species typical of the intensified agricultural environment. The presence of 3 pairs of Yellowhammer is a noteworthy interest, given this is a Red-listed BOCCI, and breeding is considered probable.

No Annex I species were recorded during the course of the site surveys.

3.3 Description of the European Sites

This stage of the screening for AA process describes European sites within a 15km radius of the proposed works. A 15km buffer zone has been chosen as a precautionary measure, to ensure that all potentially affected European sites are included in the screening process, which is in line with *Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities* (DoEHLG, 2009, rev. 2010). While there may be scientifically appropriate reasons for extending this further afield depending on the source, pathway and receptors of potential impacts, with regard to the current proposal, the 15km distance is considered acceptable to screen all likely significant effects that might impact upon the European sites.

The integrity of a European site (referred to in *Article 6.3* of the EU Habitats Directive) is determined based on the conservation status of the QIs of the SAC or SCIs of the SPA. The QIs/SCIs for each site have been obtained through a review of the Conservation Objectives available from the NPWS website www.npws.ie.

The European sites located within 15km of the proposed works are outlined in **Table 3-1** and **Figure 3-1.** There are 3 European sites located within 15km of the proposed works:

1. Blackwater River (Cork/ Waterford) SAC (002170);
2. Great Island Channel SAC (Site Code: 001058); and

3. Cork Harbour SPA (Site Code: 004030).

Connectivity between the sites and the proposed works has been reviewed. Connectivity is identified via the potential source-pathway-receptor model which identifies the potential impact pathways such as land, air, hydrological, hydrogeological pathways etc. which may support direct or indirect connectivity of the proposed works to European sites and/or their qualifying features.

Source – pathway – receptor dynamics were assessed for European sites 1-3 and it was determined that there is no connectivity (via surface water, groundwater, air or other environmental vectors) between the proposed works and Blackwater River (Cork/ Waterford) SAC. As a result, this site will not be further considered as part of this screening for AA.

Cork Harbour SPA and Great Island Channel SAC support remote and indirect hydrological connectivity to the proposed site. Therefore these sites will be considered further in the below impact assessment.

Table 3-1: International and National Designated Sites within 15km of the Proposed Residential Development

Site Name and Code	**Qualifying Interests**	**Distance from Proposed Site (km)[2]**	**Do any potential source-pathway-receptor links exist between the proposed development and the designated site**
Great Island Channel SAC (001058)[3]	Mudflats and sandflats not covered by seawater at low tide (1140) Atlantic salt meadows (Glauco-Puccinellietalia maritimae) (1330)	6.9km	Field drains at the site drain to an unnamed stream located to the west of Ballyhooly Road. The unnamed stream flows into the Ballincolly River, which ultimately drains into the open waters of Cork Harbour.
Blackwater River (Cork/ Waterford) SAC (002170)[4]	Estuaries [1130] Mudflats and sandflats not covered by seawater at low tide [1140] Perennial vegetation of stony banks [1220] Salicornia and other annuals colonising mud and sand [1310] Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330] Mediterranean salt meadows (Juncetalia maritimi) [1410] Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation [3260]	11.6km	No, due to the distance and absence of hydrological, hydrogeological or habitat connectivity.

[2] Distance measured "as the crow flies"

[3] NPWS (2014) Conservation Objectives: Great Island Channel SAC 001058. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

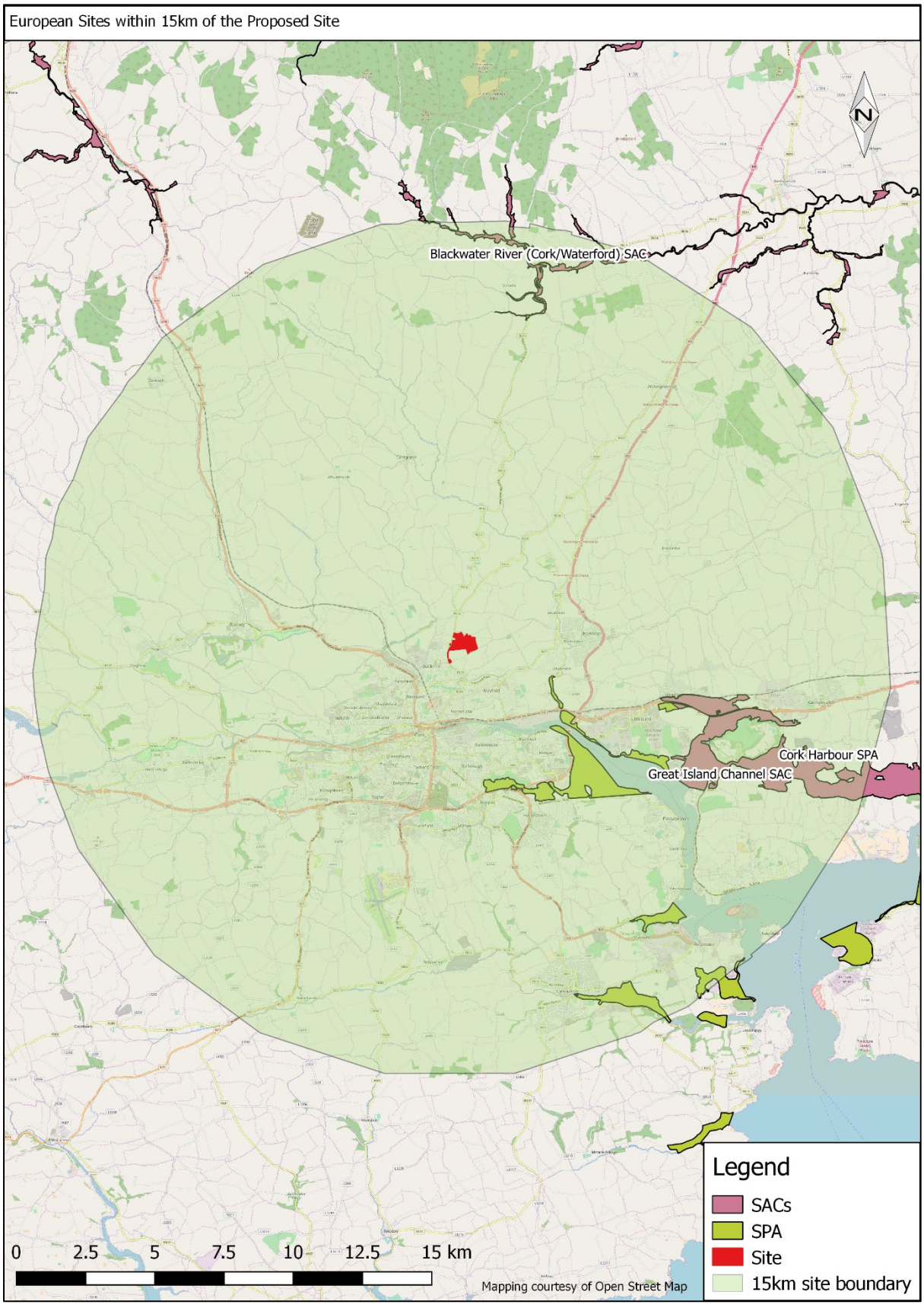
[4] NPWS (2012) Conservation Objectives: Blackwater River (Cork/Waterford) SAC 002170. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

Site Name and Code	Qualifying Interests	Distance from Proposed Site (km)[2]	Do any potential source-pathway-receptor links exist between the proposed development and the designated site
	Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0] Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae) [91E0] *Taxus baccata* woods of the British Isles [91J0]		
Cork Harbour SPA (004030)[5]	Bird Species: Little grebe (*Tachybaptus ruficollis*) [wintering] Great crested Grebe (*Podiceps cristatus*) [wintering] Cormorant (*Phalacrocorax carbo*) [wintering] Grey heron (*Ardea cinerea*) [wintering] Shelduck (*Tadorna tadorna*) [wintering] Wigeon (*Anas penelope*) [wintering] Teal (*Anas crecca*) [wintering] Pintail (*Anas acuta*) [wintering] Shoveler (*Anas clypeata*) [wintering] Red-breasted Merganser (*Mergus serrator*) [wintering] Oystercatcher (*Haematopus ostralegus*) [wintering] Golden Plover (*Pluvialis apricaria*) [wintering] Grey Plover (*Pluvialis squatarola*) [wintering] Lapwing (*Vanellus vanellus*) [wintering] Dunlin (*Calidris alpina*) [wintering] Black-tailed Godwit (*Limosa limosa*) [wintering] Bar-tailed Godwit (*Limosa lapponica*) [wintering] Curlew (*Numenius arquata*) [wintering] Redshank (*Tringa totanus*) [wintering] Black-headed Gull (*Chroicocephalus ridibundus*) [wintering]	2.8km	Field drains at the site drain to an unnamed stream located to the west of Ballyhooly Road. The unnamed stream flows into the Ballincolly River, which ultimately drains into Cork Harbour SPA.

[5] NPWS (2014) Conservation Objectives: Cork Harbour SPA 004030. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

Site Name and Code	Qualifying Interests	Distance from Proposed Site (km)[2]	Do any potential source-pathway-receptor links exist between the proposed development and the designated site
	Common Gull (*Larus canus*) [wintering] Lesser Black-backed Gull (*Larus fuscus*) [wintering] Common Tern (*Sterna hirundo*) [breeding] Wetlands		

Figure 3-1: European Sites within 15km of the Proposed Site



3.3.1 Conservation Objectives

The integrity of a European site (referred to in Article 6.3 of the Habitat's Directive) whether it be a Special Area of Conservation (SAC) or Special Protection Area (SPA) is determined based on the conservation status of the individual qualifying features (QIs or SCIs) of the designated site.

The overarching aim of the Natura 2000 network is to achieve Favourable Conservation Status of conservation worthy habitats listed in Annex I and the habitats of species listed in Annex II of the Habitats Directive and/or of regularly occurring migratory bird species as well as those species defined in Annex I of the Birds Directive. It should be noted that in some situations that there is overlap in extent between certain SACs and SPAs and indeed SAC and SAC. In that regard, the Conservation Objectives (CO's) should be jointly used as appropriate.

The qualifying features for each site have been obtained through a review of the COs available from the NPWS: http://www.npws.ie/protected-sites. Site specific CO's are available for the sites listed in **Table 3-1**; these were accessed in October 2019. For brevity, the site specific CO's are summarised thus:

- To maintain or restore the favourable conservation condition of Annex I habitats and Annex II species for which the SAC has been selected; and
- To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for the SPA.

4 Screening Assessment Criteria

4.1 Individual Elements of the Project Likely to Give Rise to Impacts on the European Sites

Individual elements of the proposed development which may give rise to impacts on European sites are as follows:

- The proposed development is large scale and significant groundworks, excavation and reprofiling will be required during the construction phase. The site drains to a watercourse to the west of the site that supports connectivity to Cork Harbour SPA and, potentially, Great Island Channel SAC.

4.2 Likely Direct, Indirect or Secondary Impacts of the Project on European Sites

The proposed works are not situated within any SACs or SPAs, therefore no direct impacts will occur through land take or fragmentation of habitats.

Field drains to the west of the site drain to Ballyhooly Road and are then culverted to an unnamed watercourse adjacent to the west of Ballyhooly Road. This unnamed watercourse is mapped by the EPA as the Ballincolly watercourse c.124m to the south west of the proposed pumping station. The Ballincolly is a small first order stream, which is further culverted at Kempton Park for c.0.8km before flowing into the Glen River, a second order watercourse. The Glen River in turn confluences with the Kiln River (a 3rd order watercourse) c.2.2km downstream, before flowing into the River Lee, which is a large 6th order river, a further c.1.0km downstream. The River Lee is part of the Lee Estuary transitional waterbody, which flows into Cork Harbour. There is therefore remote and indirect connectivity between the proposed site and Cork Harbour SPA and in turn Great Island Channel SAC via field drains at the site.

There is potential for run-off from the proposed works to the surrounding environment during the construction phase. The potential for likely indirect impacts on Cork Harbour SPA and Great Island Channel SAC is primarily related to the potential for adverse impacts on water quality during the construction phase.

Likely indirect impacts on European sites are described in the following sections.

4.2.1 Size and Scale

The proposed site covers 46.82ha.The proposed project comprises a strategic housing development of 753 residential units (see **Section 3** for project description) to be constructed in a series of phases. The works will include construction of 2 vehicular accesses from Ballyhooly Road and 1 access to / from the local road to the north of the site (pedestrian access points will also be allowed to the local road to the north), all including local road widening within applicant lands, resurfacing and boundary works.

The proposed development is large scale and, as noted previously, will require significant groundworks, excavation and reprofiling during the construction phase. There is potential for run-off from these works to the surrounding environment.

4.2.2 Land Take

The proposed works will not require any land take from any European Site.

4.2.3 Distance from European Sites or Key Features of the Site

The proposed works are located c.2.8km to the north-west of Cork Harbour SPA and c.6.9km north-west of Great Island Channel SAC. The proposed works support connectivity to these European sites via an unnamed watercourse located adjacent to Ballyhooly Road.

4.2.4 Resource Requirements

Excavation of topsoil and subsoil layers will be required in order to allow the construction of the roads network, reprofiling of ground to facilitate the construction of units, foundation excavation, drainage and utility services installation and the provision of underground attenuation/infiltration systems. Excavated materials will be reused as structural fill in the construction of roads and in the general raising of ground levels where required. It is expected that all excavated materials will be reused on site.

Imported materials to site will be natural granular materials sourced from local quarries, which will be used in the construction of road pavement foundations, drainage and services bedding materials and infill material in foundations. Materials brought to site will be placed in their final positions in the shortest possible time to ensure no surplus material results. Any imported material will be kept separate from the on-site excavations. It is estimated that an imported fill requirement of 60,000 m³ will be required (+/-10%) over and above the fill generated on-site. As the proposed construction works are not located within a European site there is no potential for direct impacts to SACs/ SPAs as a result of this resource requirement.

There are no abstraction/ resource requirements from Cork Harbour SPA or Great Island Channel SAC for the proposed works.

Fuel will be consumed by construction equipment. However, this resource requirement is not likely to have a significant effect on European sites.

Regarding resource requirement, no impacts to Cork Harbour SPA and its associated SCIs or Great Island Channel SAC and its QIs are anticipated as a result of the proposed development during the construction or operational phase.

4.2.5 Emissions

There is potential for emissions associated with the proposed works affecting air. Emissions to air will include fine particulate matter associated with ongoing excavations and other construction practices. Dust pollution will also arise from a range of construction practices including excavations, backfilling and concreting, hauling and dumping of earth materials and construction spoils. Such emissions will not impact negatively on the qualifying features of Cork Harbour SPA and Great Island Channel SAC because of the distance between the proposed works and these European sites (c.2.8km and c.6.9km respectively).

The proposed works will also involve the use of hydrocarbons in construction machinery and at compound facilities. There is remote hydrological connectivity between the proposed works and Cork Harbour SPA and Great Island Channel SAC. During the construction phase, there is potential for hydrocarbons to enter the unnamed stream to the west of Ballyhooly Road and in turn Cork Harbour.

Surface water for the development will be treated by the incorporation of a Sustainable Urban Drainage System, including attenuation, storm water soakpits and hydrocarbon interceptors (see **Section 3.1.1**). Foul water will be sent to Carrigrenan WWTP, which has sufficient capacity for the proposed development. Therefore, it is considered that there will be no significant effects on designated sites as a result of emissions during the operational phase of the proposed development.

4.2.6 Excavation Requirements

Excavation of soil, subsoil and bedrock layers will be required in order to allow the construction of the roads network, reprofiling of ground to facilitate the construction of units,

foundation excavation, drainage and utility services installation and the provision of underground attenuation/infiltration systems.

In the absence of protective measures, indirect impacts may arise from the excavation and stockpiling of earth and construction material (sand, gravel, etc.) during the construction phase of the proposed development. Excavation and ground disturbance during the construction phase could potentially lead to suspended solids runoff into drainage systems adjacent to the site and eventually into Cork Harbour SPA and Great Island Channel SAC.

4.2.7 Transport Requirements

The construction phase of the proposed works will require earthworks plant (e.g. dump trucks, excavators) and vehicles delivering construction materials to site (e.g. road aggregates, concrete deliveries, HGV's carrying prefabricated members etc.).There is potential for a range of pollutants to enter the unnamed stream to the west of Ballyhooly Road and in turn Cork Harbour during construction work and the transportation of materials to and from the construction site during the construction phase.

No significant impacts on European sites due to transport requirements will occur during the operational phase.

4.2.8 Duration of Construction, Operation and Decommissioning

The proposed development will be constructed in 6 phases over an estimated time period of 9 years.

4.2.9 Cumulative/ In-Combination Impacts

It is a requirement of Appropriate Assessment that the cumulative or in-combination effects of the proposed development together with other Plans or projects are assessed. Cumulative impacts can result from the successive, incremental, and/or combined effects of a development (plan, project or activity) when added to other existing, planned, and/or reasonably anticipated developments.

A search of the Cork City planning enquiry system[6], My Plan[7] and the EIA Portal[8] was conducted for developments that may have in-combination effects on European sites with the proposed residential development. The search included developments that are proximal to the proposed site and those that may have an adverse cumulative or in-combination impact with the proposals on the water quality of Cork Harbour.

Plans relevant to the area were searched in order to identify any elements of the plans that may act cumulatively or in-combination with the proposed development.

A list of those projects and Plans which may potentially contribute to cumulative or in-combination Impacts with the proposed residential development was generated for as listed in **Table 4-1** below.

Table 4-1: List of Potential Projects and Plans which may Contribute to Cumulative Impacts

Name of Plan	Key Issues Directly Linked to Relevant European Sites	Potential Cumulative or In-Combination Impacts on Relevant European Sites
Cobh Municipal District Plan (MDP) 2017	The MDP includes the following Objectives of relevance to the proposed site:	The policies and objectives of the MDP will ensure that local planning applications comply

[6] http://planenquiry.corkcity.ie/planningenquiry/

[7] https://myplan.ie/

[8] https://www.housing.gov.ie/planning/environmental-assessment/environmental-impact-assessment-eia/eia-portal

Name of Plan	Key Issues Directly Linked to Relevant European Sites	Potential Cumulative or In-Combination Impacts on Relevant European Sites
	General Development Objectives for Cork City North Environs. LAS-01: The Council is committed to the preparation and implementation of a Wastewater Management Strategy for the Cork Harbour Area as per the 2014 County Development Plan. NE-GO-02: In order to secure the sustainable population growth and supporting development proposed in NE-GO-01, appropriate and sustainable water and waste water infrastructure that will secure the objectives of the relevant River Basin Management Plan must be provided and be operational in advance of the commencement of any discharges from the development. Waste water infrastructure must be capable of treating discharges to ensure that water quality in the receiving harbour does not fall below legally required levels. NE-GO-06: Design an integrated approach to surface water management which considers land use, water quality, amenity and habitat enhancements, thereby replicating the current greenfield rate of surface water runoff, post development, to prevent flooding of lands and settlements downstream. A Sustainable Urban Drainage Strategy should be completed for the site prior to development. NE-GO-07: Create an ecological network by linking green areas to allow for movement of wildlife. All environmental resources should be incorporated from waterways to woodlands to adopt a green infrastructure approach within the site with links to the surrounding countryside. Open space for public recreation including the provision of playing pitches, amenity walks, children's playground, open parkland, subject to appropriate scaling and siting.	with proper planning and sustainability and with the requirements of relevant EU Directives and environmental considerations; there is no potential for adverse in-combination effects on European Sites.
Cork County Development Plan 2014-2020	The policies and objectives of this plan are intended to contribute to the delivery of a number of key aims for the county as a whole. They are as follows: • Enhanced quality of life for all • Sustainable patterns of growth in urban and • rural areas • Sustainable and balanced economic investment • An effective physical and community	Policies and objectives of the Cork County Development Plan 2014 – 2020 ensure that local planning applications comply with proper planning and sustainability and with the requirements of relevant EU Directives and environmental considerations, there is no potential for adverse in-combination effects on European Sites.

Name of Plan	Key Issues Directly Linked to Relevant European Sites	Potential Cumulative or In-Combination Impacts on Relevant European Sites
	• Infrastructure • A quality built environment • A network of enhanced natural resources • Responsible guardianship of the County	
Pumping Station	The proposed development includes the provision of two pumping stations. One Type 3 Pumping Station for local services in neighbourhood 5 is provided. Foul waste collected by this Pumping Station will then be transferred to the main proposed pumping station on Ballyhooly Road which forms part of the planning application. This Pumping Station with access to the Ballyhooly Road to accommodate this site and future lands in the area can be constructed on a phased basis as it is a three chamber design.	A full assessment of the potential ecological impacts associated with the pumping station as part of the proposal has been carried out. The associated rising main route has been identified and pipe sizes identified. Delivery of the rising main will include the appropriate research and survey work necessary in order to inform a robust assessment of the potential impacts associated with the proposed works on European Sites within the Zone of Influence of the works. In consideration of this requirement, no adverse cumulative or in-combination impacts with the proposed development works at Ballyvolane on European sites are anticipated.
Local Planning Applications[9]	Various local planning applications in proximity and within the Zone of Influence of the proposed residential development. These include a 20 unit residential development at Banduff Road, Banduff (Ref: 19/5326), 74 unit residential development in Ballincrokig (Ref: 17/6781), demolition of Lidl foodstore and construction of new foodstore with associated site works (Ref: 16/5477); and small scale domestic dwelling construction, extensions to domestic dwellings and public buildings and permission and retention permission for commercial development at Ballyvolane.	Adherence to the overarching policies and objectives of the Cork County Development Plan 2015 - 2020 ensure that local planning applications and subsequent grant of planning comply with the core strategy of proper planning and sustainability and with the requirements of relevant EU Directives and environmental considerations, there is no potential for significant adverse in combination effects on European Sites.
Redevelopment of Custom House, Cork City (Ref: 1938589)	Redevelopment of the Custom House site at North Custom House Quay and South Custom House Quay, Cork City, to provide a 240 bedroom hotel, 25 hotel serviced suites and a range of commercial uses.	A Natura Impact Statement (NIS) was prepared for the proposed development as part of the planning application. The potential for sediment laden run-off and pollutants to have an adverse impact on the

[9] The Local Planning Applications included in this potential in-combination impacts assessment support the following criteria: planning applications granted within the past five years that may contribute to potential cumulative impacts on European sites of concern. They include planning applications that support proximity or potential connectivity with proximal sections of Cork Harbour. Their development and operation could provide in-combination impacts with the proposed development to those screened in European sites.

Name of Plan	Key Issues Directly Linked to Relevant European Sites	Potential Cumulative or In-Combination Impacts on Relevant European Sites
		water quality of Cork Harbour SPA and Great Island Channel SAC was identified. However, the NIS concluded that the mitigation measures provided in the NIS report will ensure that any effects on the conservation objectives of European sites will be avoided and that the construction and operation of the proposed development will not pose a risk of adversely affecting (either directly or indirectly) the integrity any European site, either alone or in combination with other plans or projects. As such, assuming that mitigation measures are effectively implemented, no significant adverse cumulative and in-combination impacts with the proposed development on the water quality within Cork Harbour SPA will occur.
Dunkettle Interchange	The proposed provision of an improved interchange at the location of the existing Dunkettle Interchange at the intersection of the N8, the N25 and the N40 in the townland of Dunkettle, Co. Cork.	A Natura Impact Statement (NIS) was prepared for the proposed development as part of the planning application. The NIS found that *inter alia,* the proposed development may potentially impact on the water quality of Cork Harbour SPA. As a result of the appropriate design of the proposed development and proposed mitigation measures, the NIS concluded that the proposed development will have not result in impacts on the integrity of any European Site. As such, assuming that mitigation measures are effectively implemented, no significant adverse cumulative and in-combination impacts with the proposed development on the water quality within Cork Harbour SPA will occur.

4.2.10 Likely Changes to the Site

4.2.10.1 Reduction of Habitat Area

The proposed works are not located within a European site, or in close proximity to a European site. Therefore there is no potential for reduction in designated habitats or habitats within close proximity to Cork Harbour SPA and Great Island Channel SAC.

4.2.10.2 Disturbance to Key Species

Cork Harbour SPA is of special conservation interest for wetlands and waterbirds. The proposed site is predominantly comprised of arable fields bound by hedgerows. There are no significant waterbodies or watercourses present at the site and its immediate environs and, as such, would not be favoured by the Qualifying Interests of Cork Harbour SPA. Bird species observed during the site surveys conducted between 2017 and 2019 comprised species that reflect the habitat assemblages present at the site, i.e. agricultural land with hedgerows. No wildfowl or waterbirds were observed at the site. In consideration of the aforementioned factors, it is considered that any disturbance or ex-situ impacts to the qualifying interests of Cork Harbour SPA as a result of the proposed development is extremely unlikely. The qualifying interests of Great Island Channel are habitats, not species, therefore ex-situ disturbance impacts are not applicable to this European Site.

The proposed site is located c.2.8km north-west of Cork Harbour SPA. In view of the distance between the proposed site and Cork Harbour SPA, there will be no visual disturbance to birds within Cork Harbour SPA during the construction or operational phase.

4.2.10.3 Habitat or Species Fragmentation

Construction activities can result in the spread of invasive non-native species. However, no non-native plant species listed in the Third Schedule[10] were recorded within the proposed site during the site surveys. One small stand of Japanese Knotweed was recorded c.25m outside of the site boundary, to the west of Ballyhooly Road. A treatment programme for this stand of Japanese Knotweed commenced in 2019. There will be no disturbance to Japanese Knotweed during the construction or operational phase; no works are proposed within a 7m radius of the area where Japanese Knotweed is present. Therefore, there will be no habitat loss or fragmentation impacts on downstream European sites as a result of spread of invasive species during the construction or operational phase.

The proposed construction phase works will not result in habitat or species fragmentation to European sites. Likewise, the operation phase will not result in habitat or species fragmentation of European sites.

4.2.10.4 Reduction in Species Density or Diversity

There is potential for surface water emissions from activities such as excavation, use of concrete, accidental spillage of deleterious substances etc. (as detailed in **Section 4.2.1** to **Section 4.2.7**) to reach the unnamed watercourse to the west of Ballyhooly Road and eventually Cork Harbour SPA and, potentially, Great Island Channel SAC. The proposed development is large scale with an estimated construction phase duration of 9 years. In view of the size and scale of the proposed development, the potential for the proposed works to have a deleterious impact on water quality, a toxic effect on aquatic organisms and in turn a reduction in available prey species for the SCI for Cork Harbour SPA during the construction phase cannot be excluded.

[10] Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011)

Surface water for the development will be treated by the incorporation of a Sustainable Urban Drainage System, including attenuation, storm water soakpits and hydrocarbon interceptors (see **Section 3.1.1**). Foul water will be sent to Carrigrenan WWTP, which has sufficient capacity for the proposed development. Therefore, it is considered that there will be no significant effects on designated sites as a result of a reduction in water quality and in turn a reduction in available prey species during the operational phase of the proposed development.

4.2.10.5 Changes in Key Indicators of Conservation Value

There is no direct hydrological connectivity between the proposed site and Cork Harbour SPA and Great Island Channel SAC. In consideration of the lack of direct hydrological links between the proposed site and Cork Harbour, there will be no direct discharges to surface water within Cork Harbour from the site.

However, as detailed previously, there is a remote and indirect connectivity between the proposed works and Cork Harbour SPA and in turn Great Island Channel SAC. In the absence of protective measures, indirect impacts may arise from the excavation and stockpiling of earth and construction material (sand, gravel, etc.) and concrete pouring during the construction phase of the proposed development. Excavation and ground disturbance during the construction phase could potentially lead to suspended solids runoff into drainage systems adjacent to the site and eventually into Cork Harbour SPA and Great Island Channel SAC. There is also potential for a range of pollutants to enter the unnamed watercourse to the west of Ballyhooly Road and in turn Cork Harbour during construction work and the transportation of materials to and from the construction site.

There is potential for the proposed residential development to contribute to adverse impacts on water quality in Cork Harbour, and hence Cork Harbour SPA and Great Island Channel SAC, during the operational phase of the proposed development as a result of surface water and waste water discharges from the development. However, surface water for the development will be treated by the incorporation of a Sustainable Urban Drainage System, including attenuation, storm water soakpits and hydrocarbon interceptors (see **Section 3.1.1**). Foul water will be sent to Carrigrenan WWTP, which has sufficient capacity for the proposed development. Therefore, it is considered that there will be no significant adverse impacts on the water quality of Cork Harbour during the operational phase of the proposed development.

4.2.11 Likely Impacts on the European Sites

Interference with key relationships that define the structure and function of the site

No disturbance or displacement impacts on the SCI of Cork Harbour are expected to occur during the construction or operational phase of the development. The main risk is run-off of construction phase pollutants into the receiving watercourse to the west of Ballyhooly Road, which eventually drains to Cork Harbour SPA, which in turn provides a tenuous link to Great Island Channel SAC. The potential for a reduction in water quality to have a toxic effect on aquatic organisms and a reduction in prey species available for the SCI species of Cork Harbour SPA cannot be excluded. Indirect impacts to Great Island Channel SAC as a result of deterioration in water quality to Cork Harbour may impact upon the Annex I coastal habitats for which this European site is designated.

4.2.12 Indicators of Significance as a result of the identification of effects

Loss
No loss of designated European sites will occur as a result of the construction or operation of the proposed project.

Fragmentation
There will be no fragmentation of European sites associated with the construction or operation of the proposed project.

Disruption
Given the location of the works, there will be no disruption effects to European sites during the construction or operation of the proposed project.

Disturbance
As outlined previously, no disturbance impacts on the SCI of Cork Harbour are expected to occur during the construction or operational phase of the proposed project.

Change to Key Elements of the Site
There is potential for adverse impacts on the water quality within Cork Harbour SPA and Great Island Channel SAC during the construction phase. The potential for a reduction in water quality to have a toxic effect on aquatic organisms and a reduction in prey species available for the SCI species of Cork Harbour SPA cannot be excluded. Indirect impacts to Great Island Channel SAC as a result of deterioration in water quality to Cork Harbour may impact upon the Annex I coastal habitats for which this European site is designated.

Likely Significant Impacts.
The potential impacts of the proposed construction works have been assessed. No disturbance or displacement impacts on SCI species are expected to arise from the proposed works. There is potential for adverse impacts on the water quality within Cork Harbour SPA and Great Island Channel SAC during the construction phase. The potential for a reduction in water quality to have a toxic effect on aquatic organisms and a reduction in prey species available for the SCI species of Cork Harbour SPA cannot be excluded. Indirect impacts to Great Island Channel SAC as a result of deterioration in water quality to Cork Harbour may impact upon the Annex I coastal habitats for which this European site is designated.

No potential significant effects on European sites during the operation phase have been identified.

Additional plans and projects identified for the region and study area are detailed in **Table 4-1**. It is concluded that no significant in-combination effects are considered likely.

5 Screening Conclusions and Statement

This AA screening report has been prepared to assess whether the proposed development, individually or in-combination with other plans or projects, and in view of best scientific knowledge, is likely to have a significant effect on any European site(s).

The screening exercise was completed in compliance with the relevant European Commission guidance, national guidance, and case law. The potential impacts of the proposed development have been considered in the context of the European sites potentially affected, their qualifying interests or special conservation interests, and their conservation objectives.

Through an assessment of the source-pathway-receptor model, which considered the ZoI of effects from the proposed development and the potential in-combination effects with other plans or projects, the following findings were reported:

- In the absence of mitigation measures to control surface water pollution during the construction of the proposed development, the potential for significant effects to Cork Harbour SPA and Great Island Channel SAC cannot be ruled out.

In view of objective information, best scientific knowledge and the conservation objectives of the European Sites, the potential for likely significant effects to Cork Harbour SPA and Great Island Channel SAC sites cannot be excluded.

Likely significant effects (in the absence of mitigation) to these European Sites arise primarily from the potential for water quality degradation as a result of the proposed works which, in turn, has the possibility to affect the conservation objectives of the European Sites alone or in combination with other plans or projects.

It is acknowledged that An Bord Pleanála as the competent authority shall make the determination whether AA is required.

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Appendix B Great Island Channel SAC Site Documentation

ISSN 2009-4086

National Parks and Wildlife Service

Conservation Objectives Series

Great Island Channel SAC 001058

An Roinn
Ealaíon, Oidhreachta agus Gaeltachta
Department of
Arts, Heritage and the Gaeltacht

National Parks and Wildlife Service,
Department of Arts, Heritage and the Gaeltacht,

7 Ely Place, Dublin 2, Ireland.

Web: www.npws.ie
E-mail: nature.conservation@ahg.gov.ie

Citation:

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Series Editor: Rebecca Jeffrey
ISSN 2009-4086

Introduction

The overall aim of the Habitats Directive is to maintain or restore the favourable conservation status of habitats and species of community interest. These habitats and species are listed in the Habitats and Birds Directives and Special Areas of Conservation and Special Protection Areas are designated to afford protection to the most vulnerable of them. These two designations are collectively known as the Natura 2000 network.

European and national legislation places a collective obligation on Ireland and its citizens to maintain habitats and species in the Natura 2000 network at favourable conservation condition. The Government and its agencies are responsible for the implementation and enforcement of regulations that will ensure the ecological integrity of these sites.

A site-specific conservation objective aims to define favourable conservation condition for a particular habitat or species at that site.

The maintenance of habitats and species within Natura 2000 sites at favourable conservation condition will contribute to the overall maintenance of favourable conservation status of those habitats and species at a national level.

Favourable conservation status of a habitat is achieved when:

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

The favourable conservation status of a species is achieved when:

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

Notes/Guidelines:

1. The targets given in these conservation objectives are based on best available information at the time of writing. As more information becomes available, targets for attributes may change. These will be updated periodically, as necessary.
2. An appropriate assessment based on these conservation objectives will remain valid even if the targets are subsequently updated, providing they were the most recent objectives available when the assessment was carried out. It is essential that the date and version are included when objectives are cited.
3. Assessments cannot consider an attribute in isolation from the others listed for that habitat or species, or for other habitats and species listed for that site. A plan or project with an apparently small impact on one attribute may have a significant impact on another.
4. Please note that the maps included in this document do not necessarily show the entire extent of the habitats and species for which the site is listed. This should be borne in mind when appropriate assessments are being carried out.
5. When using these objectives, it is essential that the relevant backing/supporting documents are consulted, particularly where instructed in the targets or notes for a particular attribute.

Qualifying Interests

**** indicates a priority habitat under the Habitats Directive***

001058	Great Island Channel SAC
1140	Mudflats and sandflats not covered by seawater at low tide
1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)

Please note that this SAC overlaps with Cork Harbour SPA (004030). See map 2. The conservation objectives for this site should be used in conjunction with those for the overlapping site as appropriate.

Supporting documents, relevant reports & publications

Supporting documents, NPWS reports and publications are available for download from: www.npws.ie/Publications

NPWS Documents

Year :	2006
Title :	A survey of intertidal mudflats and sandflats in Ireland
Author :	Aquafact
Series :	Unpublished report to NPWS
Year :	2009
Title :	Saltmarsh monitoring project 2007-2008
Author :	McCorry, M.; Ryle, T.
Series :	Unpublished report to NPWS
Year :	2014
Title :	Great Island Channel SAC (site code:1058) Conservation objectives supporting document-coastal habitats V1
Author :	NPWS
Series :	Conservation objectives supporting document
Year :	2014
Title :	Great Island Channel SAC (site code:1058) Conservation objectives supporting document-marine habitats V1
Author :	NPWS
Series :	Conservation objectives supporting document

Other References

Year :	1998
Title :	The saltmarshes of Ireland: an inventory and account of their geographical variation
Author :	Curtis, T.G.F.; Sheehy Skeffington, M.J.
Series :	Biology and Environment, Proceedings of the Royal Irish Academy 98B: 87-104
Year :	2012
Title :	Benthic sampling of water bodies of County Cork under the Water Framework Directive
Author :	EcoServe
Series :	Report to the Marine Institute
Year :	2012
Title :	Intertidal benthic survey of Great Island Channel SAC and Cork Harbour SPA
Author :	MERC
Series :	Unpublished report to the Marine Institute and NPWS

Spatial data sources

Year :	Interpolated 2014
Title :	Intertidal surveys 2006, 2011; subtidal survey 2011
GIS Operations :	Polygon feature classes from marine community types base data sub-divided based on interpolation of marine survey data. Expert opinion used as necessary to resolve any issues arising
Used For :	1140, Marine community types (maps 3 and 4)
Year :	2005
Title :	OSi Discovery series vector data
GIS Operations :	High water mark (HWM) and low water mark (LWM) polyline feature classes converted into polygon feature classes and combined; EU Annex I Saltmarsh and Coastal data erased out if present
Used For :	Marine community types base data (map 4)
Year :	Revision 2010
Title :	Saltmarsh Monitoring Project 2007-2008. Version 1
GIS Operations :	QIs selected; clipped to SAC boundary; overlapping regions with Coastal CO data investigated and resolved with expert opinion used
Used For :	1330 (map 5)

1140 Mudflats and sandflats not covered by seawater at low tide

To maintain the favourable conservation condition of Mudflats and sandflats not covered by seawater at low tide in Great Island Channel SAC, which is defined by the following list of attributes and targets:

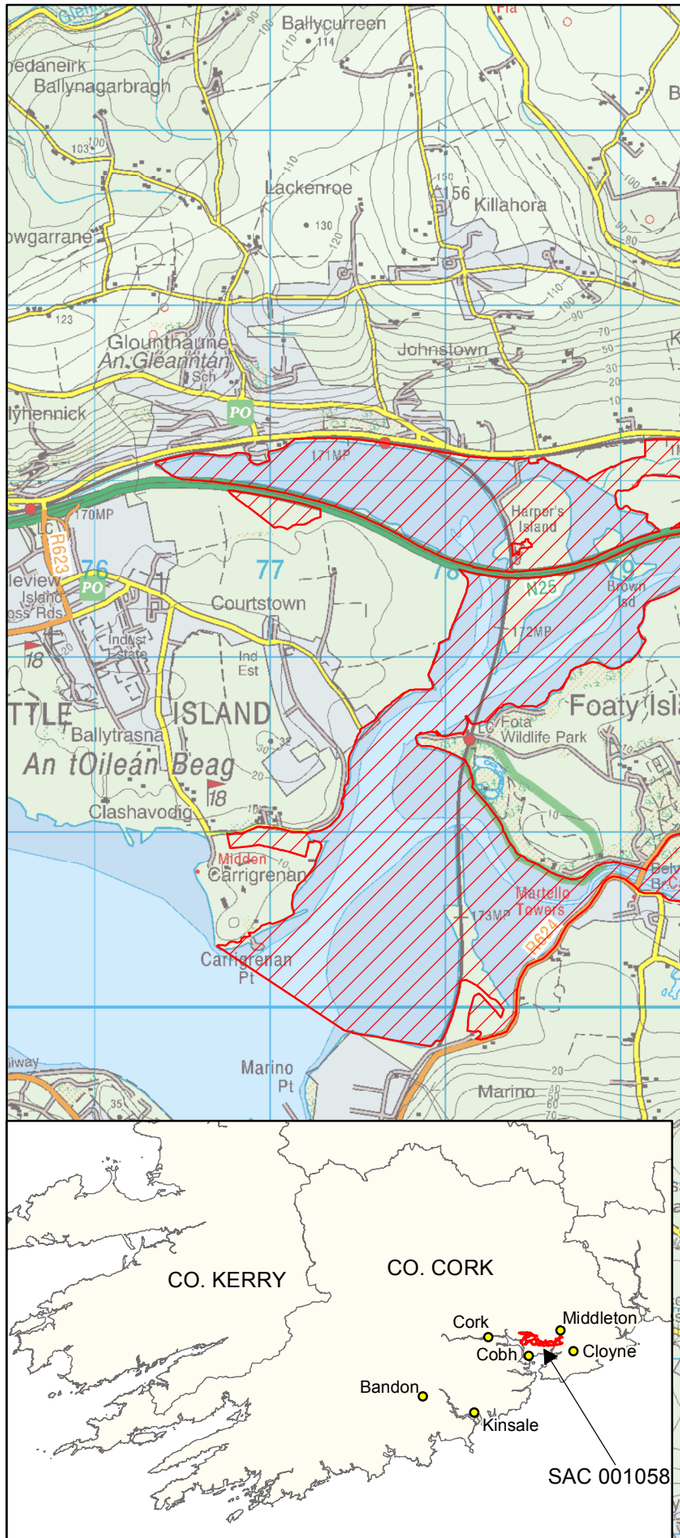
Attribute	Measure	Target	Notes
Habitat area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes. See map 3	Habitat area was estimated using as 723ha using OSi data
Community distribution	Hectares	Conserve the following community type in a natural condition: Mixed sediment to sandy mud with polychaetes and oligochaetes community complex. See map 4	Based on intertidal and subtidal surveys undertaken in 2006 (Aquafact, 2007) and 2011 (EcoServe, 2012; MERC, 2012). See marine supporting document for further information

1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimae)

To restore the favourable conservation condition of Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) in Great Island Channel SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession. For sub-sites mapped: Bawnard - 0.29ha; Carrigatohil - 1.01ha. See map 5	Based on data from Saltmarsh Monitoring Project (SMP) (McCorry and Ryle, 2009). Two sub-sites that supported Atlantic salt meadow were mapped (1.30ha) and additional areas of potential saltmarsh (17.60ha) were identified from an examination of aerial photographs, giving a total estimated area of 18.90ha. Saltmarsh habitat has also been recorded at two other sub-sites within the SAC (Curtis and Sheehy Skeffington, 1998). NB further unsurveyed areas maybe present within the SAC. See coastal habitats supporting document for further details
Habitat distribution	Occurrence	No decline or change in habitat distribution, subject to natural processes. See map 5 for known distribution	Based on data from McCorry and Ryle (2009). Within the sites surveyed by the SMP, estuary type saltmarsh over a mud substrate is most common and ASM is the dominant saltmarsh habitat. NB further unsurveyed areas maybe present within the SAC. See coastal habitats supporting document for further details
Physical structure: sediment supply	Presence/ absence of physical barriers	Maintain/restore natural circulation of sediments and organic matter, without any physical obstructions	Based on data from McCorry and Ryle (2009). At Bawnard there is a seawall that was constructed in the 18th-19th centuries. At Carrigatohil the northern and eastern shorelines have been significantly modified by road construction. Part of the saltmarsh has also been infilled. See coastal habitats supporting document for further details
Physical structure: creeks and pans	Occurrence	Maintain/restore creek and pan structure, subject to natural processes, including erosion and succession	Based on data from McCorry and Ryle (2009). The ASM at Carrigatohil is poorly developed, though some of the larger sections contain salt pans. The smaller sections, however, tend to be quite uniform in topography. The saltmarsh topography at Bawnard is poorly developed with few typical saltmarsh features. See coastal habitats supporting document for further details
Physical structure: flooding regime	Hectares flooded; frequency	Maintain natural tidal regime	Based on data from McCorry and Ryle (2009). At Bawnard, the entire bay empties at low tide to expose soft intertidal mudflats. See coastal habitats supporting document for further details
Vegetation structure: zonation	Occurrence	Maintain range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	Based on data from McCorry and Ryle (2009). Zonations to *Salicornia* flats and intertidal mudflats occurs at Carrigatohil. At Bawnard, there is succession from saltmarsh to brackish saltmarsh and wet grassland as well as zonation to intertidal mudflats at the lower saltmarsh boundary. See coastal habitats supporting document for further details
Vegetation structure: vegetation height	Centimetres	Maintain structural variation within sward	Based on data from McCorry and Ryle (2009). At Carrigatohil, the sward height is quite tall due to lack of grazing. At Bawnard only part of the site is grazed. See coastal habitats supporting document for further details
Vegetation structure: vegetation cover	Percentage cover at a representative number of monitoring stops	Maintain more than 90% area outside creeks vegetated	Based on data from McCorry and Ryle (2009). Some poaching was noted in places at Bawnard. See coastal habitats supporting document for further details
Vegetation composition: typical species and sub-communities	Percentage cover at a representative number of monitoring stops	Maintain range of sub-communities with typical species listed in SMP (McCorry and Ryle, 2009)	See coastal habitats supporting document for further details

Vegetation structure: negative indicator species - *Spartina anglica*	Hectares	No significant expansion of common cordgrass (*Spartina anglica*), with an annual spread of less than 1% where it is known to occur	Based on data from McCorry and Ryle (2009). *Spartina* occurs at both sub-sites in this SAC. See coastal habitats supporting document for further details



Legend

Great Island Channel SAC 001058

An Roinn Ealaíon, Oidhreachta agus Gaeltachta
Department of Arts, Heritage and the Gaeltacht

MAP 1:
GREAT ISLAND CHANNEL SAC CONSERVATION OBJECTIVES SAC DESIGNATION

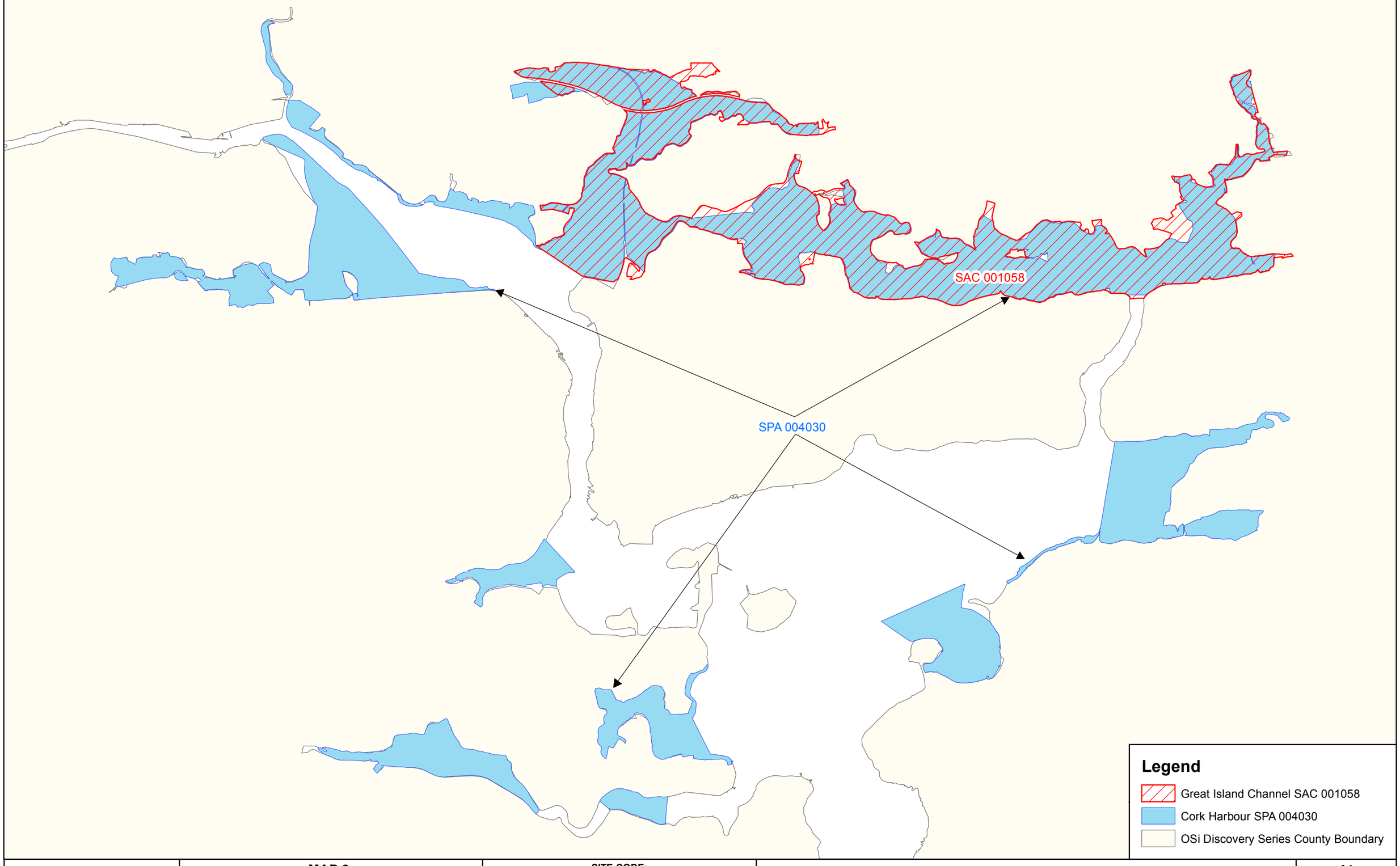
Map to be read in conjunction with the NPWS Conservation Objectives Document.

SITE CODE:
SAC 001058; version 3. CO. CORK

0 0.5 1 1.5 2 km

N

Map Version 1
Date: June 2014



Legend

- Great Island Channel SAC 001058
- Cork Harbour SPA 004030
- OSi Discovery Series County Boundary

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MAP 2:
GREAT ISLAND CHANNEL SAC CONSERVATION OBJECTIVES ADJOINING / OVERLAPPING DESIGNATIONS

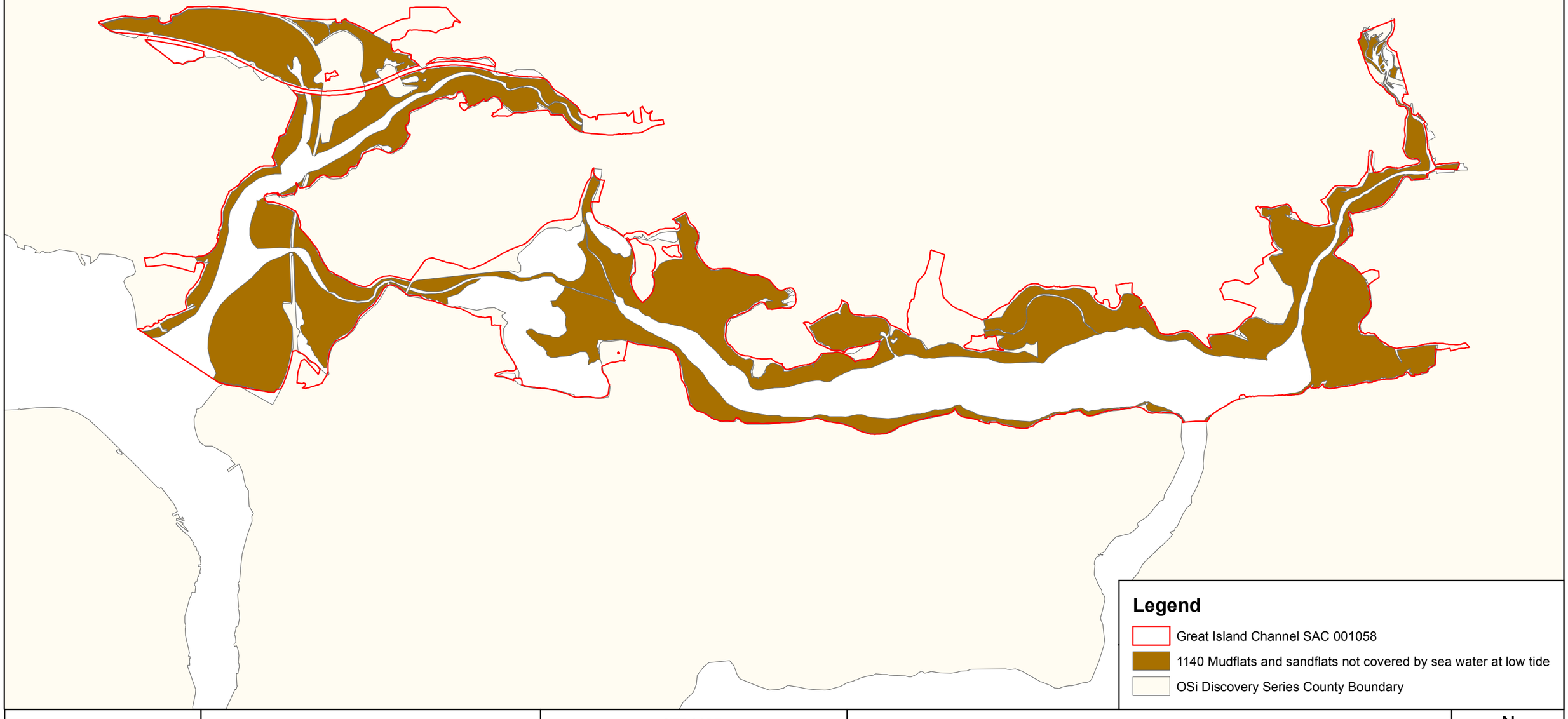
Map to be read in conjunction with the NPWS Conservation Objectives Document.

SITE CODE:
SAC 001058; version 3.
SPA 004030; version 2.04. CO. CORK

0 1 2 3 km

N

Map Version 1
Date: June 2014



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MAP 3:
GREAT ISLAND CHANNEL SAC
CONSERVATION OBJECTIVES
TIDAL MUDFLATS AND SANDFLATS

Map to be read in conjunction with the NPWS Conservation Objectives Document.

SITE CODE:
SAC 001058; version 3. CO. CORK

0 0.5 1 1.5 2 km

N

Map Version 1
Date: June 2014

Legend

Great Island Channel SAC 001058

OSi Discovery Series County Boundary

Marine Community Types

Mixed sediment to sandy mud with polychaetes and oligochaetes community complex

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Department of Arts, Heritage and the Gaeltacht

MAP 4:
GREAT ISLAND CHANNEL SAC
CONSERVATION OBJECTIVES
MARINE COMMUNITY TYPES

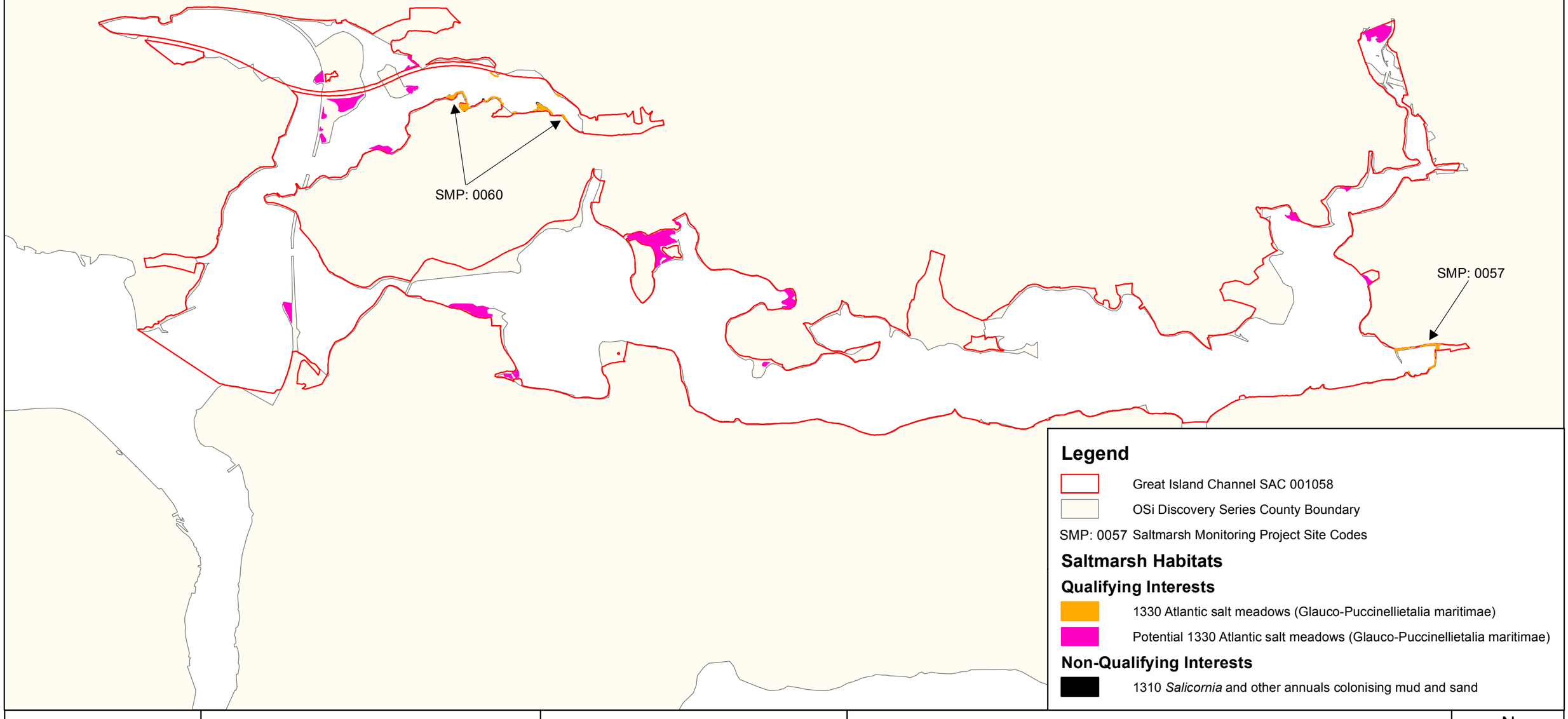
Map to be read in conjunction with the NPWS Conservation Objectives Document.

SITE CODE:
SAC 001058; version 3. CO. CORK

0 0.5 1 1.5 2 km

N

Map Version 1
Date: June 2014



Legend

- Great Island Channel SAC 001058
- OSi Discovery Series County Boundary

SMP: 0057 Saltmarsh Monitoring Project Site Codes

Saltmarsh Habitats

Qualifying Interests

- 1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimae)
- Potential 1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimae)

Non-Qualifying Interests

- 1310 *Salicornia* and other annuals colonising mud and sand

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Department of Arts, Heritage and the Gaeltacht

MAP 5:
GREAT ISLAND CHANNEL SAC
CONSERVATION OBJECTIVES
SALTMARSH HABITATS

Map to be read in conjunction with the NPWS Conservation Objectives Document.

SITE CODE:
SAC 001058; version 3. CO. CORK

0 0.5 1 1.5 2 km

N

Map Version 1
Date: June 2014

NATURA 2000 - STANDARD DATA FORM

For Special Protection Areas (SPA),
Proposed Sites for Community Importance (pSCI),
Sites of Community Importance (SCI) and
for Special Areas of Conservation (SAC)

SITE	**IE0001058**
SITENAME	**Great Island Channel SAC**

TABLE OF CONTENTS

1. SITE IDENTIFICATION

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1.1 Type	1.2 Site code
B	IE0001058

1.3 Site name

Great Island Channel SAC

1.4 First Compilation date	1.5 Update date
2000-01	2017-09

1.6 Respondent:

Name/Organisation:	National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht
Address:	7 Ely Place, Dublin 2, Ireland
Email:	datadelivery@ahg.gov.ie

Date site proposed as SCI:	2000-01
Date site confirmed as SCI:	No data
Date site designated as SAC:	No data
National legal reference of SAC designation:	No data

2. SITE LOCATION

Back to top

2.1 Site-centre location [decimal degrees]:

Longitude
-8.261539396

Latitude
51.88990881

2.2 Area [ha]:

1442.59654

2.3 Marine area [%]

86.139

2.4 Sitelength [km]:

0.0

2.5 Administrative region code and name

NUTS level 2 code	Region Name
IEZZ	Extra-Regio
IE02	Southern and Eastern

2.6 Biogeographical Region(s)

Atlantic (%)

3. ECOLOGICAL INFORMATION

Back to top

3.1 Habitat types present on the site and assessment for them

Annex I Habitat types						Site assessment			
Code	PF	NP	Cover [ha]	Cave [number]	Data quality	A|B|C|D	A|B|C		
						Representativity	Relative Surface	Conservation	Global
1130			288.64		M	D			
1140			722.5478		M	B	B	B	B
1320			144.32		M	D			
1330			18.9056		M	B	C	B	B

- **PF:** for the habitat types that can have a non-priority as well as a priority form (6210, 7130, 9430) enter "X" in the column PF to indicate the priority form.
- **NP:** in case that a habitat type no longer exists in the site enter: x (optional)
- **Cover:** decimal values can be entered
- **Caves:** for habitat types 8310, 8330 (caves) enter the number of caves if estimated surface is not available.
- **Data quality:** G = 'Good' (e.g. based on surveys); M = 'Moderate' (e.g. based on partial data with some extrapolation); P = 'Poor' (e.g. rough estimation)

3.2 Species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive

92/43/EEC and site evaluation for them

Species					Population in the site						Site assessment			
G	Code	Scientific Name	S	NP	T	Size		Unit	Cat.	D.qual.	A|B|C|D	A|B|C		
						Min	Max				Pop.	Con.	Iso.	Glo.
B	A054	Anas acuta			w	22	22	i		G	C	B	C	B
B	A056	Anas clypeata			w	35	35	i		G	C	B	C	C
B	A052	Anas crecca			w	554	554	i		G	C	A	C	B
B	A050	Anas penelope			w	1178	1178	i		G	C	A	C	B
B	A053	Anas platyrhynchos			w	237	237	i		G	C	B	C	C
B	A169	Arenaria interpres			w	50	50	i		G	C	B	C	C
B	A149	Calidris alpina			w	6000	6000	i		G	B	A	C	A
B	A137	Charadrius hiaticula			w	50	50	i		G	C	B	C	C
B	A130	Haematopus ostralegus			w	871	871	i		G	C	A	C	B
B	A157	Limosa lapponica			w	215	215	i		G	C	B	C	B
B	A156	Limosa limosa			w	590	590	i		G	B	A	C	A
B	A070	Mergus merganser			w	65	65	i		G	B	A	C	B
B	A160	Numenius arquata			w	815	815	i		G	C	B	C	C
B	A017	Phalacrocorax carbo			w	317	317	i		G	B	A	C	B
B	A140	Pluvialis apricaria			w	2250	2250	i		G	C	B	C	B
B	A141	Pluvialis squatarola			w	40	40	i		G	C	B	C	C
B	A048	Tadorna tadorna			w	1105	1105	i		G	B	A	C	A
B	A164	Tringa nebularia			w	17	17	i		G	B	B	C	B
B	A162	Tringa totanus			w	948	948	i		G	B	A	C	A
B	A142	Vanellus vanellus			w	6000	6000	i		G	B	A	C	B

- **Group:** A = Amphibians, B = Birds, F = Fish, I = Invertebrates, M = Mammals, P = Plants, R = Reptiles
- **S:** in case that the data on species are sensitive and therefore have to be blocked for any public access enter: yes
- **NP:** in case that a species is no longer present in the site enter: x (optional)
- **Type:** p = permanent, r = reproducing, c = concentration, w = wintering (for plant and non-migratory species use permanent)
- **Unit:** i = individuals, p = pairs or other units according to the Standard list of population units and

codes in accordance with Article 12 and 17 reporting (see reference portal)

- **Abundance categories (Cat.):** C = common, R = rare, V = very rare, P = present - to fill if data are deficient (DD) or in addition to population size information
- **Data quality:** G = 'Good' (e.g. based on surveys); M = 'Moderate' (e.g. based on partial data with some extrapolation); P = 'Poor' (e.g. rough estimation); VP = 'Very poor' (use this category only, if not even a rough estimation of the population size can be made, in this case the fields for population size can remain empty, but the field "Abundance categories" has to be filled in)

4. SITE DESCRIPTION

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4.1 General site character

Habitat class	% Cover
N10	3.0
N16	1.0
N19	1.0
N08	1.0
N07	1.0
N02	88.0
N03	2.0
N05	1.0
N09	1.0
N23	1.0
Total Habitat Cover	100

Other Site Characteristics

This site comprises the north-eastern part of Cork Harbour. It includes all of the Great Island Channel, the intertidal areas between Fota Island and Little Island, and also the estuary of the Dungourney and Owennacurra Rivers as far as Midleton. The North Channel is on average 1 km wide but extends for about 9 km from east to west. The area is well sheltered and the intertidal sediments are predominantly fine muds. In addition to the estuarine habitats, the site includes some wet grassland areas which are used by roosting birds, as well as some broad-leaved woodland at Fota Island. Compared to the rest of Cork Harbour, the Great Island Channel is relatively undisturbed, with aquaculture the main activity.

4.2 Quality and importance

The site is of ecological importance for its examples of intertidal mud and sand flats and Atlantic salt meadows of the estuarine type. Both habitats are fairly extensive in area and of moderate to good quality. Site has high ornithological importance, supporting regularly c.50% of the wintering waterfowl of Cork Harbour. Significant proportions of the internationally important populations of Limosa limosa and Tringa totanus which winter in Cork Harbour utilise the site and it supports nationally important populations of a further 12 species, including Pluvialis apricaria and Limosa lapponica, both listed on Annex I of the EU Birds Directive.

4.3 Threats, pressures and activities with impacts on the site

The most important impacts and activities with high effect on the site

Negative Impacts			
Rank	Threats and pressures [code]	Pollution (optional) [code]	inside/outside [i|o|b]
M	A04		i
M	I01		i

Positive Impacts			
Rank	Activities, management [code]	Pollution (optional) [code]	inside/outside [i|o|b]
M	A04		i

H	J02.01.02		i
M	A08		o
H	D01.02		i
H	E01		o
H	F01		i
M	K02.03		i

Rank: H = high, M = medium, L = low
Pollution: N = Nitrogen input, P = Phosphor/Phosphate input, A = Acid input/acidification,
T = toxic inorganic chemicals, O = toxic organic chemicals, X = Mixed pollutions
i = inside, o = outside, b = both

4.5 Documentation

Aquatic Services Unit (1995). Baseline Survey of Flora and Fauna (birds) of Inner Cork Harbour (March - June 1995). Unpublished report to Forbairt, Dublin. Berrow, S.D. (1991). Heavy metals in sediments and shellfish from Cork Harbour, Ireland. Marine Pollution Bulletin 22: 467-469. Bowman, J.J., Clabby, K.J., Lucey, J., McGarrigle, M. and Toner, P. (1996). Water Quality in Ireland 1991-1994. Environmental Protection Agency, Wexford. Colhoun, K. (1998). I-WeBS Report 1996-97. BirdWatch Ireland, Dublin. Coveney, J. (1992). Cork Harbour counts 1991-1992: An interim report. Cork Bird Report 1991: 71-75. Cunningham, P. (1997). Lee Estuary and Cork Harbour. A Preliminary Review of the Results of EPA Water Quality Surveys 1994-1996. EPA, Wexford. Curtis, T.G.F. and Sheehy Skeffington, M.J. (1998). The salt marshes of Ireland: an inventory and account of their geographical variation. Biology and the Environment, Proceedings of the Royal Irish Academy 98B: 87-104. Environmental Research Unit (1989). Cork Harbour Water Quality. A Summary and Assessment of the Present Position. E.R.U., Dublin. Goodwillie, R. (1986). Areas of Scientific Interest in Co. Cork. Report compiled for Cork County Council. Heffernan, M.L. (1995). Shellfish Farming and Special Protection Areas for birds in Ireland. Unpublished M.Sc. Thesis, University of Dublin. Hutchinson, C.D. (1979). Ireland?s Wetlands and their Birds. I.W.C., Dublin. Hutchinson, C.D. and O?Halloran, J. (1984). The waterfowl of Cork Harbour. Irish Birds 2: 445-456. Merne, O.J. (1989). Important Bird Areas in Ireland. In: Grimmett, R.F.A. and Jones, T.A. (eds.) Important Bird Areas in Europe. ICBP Technical Publication No. 9. Nairn, R.G.W. (1986). Spartina anglica in Ireland and its potential impact on wildfowl and waders - a review. Irish Birds 3: 215-228. Nixon, E., McLoughlin D., Rowe, A. and Smyth, M. (1995). Monitoring of Shellfish Growing Areas - 1994. Fishery Leaflet 166. Department of the Marine, Dublin. O?Sullivan, M.C. (1977). Cork Harbour Pollution Report. A report to Cork County Council, Cork Corporation and Cork Harbour Commissioners. O?Sullivan, M.C. (1981). Report on Midleton Sewage Treatment, for Midleton Urban District Council. Sheppard, R. (1993). Ireland?s Wetland Wealth. I.W.C., Dublin. Smiddy, P., O?Halloran, J, Coveney, J.A., Leonard, P.G. and Shorten M. (1995). Wintering waterfowl populations of Cork Harbour: an update. Irish Birds 5: 285-294. Smyth, M., Rowe, A., McGovern, E. and Nixon, E. (1997). Monitoring of Shellfish Growing Areas - 1995. Fishery Leaflet 174. Marine Institute, Dublin. Whelan, M. (1984). Survey of Cork Harbour: Summer 1984. A report to Cork County Council.

5. SITE PROTECTION STATUS (optional)

designated at international level:

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Type	Site name	Type	Cover [%]
Other	Cork Harbour	*	70.0

6. SITE MANAGEMENT

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6.2 Management Plan(s):

An actual management plan does exist:

- [ ] Yes
- [ ] No, but in preparation
- [X] No

7. MAP OF THE SITES

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INSPIRE ID: IE.NPWS.PS.NATURA2000.SAC.IE0001058

Map delivered as PDF in electronic format (optional)

☐ Yes ☒ No

Reference(s) to the original map used for the digitalisation of the electronic boundaries (optional).

SITE SYNOPSIS

Site Name: Great Island Channel SAC

Site Code: 001058

The Great Island Channel stretches from Little Island to Midleton, with its southern boundary being formed by Great Island. It is an integral part of Cork Harbour which contains several other sites of conservation interest. Geologically, Cork Harbour consists of two large areas of open water in a limestone basin, separated from each other and the open sea by ridges of Old Red Sandstone. Within this system, Great Island Channel forms the eastern stretch of the river basin and, compared to the rest of Cork Harbour, is relatively undisturbed. Within the site is the estuary of the Owennacurra and Dungourney Rivers. These rivers, which flow through Midleton, provide the main source of freshwater to the North Channel.

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

[1140] Tidal Mudflats and Sandflats
[1330] Atlantic Salt Meadows

The main habitats of conservation interest in Great Island Channel SAC are the sheltered tidal sand and mudflats and the Atlantic salt meadows. Owing to the sheltered conditions, the intertidal flats are composed mainly of soft muds. These muds support a range of macro-invertebrates, notably *Macoma balthica*, *Scrobicularia plana*, *Hydrobia ulvae*, *Nepthys hombergi, Nereis diversicolor* and *Corophium volutator*. Green algal species occur on the flats, especially *Ulva lactua* and *Enteromorpha* spp. Cordgrass (*Spartina* spp.) has colonised the intertidal flats in places, especially at Rossleague and Belvelly.

The saltmarshes are scattered through the site and are all of the estuarine type on mud substrate. Species present include Sea Purslane (*Halimione portulacoides*), Sea Aster (*Aster tripolium*), Thrift (*Armeria maritima*), Common Saltmarsh-grass (*Puccinellia maritima*), Sea Plantain (*Plantago maritima*), Greater Sea-spurrey (*Spergularia media*), Lax-flowered Sea-lavender (*Limonium humile*), Sea Arrowgrass (*Triglochin maritimum*), Sea Mayweed (*Matricaria maritima*) and Red Fescue (*Festuca rubra*).

The site is extremely important for wintering waterfowl and is considered to contain three of the top five areas within Cork Harbour, namely North Channel, Harper's Island and Belvelly-Marino Point. Shelduck is the most frequent duck species with 800-1,000 birds centred on the Fota/Marino Point area. There are also large flocks of Teal and Wigeon, especially at the eastern end. Waders occur in the greatest density

north of Rosslare, with Dunlin, Godwit, Curlew and Golden Plover the commonest species. A population of about 80 Grey Plover is a notable feature of the area. All the mudflats support feeding birds; the main roost sites are at Weir Island and Brown Island, and to the north of Fota at Killacloyne and Harper's Island. Ahanesk supports a roost also but is subject to disturbance. The numbers of Grey Plover and Shelduck, as given above, are of national importance.

The site is an integral part of Cork Harbour which is a wetland of international importance for the birds it supports. Overall, Cork Harbour regularly holds over 20,000 waterfowl and contains internationally important numbers of Black-tailed Godwit (1,181) and Redshank (1,896), along with nationally important numbers of nineteen other species. Furthermore, it contains large Dunlin (12,019) and Lapwing (12,528) flocks. All counts are average peaks, 1994/95 – 1996/97. Much of the site falls within Cork Harbour Special Protection Area, an important bird area designated under the E.U. Birds Directive.

While the main land use within the site is aquaculture (oyster farming), the greatest threats to its conservation significance come from road works, infilling, sewage outflows and possible marina developments.

The site is of major importance for the two habitats listed on Annex I of the E.U. Habitats Directive, as well as for its important numbers of wintering waders and wildfowl. It also supports a good invertebrate fauna.

Appendix C Cork Harbour SPA Site Documentation

ISSN 2009-4086

National Parks and Wildlife Service

Conservation Objectives Series

Cork Harbour SPA 004030

An Roinn
Ealaíon, Oidhreachta agus Gaeltachta

Department of
Arts, Heritage and the Gaeltacht

National Parks and Wildlife Service,
Department of Arts, Heritage and the Gaeltacht,

7 Ely Place, Dublin 2, Ireland.

Web: www.npws.ie
E-mail: nature.conservation@ahg.gov.ie

Citation:

NPWS (201п) Conservation Objectives: Cork Harbour SPA 004030. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

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Introduction

The overall aim of the Habitats Directive is to maintain or restore the favourable conservation status of habitats and species of community interest. These habitats and species are listed in the Habitats and Birds Directives and Special Areas of Conservation and Special Protection Areas are designated to afford protection to the most vulnerable of them. These two designations are collectively known as the Natura 2000 network.

European and national legislation places a collective obligation on Ireland and its citizens to maintain habitats and species in the Natura 2000 network at favourable conservation condition. The Government and its agencies are responsible for the implementation and enforcement of regulations that will ensure the ecological integrity of these sites.

A site-specific conservation objective aims to define favourable conservation condition for a particular habitat or species at that site.

The maintenance of habitats and species within Natura 2000 sites at favourable conservation condition will contribute to the overall maintenance of favourable conservation status of those habitats and species at a national level.

Favourable conservation status of a habitat is achieved when:

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

The favourable conservation status of a species is achieved when:

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

Notes/Guidelines:

1. The targets given in these conservation objectives are based on best available information at the time of writing. As more information becomes available, targets for attributes may change. These will be updated periodically, as necessary.
2. An appropriate assessment based on these conservation objectives will remain valid even if the targets are subsequently updated, providing they were the most recent objectives available when the assessment was carried out. It is essential that the date and version are included when objectives are cited.
3. Assessments cannot consider an attribute in isolation from the others listed for that habitat or species, or for other habitats and species listed for that site. A plan or project with an apparently small impact on one attribute may have a significant impact on another.
4. Please note that the maps included in this document do not necessarily show the entire extent of the habitats and species for which the site is listed. This should be borne in mind when appropriate assessments are being carried out.
5. When using these objectives, it is essential that the relevant backing/supporting documents are consulted, particularly where instructed in the targets or notes for a particular attribute.

Qualifying Interests

**** indicates a priority habitat under the Habitats Directive***

004030 Cork Harbour SPA

A004	Little Grebe *Tachybaptus ruficollis*
A005	Great Crested Grebe *Podiceps cristatus*
A017	Cormorant *Phalacrocorax carbo*
A028	Grey Heron *Ardea cinerea*
A048	Shelduck *Tadorna tadorna*
A050	Wigeon *Anas penelope*
A052	Teal *Anas crecca*
A054	Pintail *Anas acuta*
A056	Shoveler *Anas clypeata*
A069	Red-breasted Merganser *Mergus serrator*
A130	Oystercatcher *Haematopus ostralegus*
A140	Golden Plover *Pluvialis apricaria*
A141	Grey Plover *Pluvialis squatarola*
A142	Lapwing *Vanellus vanellus*
A149	Dunlin *Calidris alpina alpina*
A156	Black-tailed Godwit *Limosa limosa*
A157	Bar-tailed Godwit *Limosa lapponica*
A160	Curlew *Numenius arquata*
A162	Redshank *Tringa totanus*
A179	Black-headed Gull *Chroicocephalus ridibundus*
A182	Common Gull *Larus canus*
A183	Lesser Black-backed Gull *Larus fuscus*
A193	Common Tern *Sterna hirundo*
A999	Wetlands

Please note that this SPA overlaps with Great Island Channel SAC (001058). See map 2. The conservation objectives for this site should be used in conjunction with those for the overlapping site as appropriate.

Supporting documents, relevant reports & publications

Supporting documents, NPWS reports and publications are available for download from: www.npws.ie/Publications

NPWS Documents

Year :	2014
Title :	Cork Harbour SPA (site code: 4030) Conservation objectives supporting document V1
Author :	NPWS
Series :	Conservation objectives supporting document

Other References

Year :	1985
Title :	Breeding seabirds on the east Cork coastline
Author :	Smiddy, P.
Series :	Cork Bird Report 1984: 46-50
Year :	1995
Title :	Seabird monitoring handbook for Britain and Ireland: a compilation of methods for survey and monitoring of breeding seabirds
Author :	Walsh, P.; Halley, D.J.; Harris, M.P.; del Nevo, A.; Sim, I.M.W.; Tasker, M.L.
Series :	JNCC, Peterborough
Year :	1996
Title :	Handbook of birds of the world volume 3: hoatzin to auks
Author :	del Hoyo, J.; Elliott, A.; Sargatal, J.
Series :	Lynx Edicions, Barcelona
Year :	2000
Title :	Common terns *Sterna hirundo* nesting on Cork Harbour
Author :	Wilson, J.; O'Mahony, B.; Smiddy, P.
Series :	Irish Birds Vol. 6(4)
Year :	2014
Title :	Seabird Monitoring Programme (SMP) Database
Author :	JNCC
Series :	http://jncc.defra.gov.uk/smp/Default.aspx
Year :	2014
Title :	BirdLife International Seabird Ecology and Foraging Range Database
Author :	BirdLife International
Series :	http://seabird.wikispaces.com
Year :	2014
Title :	Chapter 15 in: Ringaskiddy Port Redevelopment. Environmental Impact Statement
Author :	RPS
Series :	Report to Port of Cork

A004 Little Grebe *Tachybaptus ruficollis*

To maintain the favourable conservation condition of Little Grebe in Cork Harbour SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by little grebe, other than that occurring from natural patterns of variation	Waterbird distribution from the 2010/2011 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A005 Great Crested Grebe *Podiceps cristatus*

To maintain the favourable conservation condition of Great Crested Grebe in Cork Harbour SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by great crested grebe, other than that occurring from natural patterns of variation	Waterbird distribution from the 2010/2011 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A017 Cormorant *Phalacrocorax carbo*

To maintain the favourable conservation condition of Cormorant in Cork Harbour SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by cormorant, other than that occurring from natural patterns of variation	Waterbird distribution from the 2010/2011 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A028 Grey Heron *Ardea cinerea*

To maintain the favourable conservation condition of Grey Heron in Cork Harbour SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by grey heron, other than that occurring from natural patterns of variation	Waterbird distribution from the 2010/2011 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A048 Shelduck *Tadorna tadorna*

To maintain the favourable conservation condition of Shelduck in Cork Harbour SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by shelduck, other than that occurring from natural patterns of variation	Waterbird distribution from the 2010/2011 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A050 Wigeon *Anas penelope*

To maintain the favourable conservation condition of Wigeon in Cork Harbour SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by wigeon, other than that occurring from natural patterns of variation	Waterbird distribution from the 2010/2011 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A052 Teal *Anas crecca*

To maintain the favourable conservation condition of Teal in Cork Harbour SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by teal, other than that occurring from natural patterns of variation	Waterbird distribution from the 2010/2011 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A054 Pintail *Anas acuta*

To maintain the favourable conservation condition of Pintail in Cork Harbour SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by pintail, other than that occurring from natural patterns of variation	Waterbird distribution from the 2010/2011 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A056 Shoveler *Anas clypeata*

To maintain the favourable conservation condition of Shoveler in Cork Harbour SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by shoveler, other than that occurring from natural patterns of variation	Waterbird distribution from the 2010/2011 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A069 Red-breasted Merganser *Mergus serrator*

To maintain the favourable conservation condition of Red-breasted Merganser in Cork Harbour SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by red-breasted merganser, other than that occurring from natural patterns of variation	Waterbird distribution from the 2010/2011 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A130 Oystercatcher *Haematopus ostralegus*

To maintain the favourable conservation condition of Oystercatcher in Cork Harbour SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing and intensity of use of areas by oystercatcher, other than that occurring from natural patterns of variation	Waterbird distribution from the 2010/2011 waterbird survey programme is discussed in part four of the conservation objectives supporting document

A140 Golden Plover *Pluvialis apricaria*

To maintain the favourable conservation condition of Golden Plover in Cork Harbour SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by golden plover, other than that occurring from natural patterns of variation	Waterbird distribution from the 2010/2011 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A141 Grey Plover *Pluvialis squatarola*

To maintain the favourable conservation condition of Grey Plover in Cork Harbour SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by grey plover, other than that occurring from natural patterns of variation	Waterbird distribution from the 2010/2011 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A142 Lapwing *Vanellus vanellus*

To maintain the favourable conservation condition of Lapwing in Cork Harbour SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by lapwing, other than that occurring from natural patterns of variation	Waterbird distribution from the 2010/2011 waterbird survey programme is discussed in part five of the conservation objectives

A149 Dunlin *Calidris alpina alpina*

To maintain the favourable conservation condition of Dunlin in Cork Harbour SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by dunlin, other than that occurring from natural patterns of variation	Waterbird distribution from the 2010/2011 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A156 Black-tailed Godwit *Limosa limosa*

To maintain the favourable conservation condition of Black-tailed Godwit in Cork Harbour SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by black-tailed godwit, other than that occurring from natural patterns of variation	Waterbird distribution from the 2010/2011 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A157 Bar-tailed Godwit *Limosa lapponica*

To maintain the favourable conservation condition of Bar-tailed Godwit in Cork Harbour SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by bar-tailed godwit, other than that occurring from natural patterns of variation	Waterbird distribution from the 2010/2011 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A160 Curlew *Numenius arquata*

To maintain the favourable conservation condition of Curlew in Cork Harbour SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by curlew, other than that occurring from natural patterns of variation	Waterbird distribution from the 2010/2011 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A162 Redshank *Tringa totanus*

To maintain the favourable conservation condition of Redshank in Cork Harbour SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by redshank, other than that occurring from natural patterns of variation	Waterbird distribution from the 2010/2011 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A164 Greenshank *Tringa nebularia*

To maintain the favourable conservation condition of Greenshank in Cork Harbour SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by greenshank, other than that occurring from natural patterns of variation	Waterbird distribution from the 2010/2011 waterbird survey programme is discussed in part four of the conservation objectives supporting document

A179 Black-headed Gull *Chroicocephalus ridibundus*

To maintain the favourable conservation condition of Black-headed Gull in Cork Harbour SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by black-headed gull other than that occurring from natural patterns of variation	Waterbird distribution from the 2010/2011 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A182 Common Gull *Larus canus*

To maintain the favourable conservation condition of Common Gull in Cork Harbour SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by common gull, other than that occurring from natural patterns of variation	Waterbird distribution from the 2010/2011 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A183 Lesser Black-backed Gull *Larus fuscus*

To maintain the favourable conservation condition of Lesser Black-backed Gull in Cork Harbour SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population trend	Percentage change	Long term population trend stable or increasing	Waterbird population trends are presented in part four of the conservation objectives supporting document
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by lesser black-backed gull, other than that occurring from natural patterns of variation	Waterbird distribution from the 2010/2011 waterbird survey programme is discussed in part five of the conservation objectives supporting document

A193 Common Tern *Sterna hirundo*

To maintain the favourable conservation condition of Common Tern in Cork Harbour SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Breeding population abundance: apparently occupied nests (AONs)	Number	No significant decline	Measure based on standard tern survey methods (see Walsh et al., 1995). Wilson et al. (2000) provides background summary population information for the Cork Harbour area. In 2012 the total population of common terns that nested within the wider Cork Harbour was between 85 and 95 pairs, a proportion of which now breeds outside the SPA (RPS, 2014)
Productivity rate: fledged young per breeding pair	Mean number	No significant decline	Measure based on standard tern survey methods (see Walsh et al., 1995). The Seabird Monitoring Programme (SMP) (JNCC, 2014) provides population data for this species
Distribution: breeding colonies	Number; location; area (hectares)	No significant decline	Common tern breeding colonies can be sited in both coastal and inland areas using a wide variety of habitats including sandy, rocky or well-vegetated islands in estuaries, lakes and rivers. This species can also use artificial substrates (Del Hoyo et al., 1996). First recorded nesting in saltmarsh in 1969-70 (Smiddy, 1985), the colony now largely breeds on artificial structures in at least two locations (see Wilson et al., 2000 and RPS, 2014)
Prey biomass available	Kilogrammes	No significant decline	Key prey items: Small fish, crustaceans, insects and occasionally squid. Key habitats: common tern forage in/over shallow coastal waters, bays, inlets, shoals, tidal-rips, drift lines, beaches, saltmarsh creeks, lakes, ponds or rivers. Foraging range: max. 37km, mean max. 33.81km, mean 8.67km (Birdlife International Seabird Database (Birdlife International, 2014))
Barriers to connectivity	Number; location; shape; area (hectares)	No significant increase	Seabird species can make extensive use of marine waters adjacent to their breeding colonies. Foraging range: max. 37km, mean max. 33.81km, mean 8.67km (BirdLife International Seabird Database (Birdlife International, 2014))
Disturbance at the breeding site	Level of impact	Human activities should occur at levels that do not adversely affect the breeding common tern population	In the Cork Harbour area, this species largely breeds on artificial structures (see Wilson et al., 2000 and RPS, 2014)

Conservation Objectives for : Cork Harbour SPA [004030]

A999 Wetlands

To maintain the favourable conservation condition of the wetland habitat in Cork Harbour SPA as a resource for the regularly-occurring migratory waterbirds that utilise it. This is defined by the following attribute and target:

Attribute	Measure	Target	Notes
Habitat area	Hectares	The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 2,587 hectares, other than that occurring from natural patterns of variation	The wetland habitat area was estimated as 2,587ha using OSi data and relevant orthophotographs. For further information see part three of the conservation objectives supporting document

Legend

Cork Harbour SPA 004030

An Roinn Ealaíon, Oidhreachta agus Gaeltachta
Department of Arts, Heritage and the Gaeltacht

MAP 1: CORK HARBOUR SPA CONSERVATION OBJECTIVES SPA DESIGNATION

Map to be read in conjunction with the NPWS Conservation Objectives Document.

SITE CODE:
SAC 004030; version 2.04. CO. CORK

0 1 2 3 4 km

N

Map Version 1
Date: Dec 2014

SPA 004030

SPA 004030

SAC 001058

SPA 004030

SPA 004030

SPA 004030

SPA 004030

SPA 004030

SPA 004030

Legend

- Cork Harbour SPA 004030
- Great Island Channel SAC 001058
- OSi Discovery Series County Boundary

An Roinn
Ealaíon, Oidhreachta agus Gaeltachta
Department of
Arts, Heritage and the Gaeltacht

MAP 2:
CORK HARBOUR SPA
CONSERVATION OBJECTIVES
ADJOINING / OVERLAPPING DESIGNATIONS

Map to be read in conjunction with the NPWS Conservation Objectives Document.

SITE CODE:
SAC 001058; version 3.
SPA 004030; version 2.04. CO. CORK

0 1 2 3 km

N

Map Version 1
Date: Dec 2014

NATURA 2000 - STANDARD DATA FORM

For Special Protection Areas (SPA),
Proposed Sites for Community Importance (pSCI),
Sites of Community Importance (SCI) and
for Special Areas of Conservation (SAC)

SITE **IE0004030**

SITENAME **Cork Harbour SPA**

TABLE OF CONTENTS

1. SITE IDENTIFICATION

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1.1 Type	1.2 Site code
A	IE0004030

1.3 Site name

Cork Harbour SPA

1.4 First Compilation date	1.5 Update date
2003-11	2017-09

1.6 Respondent:

Name/Organisation:	National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht
Address:	7 Ely Place, Dublin 2, Ireland
Email:	datadelivery@ahg.gov.ie

1.7 Site indication and designation / classification dates

Date site classified as SPA:	1994-11
National legal reference of SPA designation	No data

2. SITE LOCATION

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2.1 Site-centre location [decimal degrees]:

Longitude	Latitude

-8.287858773 51.88119696

2.2 Area [ha]:

2660.269531

2.3 Marine area [%]

90.792

2.4 Sitelength [km]:

0.0

2.5 Administrative region code and name

NUTS level 2 code	Region Name
IE02	Southern and Eastern
IEZZ	Extra-Regio

2.6 Biogeographical Region(s)

Atlantic (%)

3. ECOLOGICAL INFORMATION

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3.2 Species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC and site evaluation for them

Species					Population in the site						Site assessment			
G	Code	Scientific Name	S	NP	T	Size		Unit	Cat.	D.qual.	A|B|C|D	A|B|C		
						Min	Max				Pop.	Con.	Iso.	Glo.
B	A054	Anas acuta			w	84	84	i		G	B	A	C	A
B	A056	Anas clypeata			w	135	135	i		G	B	A	C	A
B	A052	Anas crecca			w	807	807	i		G	C	A	C	B
B	A050	Anas penelope			w	1750	1750	i		G	C	A	C	B
B	A053	Anas platyrhynchos			w	456	456	i		G	C	A	C	C
B	A051	Anas strepera			w	15	15	i		G	C	B	C	B
B	A169	Arenaria interpres			w	99	99	i		G	C	A	C	C
B	A059	Aythya ferina			w	145	145	i		G	C	B	C	C
B	A061	Aythya fuligula			w	97	97	i		G	C	B	C	C
B	A067	Bucephala clangula			w	15	15	i		G	C	B	C	C
B	A149	Calidris alpina			w	4936	4936	i		G	B	A	C	A
B	A143	Calidris canutus			w	31	31	i		G	C	B	C	C

B	A137	Charadrius hiaticula			w	51	51	i		G	C	B	C	C
B	A038	Cygnus cygnus			w	10	10	i		G	C	C	C	C
B	A125	Fulica atra			w	77	77	i		G	C	B	C	C
B	A130	Haematopus ostralegus			w	791	791	i		G	C	A	C	B
B	A182	Larus canus			w	2630	2630	i		G	B	A	C	A
B	A183	Larus fuscus			w	261	261	i		G	B	A	C	A
B	A179	Larus ridibundus			w	948	948	i		G	C	A	C	C
B	A157	Limosa lapponica			w	45	45	i		G	C	B	C	C
B	A156	Limosa limosa			w	412	412	i		G	B	A	C	B
B	A069	Mergus serrator			w	90	90	i		G	B	A	C	B
B	A160	Numenius arquata			w	1345	1345	i		G	B	A	C	B
B	A017	Phalacrocorax carbo			w	620	620	i		G	B	A	C	A
B	A151	Philomachus pugnax			c	5	10	i		G	C	B	C	C
B	A151	Philomachus pugnax			w	1	5	i		G	C	B	C	C
B	A140	Pluvialis apricaria			w	805	805	i		G	C	B	C	C
B	A141	Pluvialis squatarola			w	66	66	i		G	C	A	C	C
B	A005	Podiceps cristatus			w	218	218	i		G	B	A	C	A
B	A193	Sterna hirundo			r	69	69	p		G	B	B	C	A
B	A048	Tadorna tadorna			w	1426	1426	i		G	B	A	C	A
B	A161	Tringa erythropus			c	1	5	i		G	C	B	C	C
B	A161	Tringa erythropus			w	1	3	i		G	C	B	C	C
B	A164	Tringa nebularia			w	36	36	i		G	C	A	C	B
B	A165	Tringa ochropus			c	1	5	i		G	C	B	C	C
B	A165	Tringa ochropus			w	1	3	i		G	C	B	C	C
B	A162	Tringa totanus			w	1614	1614	i		G	B	A	C	A
B	A142	Vanellus vanellus			w	3614	3614	i		G	C	A	C	B

- **Group:** A = Amphibians, B = Birds, F = Fish, I = Invertebrates, M = Mammals, P = Plants, R = Reptiles
- **S:** in case that the data on species are sensitive and therefore have to be blocked for any public access enter: yes
- **NP:** in case that a species is no longer present in the site enter: x (optional)
- **Type:** p = permanent, r = reproducing, c = concentration, w = wintering (for plant and non-migratory species use permanent)
- **Unit:** i = individuals, p = pairs or other units according to the Standard list of population units and codes in accordance with Article 12 and 17 reporting (see reference portal)
- **Abundance categories (Cat.):** C = common, R = rare, V = very rare, P = present - to fill if data are deficient (DD) or in addition to population size information
- **Data quality:** G = 'Good' (e.g. based on surveys); M = 'Moderate' (e.g. based on partial data with some extrapolation); P = 'Poor' (e.g. rough estimation); VP = 'Very poor' (use this category only, if not even a rough estimation of the population size can be made, in this case the fields for population size can remain empty, but the field "Abundance categories" has to be filled in)

3.3 Other important species of flora and fauna (optional)

Species					Population in the site				Motivation					
Group	CODE	Scientific Name	S	NP	Size		Unit	Cat.	Species Annex		Other categories			
					Min	Max		C|R|V|P	IV	V	A	B	C	D
B		Ardea cinerea			47	47							X	
B		Cygnus olor			39	39							X	
B		Tachybaptus ruficollis			68	68							X	

- **Group:** A = Amphibians, B = Birds, F = Fish, Fu = Fungi, I = Invertebrates, L = Lichens, M = Mammals, P = Plants, R = Reptiles
- **CODE:** for Birds, Annex IV and V species the code as provided in the reference portal should be used in addition to the scientific name
- **S:** in case that the data on species are sensitive and therefore have to be blocked for any public access enter: yes
- **NP:** in case that a species is no longer present in the site enter: x (optional)
- **Unit:** i = individuals, p = pairs or other units according to the standard list of population units and codes in accordance with Article 12 and 17 reporting, (see reference portal)
- **Cat.:** Abundance categories: C = common, R = rare, V = very rare, P = present
- **Motivation categories: IV, V:** Annex Species (Habitats Directive), **A:** National Red List data; **B:** Endemics; **C:** International Conventions; **D:** other reasons

4. SITE DESCRIPTION

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4.1 General site character

Habitat class	% Cover
N10	1.0
N07	1.0
N02	94.0
N06	1.0
N23	1.0
N05	1.0
N03	1.0
Total Habitat Cover	100

Other Site Characteristics

Cork Harbour is a large, sheltered bay system, with several river estuaries - principally those of the Rivers Lee, Douglas, Owenboy and Owenacurra. The site comprises the main intertidal areas of Cork Harbour, including all of the North Channel, the Douglas Estuary, inner Lough Mahon, Monkstown Creek, Lough Beg, the Owenboy Estuary, Whitegate Bay and the Rostellan inlet. Owing to the sheltered conditions, the intertidal flats are often muddy in character. Salt marshes are scattered through the site and these provide high tide roosts for the birds. Otherwise, birds roost on stony shorelines and in some areas fields adjacent to the shore. Some shallow bay water is included in the site. Cork Harbour is adjacent to a major urban centre and a major industrial centre.

4.2 Quality and importance

Cork Harbour is an internationally important wetland site, regularly supporting in excess of 20,000 wintering waterfowl, for which it is amongst the top five sites in the country. It supports an internationally important population of Tringa totanus. A further 15 species have populations of national importance, with particularly notable numbers of Tadorna tadorna (9.6% of national total), Anas clypeata (4.5% of total), Anas acuta (4.2% of total) and Phalacrocorax carbo (4.1% of total) occurring. It has regionally important populations of Pluvialis apricaria and Limosa lapponica. Passage waders are regular, including Philomachus pugnax and Tringa erythropus. It is an important site for gulls in winter and autumn, especially Larus canus and Larus fuscus. The site provides both feeding and roosting areas for the waterfowl species. The quality of most of the estuarine habitats is good. The wintering birds have been well-monitored since the 1970s. The site has a breeding colony of Sterna hirundo which is of national importance. The colony is monitored annually and the chicks ringed.

4.3 Threats, pressures and activities with impacts on the site

The most important impacts and activities with high effect on the site

Negative Impacts			
Rank	Threats and pressures [code]	Pollution (optional) [code]	inside/outside [i|o|b]
M	G01.01		i
M	D03.02		i
M	A08		o
M	F02.03		i
H	F01		i
M	G01.02		i
L	E01.03		o
M	G01.06		i
H	E02		o
H	D01.02		o
H	E01		o
H	D03.01		o

Positive Impacts			
Rank	Activities, management [code]	Pollution (optional) [code]	inside/outside [i|o|b]
M	G01.01		i
H	F01		i
L	E01.03		o
M	F02.03		i
M	D03.02		i

Rank: H = high, M = medium, L = low

Pollution: N = Nitrogen input, P = Phosphor/Phosphate input, A = Acid input/acidification,

T = toxic inorganic chemicals, O = toxic organic chemicals, X = Mixed pollutions

i = inside, o = outside, b = both

4.5 Documentation

Colhoun, K. (2001). I-WeBS Report 1998-99. BirdWatch Ireland, Dublin. Curtis, T.G.F. and Sheehy Skeffington, M.J. (1998). The salt marshes of Ireland: an inventory and account of their geographical variation. Biology and Environment, Proceedings of the Royal Irish Academy 98B: 87-104. Hannon, C. (1997). The 1995 All-Ireland Tern Survey. BirdWatch Ireland Conservation Report No. 97/1. Hannon, C., Berrow, S.D. and Newton S.F. (1997). The status and distribution of breeding Sandwich Sterna sandvicensis, Roseate S. dougallii, Common S. hirundo, Arctic S. paradisaea and Little Terns S. albifrons in Ireland in 1995. Irish Birds 6: 1-22. Hunt, J., Derwin, J., Coveney, J. and Newton, S. (2000). Republic of Ireland. Pp. 365-416 in Heath, M.F. and Evans, M.I. (eds). Important Bird Areas in Europe: Priority Sites for Conservation 1: Northern Europe. Cambridge, UK: BirdLife International (BirdLife Conservation Series No. 8). Hutchinson,

C.D. and O'Halloran, J. (1984). The waterfowl of Cork Harbour. Irish Birds 2: 445-456. Irish Wetland Birds Survey (I-WeBS) Database, 1994/95-2000/01. BirdWatch Ireland, Dublin. McGarrigle, M.L., Bowman, J.J., Clabby, K.J., Lucey, J., Cunningham, P., MacCarthaigh, M., Keegan, M., Cantrell, B., Lehane, M., Clenaghan, C. and Toner, P.F. (2002). Water Quality in Ireland 1998-2000. Environmental Protection Agency, Wexford. Merne, O.J. (1989). Important bird areas in the Republic of Ireland. In: Grimmett, R.F.A. and Jones, T.A. (eds). Important Bird Areas in Europe. ICBP Technical Publication No. 9. Cambridge. O'Donoghue, P.D. and O'Halloran, J. (1994). The behaviour of a wintering flock of whooper swans Cygnus cygnus at Rostellan Lake, Cork. Biology and Environment, Proceedings of the Royal Irish Academy 94B: 109-118. Sheppard, R. (1993). Ireland's Wetland Wealth. IWC, Dublin. Smiddy, P., O'Halloran, J., Coveney, J.A., Leonard, P.G. and Shorten, M. (1995). Winter waterfowl populations of Cork Harbour: an update. Irish Birds 5: 285-294. Wilson, J., O'Mahony, B. and Smiddy, P. (2000). Common Terns Sterna hirundo breeding in Cork Harbour. Irish Birds 6: 597-599.

5. SITE PROTECTION STATUS (optional)

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5.1 Designation types at national and regional level:

Code	Cover [%]	Code	Cover [%]	Code	Cover [%]
IE05	10.0				

5.2 Relation of the described site with other sites:

designated at national or regional level:

Type code	Site name	Type	Cover [%]
IE05	Douglas Estuary Wildfowl Sanctuary	+	10.0

designated at international level:

Type	Site name	Type	Cover [%]
Other	Cork Harbour	*	100.0

6. SITE MANAGEMENT

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6.2 Management Plan(s):

An actual management plan does exist:

- [ ] Yes
- [ ] No, but in preparation
- [X] No

7. MAP OF THE SITES

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INSPIRE ID: IE.NPWS.PS.NATURA2000.SPA.IE0004030

Map delivered as PDF in electronic format (optional)

- [ ] Yes
- [X] No

Reference(s) to the original map used for the digitalisation of the electronic boundaries (optional).

SITE SYNOPSIS

SITE NAME: CORK HARBOUR SPA

SITE CODE: 004030

Cork Harbour is a large, sheltered bay system, with several river estuaries - principally those of the Rivers Lee, Douglas, Owenboy and Owennacurra. The SPA site comprises most of the main intertidal areas of Cork Harbour, including all of the North Channel, the Douglas River Estuary, inner Lough Mahon, Monkstown Creek, Lough Beg, the Owenboy River Estuary, Whitegate Bay, Ringabella Creek and the Rostellan and Poulnabibe inlets.

Owing to the sheltered conditions, the intertidal flats are often muddy in character. These muds support a range of macro-invertebrates, notably *Macoma balthica*, *Scrobicularia plana*, *Hydrobia ulvae*, *Nepthys hombergi*, *Nereis diversicolor* and *Corophium volutator*. Green algae species occur on the flats, especially *Ulva* spp. Cordgrass (*Spartina* spp.) has colonised the intertidal flats in places, especially where good shelter exists, such as at Rossleague and Belvelly in the North Channel. Salt marshes are scattered through the site and these provide high tide roosts for the birds. Some shallow bay water is included in the site. Rostellan Lake is a small brackish lake that is used by swans throughout the winter. The site also includes some marginal wet grassland areas used by feeding and roosting birds.

The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Little Grebe, Great Crested Grebe, Cormorant, Grey Heron, Shelduck, Wigeon, Teal, Mallard, Pintail, Shoveler, Red-breasted Merganser, Oystercatcher, Golden Plover, Grey Plover, Lapwing, Dunlin, Black-tailed Godwit, Bar-tailed Godwit, Curlew, Redshank, Greenshank, Black-headed Gull, Common Gull, Lesser Black-backed Gull and Common Tern. The site is also of special conservation interest for holding an assemblage of over 20,000 wintering waterbirds. The E.U. Birds Directive pays particular attention to wetlands and, as these form part of this SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds.

Cork Harbour is an internationally important wetland site, regularly supporting in excess of 20,000 wintering waterfowl. Of particular note is that the site supports internationally important populations of Black-tailed Godwit (1,896) and Redshank (2,149) - all figures given are five year mean peaks for the period 1995/96 to 1999/2000. Nationally important populations of the following 19 species occur: Little Grebe (57), Great Crested Grebe (253), Cormorant (521), Grey Heron (80), Shelduck (2,009), Wigeon (1,791), Teal (1,065), Mallard (513), Pintail (57), Shoveler (103), Red-breasted Merganser (121), Oystercatcher (1,809), Golden Plover (3,342), Grey Plover (95), Lapwing (7,569), Dunlin (9,621), Bar-tailed Godwit (233), Curlew (2,237) and Greenshank (46). The Shelduck population is the largest in the country (over 10% of national total). Other species using the site include Mute Swan (38), Whooper Swan (5), Pochard (72), Gadwall

(6), Tufted Duck (64), Goldeneye (21), Coot (53), Ringed Plover (73), Knot (26) and Turnstone (113). Cork Harbour is an important site for gulls in winter and autumn, especially Black-headed Gull (3,640), Common Gull (1,562) and Lesser Black-backed Gull (783), all of which occur in numbers of national importance. Little Egret and Mediterranean Gull, two species which have recently colonised Ireland, also occur at this site.

A range of passage waders occurs regularly in autumn, including such species as Ruff (5-10), Spotted Redshank (1-5) and Green Sandpiper (1-5). Numbers vary between years and usually a few of each of these species over-winter.

Cork Harbour has a nationally important breeding colony of Common Tern (102 pairs in 1995). The birds have nested in Cork Harbour since about 1970, and since 1983 on various artificial structures, notably derelict steel barges and the roof of a Martello Tower. The birds are monitored annually and the chicks are ringed.

Cork Harbour is of major ornithological significance, being of international importance both for the total numbers of wintering birds (i.e. > 20,000) and also for its populations of Black-tailed Godwit and Redshank. In addition, it supports nationally important wintering populations of 22 species, as well as a nationally important breeding colony of Common Tern. Several of the species which occur regularly are listed on Annex I of the E.U. Birds Directive, i.e. Whooper Swan, Little Egret, Golden Plover, Bar-tailed Godwit, Ruff, Mediterranean Gull and Common Tern. The site provides both feeding and roosting sites for the various bird species that use it. Cork Harbour is also a Ramsar Convention site and part of Cork Harbour SPA is a Wildfowl Sanctuary.

Appendix D Preliminary Construction Environment Management Plan

Construction Environmental Management Plan

Residential Development
Lahardane / Ballincolly
Ballyvolane
Co. Cork

November 2019

Document Control Sheet

Client:	Longview Estates Ltd
Project Number:	17066HD
Project Title:	Longview Estates Housing Development
Document Title:	Construction Environmental Management Plan (CEMP)
Document No.:	LHD_CMP_D01

Revision	Status	Author	Reviewed by	Approved by	Date
00	Preliminary Draft	K. Manley	S. Moriarty	K. Manley	14/10/2019
01	Client DRAFT Issue	K.Manley	G.Whelton	K.Manley	13/11/2019
02	Client Issue	K.Manley	G.Whelton	K.Manley	18/11/2019
03	Client Issue – Rev1	K.Manley	G.Whelton	K.Manley	25/11/2019
04	Client Issue – Rev 2	K. Manley	G. Whelton	K. Manley	26/11/2019

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Carraig Mór House,
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Email: info@mhl.ie

Contents

1.0 INTRODUCTION

1.1 Overview

The purpose of this Preliminary Construction Environmental Management Plan is to provide details on how the proposed Longview Residential Development project is intending to use a comprehensive and integrated approach to protecting the environment during construction on site.
The report details the specific requirements that need to be addressed during the project and includes the related roles and responsibilities of individuals involved in the project. It identifies the environmental considerations associated with the construction process and outlines proposed work practices, management, mitigation and monitoring strategies to ensure the project is carried out in accordance with best practice, minimum impact on the surrounding environment and maximum safety throughout the duration of the scheme.
This plan includes the projects Preliminary Construction and Demolition Waste Management Plan. The aim of this preliminary plan is to provide a framework for the development of the full Construction and Waste Management Plan (C&D WMP) to ensure that optimum levels of waste reduction, reuse and recycling are achieved throughout the duration of the project.
The Contractor appointed to undertake the works shall be responsible for the development of this plan and the implementation of all necessary protocols and measures to ensure regulatory compliance, including the provision of data to Cork City Council to enable fulfilment of reporting obligations.

1.2 Site Location

The application site is located on land adjacent to the R614 Ballyhooly Road, less than 3km north of Cork City Centre in the suburbs of Ballyvolane. The site currently comprises agricultural open land and is bound to the north by a local road (L-2976-0) linking the Ballyhooly Road to Rathcooney Village. The cross-roads known locally as 'White's Cross' is 1km north of the proposed main access to the scheme. The R635 North Ring Road is approximately 1.5km south of the development lands and facilitates wider access to the National Primary Network serving Cork City.

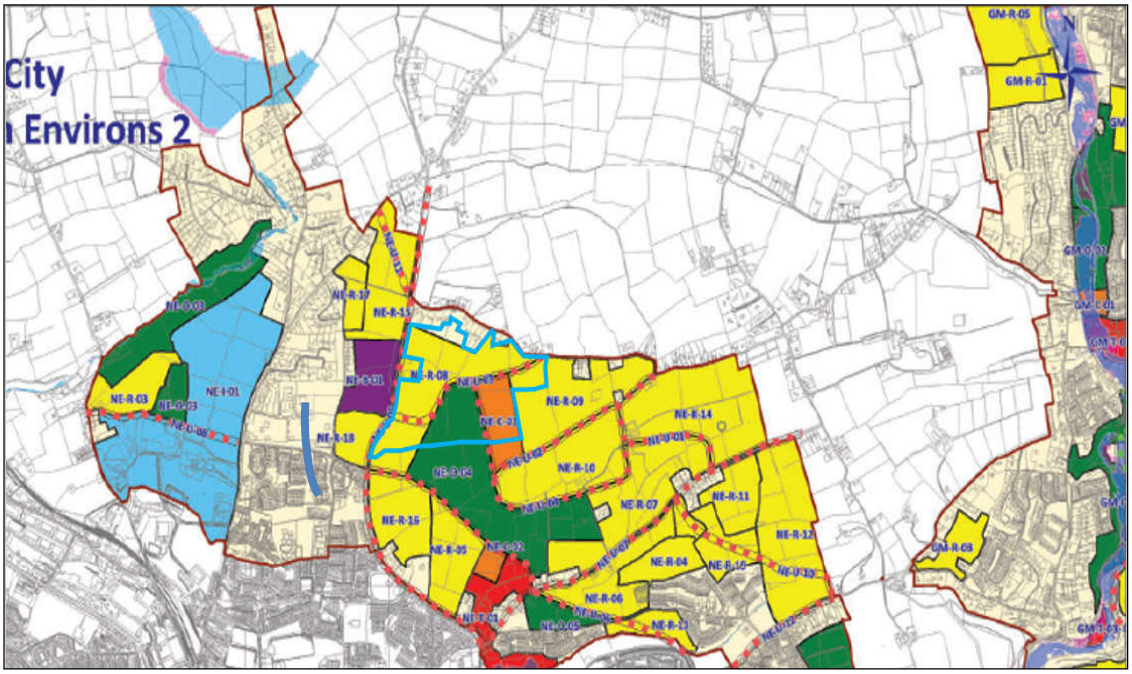


Fig 1: Site Location (Taken from LAP - outlined in blue)

1.3 Scope

The subject development seeks planning permission for the following principal components:

- Construction of 753 residential units made up of a mixture of individual housing and apartments with associated green space and Park Land.
- On site vehicle Distributor Road and streets with associated car parking provision serving individual neighbourhoods.
- A mix of independent pedestrian and cyclist infrastructure together with shared street spaces.
- Drainage and water supply infrastructure to accommodate the residential status of the site.
- Lighting, power and communications infrastructure to accommodate the residential status of the site.
- Off-site localised road and junction improvements.
- Ancillary site development works consist of the diversion of the existing 38 kV ESB overhead electrical cables.
- The increase in capacity of the existing foul network via installation of new pumping station along Ballyhooly Road
- The extension of existing water supply services from a point to the west on Dublin Hill

The following figure presents the proposed site layout the subject of this planning application:

Fig 2: Proposed Site Layout

1.4 Site Specific Details

The site is situated on a west-facing slope and the design involves the levelling of parts of the site via excavation to create a number of development platforms for the various neighbourhoods. Detailed cut/fill quantities have been provided for the different phases of the scheme and are included in the accompanying Engineering Design Report. Preliminary Site investigation has been carried out to determine the reusability of excavated earthworks materials, groundwater profiles and seepage from cut areas on the site. This information has been used to inform an earthworks management plan details of which are included in this report.

1.5 Invasive Species

There are no invasive species recorded on site. An Invasive Species management plan will nevertheless be put in place so as manage the spread of any such species and prevent them entering the site. Japanese Knotweed has been identified on lands west of the site and an extermination programme for that has been initiated by ‘’JK Ireland”. No works are proposed in areas where Japanese Knotweed is present.

2.0 PROJECT RESPONSIBILITIES

2.1 Assignment of Responsibilities

The Contractor appointed by Longview Estates Ltd. to undertake the construction works, shall be responsible for developing, and managing, the project specific Construction Environmental Management Plan (CEMP) incorporating the methodologies described in this preliminary plan.
With respect to waste volumes, while this preliminary plan endeavours to provide representative quantities, it should be noted that the estimated volumes should be developed further as the project progresses. Similarly, the proposed methodologies described in this report are indicative only. Logistical issues, such as traffic restrictions and available space for storage, manoeuvres etc. may necessitate certain revisions.
The Contractor's Project Manager will be responsible for the overall implementation of the plan and associated procedures. The Project Manager will ensure that reporting and recording requirements are met and all necessary resources are in place to support the implementation of the plan.
To ensure the CEMP remains 'fit for purpose' for the duration of the project it should be reviewed and updated by the Project Manager during the life of the project to ensure that it remains suitable to facilitate efficient and effective delivery of the project environmental commitments. The environmental review would, consider past performance from inspections, audit report and monitoring data, plan actions required to mitigate forthcoming risks and disseminate best practice.

The anticipated roles and responsibilities of the key parties involved in the implementing the CEMP are set out below. The roles and responsibilities outlined below are indicative at this stage.

Personnel	Role	Duties/Responsibilities
PROJECT MANAGER	Liaises with the Project Team in assigning duties and responsibilities in relation to the CEMP to individual members of the main contractor's project team.	• Implementing of the Construction and Environmental Management Plan • Implementing the Health and Safety Plan • Management of the construction project • Liaison with the client/developer • Liaison with the Project Team • Assigning duties and responsibilities in relation to the CEMP • Production of construction schedule • Materials procurement • Maintaining a site project diary
CONSTRUCTION MANAGER	Liaises with the Environmental Manager when preparing site works where there is a risk of environmental damage and manages the construction personnel and general works.	• Implementing the Construction Environmental Management Plan. • Assigned Project Management Duties. • Implementing the Health and Safety Plan under the direction of the PSCS • Liaison with the Process Contractors. • Monitoring the Construction Schedule. • Maintaining a Site Project Diary. • Assisting in maintaining the Site Queries and Complaints Register.

ENVIRONMENTAL MANAGER	Ensures that the CEMP is developed, implemented and maintained.	• Implementing the Environmental Procedures of the CEMP and updating it as necessary. • Management of all Environmental aspects of the Construction Works and Audit of Controls. • Review and Approval of Method Statements relating to Environmental aspects. • Ensuring Implementation of Mitigation Measures. • Training of Staff in all Environmental issues. • Liaison with Construction Manager.
PROJECT ECOLOGIST	The Project Ecologist will report to the Environmental Officer and is responsible for advising on all ecological monitoring activities	The responsibilities and duties of the Project Ecologist will include the following: • Pre –commences works surveys, where relevant • Ensure the appropriate course of action is taken in the event that sensitive flora or fauna species are identified
ALL SITE PERSONNEL		The site personnel appointed by the Contractor are responsible for: • Adhering to the relevant Environmental Control Measures and relevant site-specific Method Statements • Adhering to the Health and Safety Plan • Reporting immediately to the Environmental Manager and Construction Manager any incidents where there has been a breach of agreed procedures

The Contractor shall designate a Site Engineer/Manager/Assistant Manager as the Construction Waste Manager and who will have overall responsibility for the implementation of the Project Waste Management Plan (WMP). The Waste Manager will have the authority to instruct all site personnel to comply with the specific provisions of the Plan.
A technically competent person will also be required to assess waste arisings and determine classification in accordance with the Hazardous Waste List.
At operational level, a foreman from the Contractor and appropriate personnel from each sub-contractor on the site shall be assigned the direct responsibility to ensure that the discrete operations stated in the Project WMP are performed on an on-going basis.

Where the need arises, The Contractor, shall employ the services of an approved Specialist Waste Management Sub-Contractor to assist with the safe management and disposal of contaminated waste materials. They shall specialize in the investigation of such material, the carrying out of sampling and testing of hazardous material and the preparation of treatment and disposal methodologies.
A report and method statement is to be prepared by the Contractor, in consultation with their approved Waste Management Specialist Sub-Contractor, for the safe removal and disposal of the identified hazardous materials.
This must be agreed with the Employers Representative prior to commencement of any excavation activities.

2.2 Reporting

The Site Manager / Project Manager is responsible for collating and maintaining all reporting. This would include all environmental and compliance documentation. The following tables will need to be populated as part of the Project CEMP and placed in a prominent location, accessible to the general public and site staff.

Contractor Contacts

Position Title:	Name:	Phone:	Email:
Project Manager			
Construction Manager*			
Environmental Manager*			
Safety (PSCS)*			
Safety Officer*			
Site Emergency Number*			

**24 hour contact details required*

Employer Contacts

Organisation:	Position:	Name:	Phone:	Email:
Safety (PSDP)	Overall Project PSDP			
Employers Public Liaison Officer	Project Liaison Officer			
Employers Ecologist	Project Ecologist			
Employers Archaeologist	Project Archaeologist			

Third Party Contacts

Organisation:	Position:	Name:	Phone:	Email Address:
Inland Fisheries Ireland				
National Parks and Wildlife Service				
Environmental Protection Agency				
Local authority				
Department of the Environment, Heritage and Local Government				
Health and Safety Authority				
Emergency Services				
Other, as appropriate.				

2.3 Training and Awareness

An initial Site Environmental Induction and ongoing Training will be provided to communicate the main provisions of the Environmental Plan to all Site Personnel.

Two-way communication will be encouraged to promote a culture of Environmental Protection. The following outlines some of the information which must be communicated to Site Staff:

- Environmental Procedures of the C.E.M.P.
- Environmental Buffers and Exclusion Zones
- Housekeeping of Materials and Waste Storage Areas
- Environmental Emergency Response Plan
- Reporting Procedures

2.4 Environmental Performance Indicators

The Project Contractor will outline the key performance indicators for the site in gauging successful site management in the prevention of pollution and the protection of the environment. Environmental performance indicators will at a minimum include:

- Number of environmental accidents/incidents logged;
- Breach of procedure and corrective actions;
- Number of environmental complaints received;
- Results of dust monitoring;
- Results of noise and vibration monitoring, and
- Results of site audits.

The performance indicators will be finalized by the Contractor and communicated to all relevant personnel and sub-contractors. The review periods for analyzing site performance indicators must also be specified.

2.5 Environmental Incidents / Complaints Procedure

In the event of an environmental incident, or breach of procedure, or where a complaint is received, the contributing factors are to be investigated, and remedial action taken as necessary. The Main Contractor will ensure that the following response actions will take place:

- The Project Manager must be informed of any incident, breach of procedure and/or complaint received, and details must be recorded in the incident/complaint register
- The Project Manager is to conduct/co-ordinate an investigation to determine the potential influence that could have led to the non-compliance.
- The Project Manager is to notify and liaise with the appropriate site personnel where required, e.g. Site Environmental Manager, Project Ecologist Project Archaeologist
- If necessary, the Project Manager will inform the appropriate regulatory authority. The appropriate regulatory authority will depend on the nature of the incident.
- The details of the incident will be recorded on an Incident / Complaints Form which is to record information such as the cause, extent, actions and remedial measures used following the incident/complaint. The form will also include any recommendations made to avoid re-occurrence of the incident.
- The Project Manager will be responsible for any corrective actions required as a result of the incident e.g. an investigative report, formulation of alternative construction methods or environmental sampling, and will advise the Main Contractor as appropriate.
- The Site Project Manager is to ensure that the relevant environmental management plans/procedures are revised and updated as necessary.

2.6 Environmental Targets and Objectives

Targets

- Zero pollution incidents
- Segregation of site waste to include timber, general waste and other materials
- Completion of environmental checklists as required
- Fuel spill kit to be present on each site at all times
- Maintain all waste licences and waste transfer notes for all waste movements including contractors

Reporting Specific Objectives

- Environmental incidences to be reported to Site Manager without delay
- The following documentation will be reported to Cork City Council on a 4-weekly basis:
    - Environmental incidents and nonconformities raised, including nature, status, corrective and preventive actions and potential for statutory intervention;
    - Key environmental issues raised by others;
    - Significant environmental incidents;
    - Complaints and the current status of those complaints;
    - Actions or interventions undertaken by enforcement organisations;

Site Specific Objectives

- Reduce waste, water and energy use on the project including within all of the site offices;
- Ensure that everyone complies with the environmental requirements in the contract;
- Seek ways to incorporate environmental opportunities within the design (Preliminary Site Investigation);
- Seek ways to reduce the carbon footprint of the contract;
- Reduce the amount of construction waste and excavated material generated which goes to landfill;
- Zero pollution incidents onsite;
- Recycle construction waste where possible;
- Maximise beneficial reuse of the materials: and
- Ensure that all waste documentation (waste transfer dockets, permits etc.) is available for inspection at the site office / in head office.

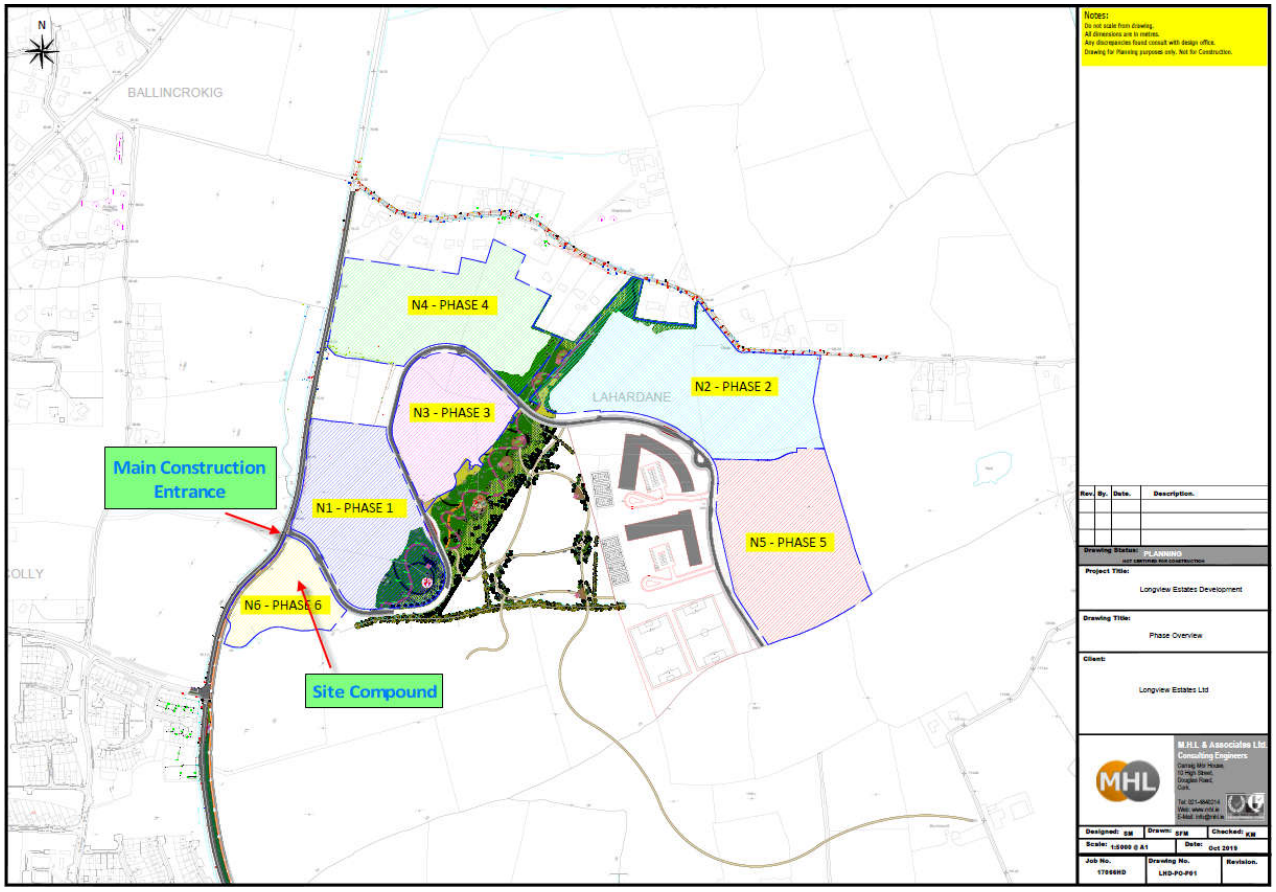
3.0 CONSTRUCTION MANAGEMENT

3.1 Introduction

3.1.1 Phasing of Works

The proposed application is for a 10-year permission for the delivery of 753 residential units, 103 child creche and local retail area. The works are proposed to be carried out on a phased basis commencing with Neighbourhood 1 (N1) and finalizing with Neighbourhood 6 (N6). A scheme plan showing the various neighbourhoods and related phases is shown in the following figure as well as the location of the proposed compound and the main construction access from the Ballyhooly Road.

Fig 3.1: Phasing Diagram



3.1.2 Construction Stage Methodology

Having regard to the scope of the site works and processes, a detailed scheme of works is described in the following sub-sections.

3.1.2.1 Pre-commencement Activities

Before works commences a number of preparatory activities will be carried out. The following key works will be undertaken as part of the site preparation and pre-development activities:

Pre-Commencement Surveys:

- Prior to any commencement of any physical works, a professional land surveyor shall be appointed to carry out demarcation works and establish bench-marks on site. Upon obtaining all the necessary survey data, a joint survey to check existing ground levels shall be carried out with the consulting

engineers.

- Any detailed ground investigations required to support the site regrading process will be carried out and finalized.
- Any pre-commencement archaeological survey.
- Pre- commencement noise survey.
- Pre- commencement dust survey.

Enabling Works:

- The initial enabling works, to be carried out in accordance with the Project specific CEMP (Traffic Management, control of surface water, storage of materials etc.), will be in developing the main access road off the R614 Ballyhooly Road to facilitate construction access to the site. These works will involve the excavation of the main distributor road facilitating access to N1 and N6.
- This will be followed by bulk excavation works in the area designated for the compound, ref **Fig 3.1: Phasing Diagram**. These works will create a level platform, accessible from the main distributor road, upon which the site compound and materials storage area will be constructed.

Temporary Site Compound

Once the main entrance is in place and the bulk excavation has reached the appropriate stage, the contractor will set up their temporary construction facilities, ref. **Fig 3.2 Site Compound**.

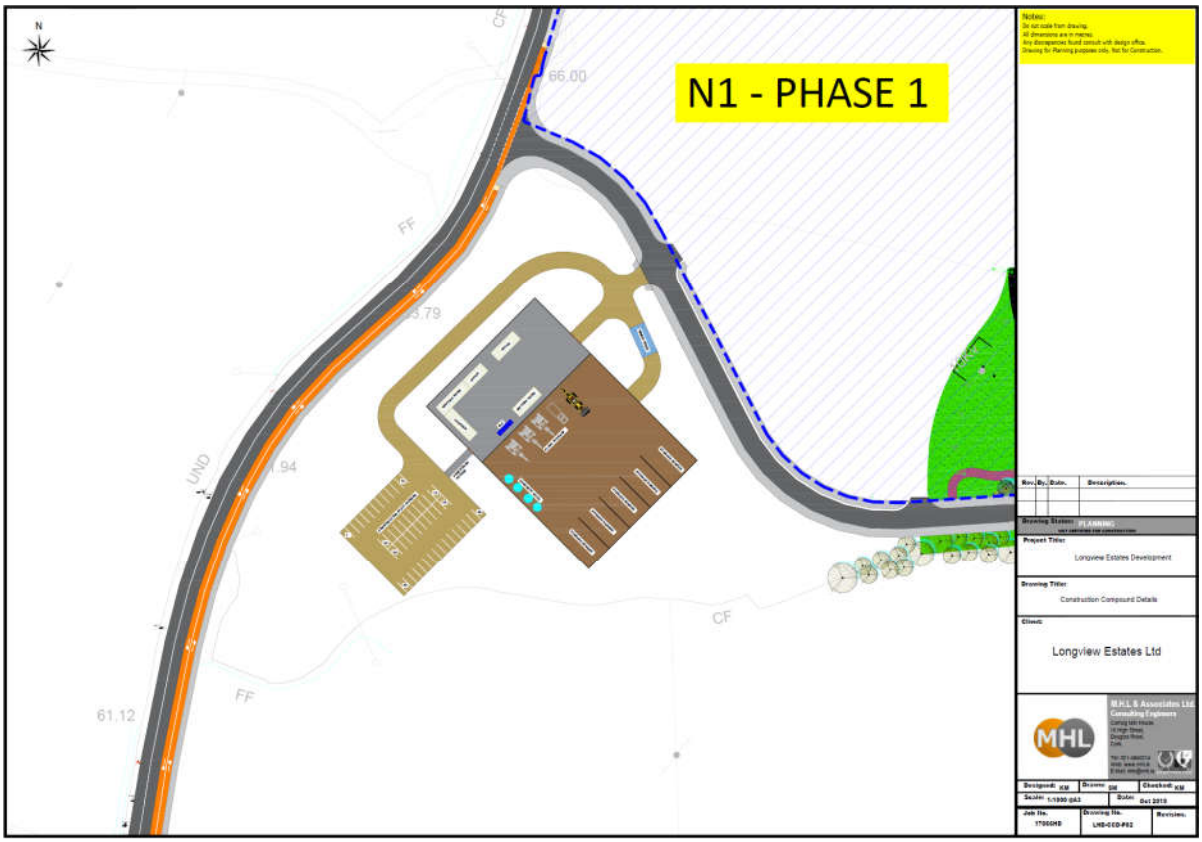
These will include:

- Site offices, canteen and toilet / changing facilities c/w temporary water supplies and wastewater treatment unit.
- Secure compound and containers for storage of materials and plant.
- Temporary vehicle parking areas.
- Contained area for machinery refueling and construction chemical storage.
- Contained area for washing out of concrete and mortar trucks.
- Wheel-washing facilities for vehicles leaving the site.

A security/heras fencing will be provided at the main Ballyhooly Rd road entrance. All vehicles and personnel will be checked on entry to ensure no unauthorized access or fly-tipping will occur within the site. Heras fencing will also be provided on all boundaries to adjoining lands.

Water supply for the construction facilities will be taken from the mains supply which is adjacent to the site. Power for the pumps and small power requirements for construction activities will be supplied from diesel generators until such time as the permanent site power supply is available.

Fig 3.2: Proposed Site Compound



3.1.2.2 Phased Based Construction

The construction of N1 will commence once all regulatory notices have been issued to the relevant authorities. The following processes will be repeated for each phase of development and will be carried out in accordance with the requirements of the adopted CEMP:

Bulk Excavation:

- Following the topsoil strip of N1, the main access road serving this neighbourhood will be constructed to formation level followed by the excavation of the housing platforms to the right of this road. Suitable structural fill material arising from these works will be used to fill the housing platforms to the left and excess suitable fill material will be stored locally to be used in the continuation of the main distributor road.
- Having established the desired site levels during the early works, the next phase of construction will involve the digging of the foundations for each of the buildings. The civil and structural design for each building will determine the location and extent of foundations that are required to support each of the buildings. The foundations for each building will be excavated to the desired size and depth in preparation for the pouring of concrete.

Civil Works:

- The initial civil concrete works will involve the pouring of the foundations for each of the prepared buildings in this phase. Once the foundations are poured and have cured it will allow the building envelope to be erected.
- It is envisaged that a timber frame construction process will be used which will imply the delivery of pre-formed timber walls and trusses to site followed by external finishing material such as blockwork, brickwork, plaster and roof tiles.

- Construction materials will be sourced locally where possible. This will be based on the necessary constraints of performance, durability and cost.
- External Services including water mains, foul sewers, storm sewers, roads, footpaths and public lighting will be carried out in conjunction with the completion of the units.
- All buildings will be constructed in accordance with current building regulations and certified by an appropriated qualified engineer during and after construction.

Landscaping:

- In tandem with the other construction activities being carried out on the buildings, elements of the sites landscaping plan will be progressed. The formation of landscape features will take place in parallel to the early works, utilising material excavated during the cut and fill exercise. As the site build progresses the landscape works will begin to focus on the soft landscaping aspects such as establishment of green zones and walkways, as well as planting of trees and shrubs in designated areas.

3.1.2.3 Construction Impact Assessment

The potential impacts of the construction process have been considered by each separate discipline including materials and quantities associated with the re-grading works.

The following mitigation measures are proposed where potentially significant negative impacts have been identified:

- The moving and storage of excess material has been kept to a minimum and has informed the phased delivery of the scheme, N1-N2-N3-N4-N5-N6.
- Excavated material is to be stored on-site as outlined in the following earthworks plan **Fig 3.3, Earthworks Storage**, to be re-used for later stages of the development.
- The preliminary site investigation has identified that certain quantities of subsoil will require soil strengthening methods for re-use as structural fill. These works will be carried out on site within the designated area. This area will include provisions to control the run-off of storm water.
- Given the topography of the site control measures to protect surface waters from contamination will be put in place prior to the commencement of any site works.
- Where it is necessary to cross the existing watercourse with an undergrounded 38KV ESB cable specific measures such as directional drilling will be undertaken and carefully managed and monitored. These works will be undertaken by ESB Networks using their approved methods.

3.1.2.4 Control of Surface Water Run-off

The control measures relating to surface water run-off during the construction phase of the development shall follow best practice as recommended by CIRA 2010 and ISO 14001:2015 – Environmental Management Systems and C741 Environmental good practice on site guide (4th edition) and CIRIA (2015) Coastal and marine environmental site guide (second edition) (C744).

Measures to be considered will consist of:

- Surface water directed to settlement ponds where after it will be allowed to percolate to ground or allowed to discharge to the existing watercourse. In

rare occurrences it may be removed by tanker to a designated waste-water treatment plant if excessive build-up of surface water on site is noted.

- Protection of any surface water gullies or drains by the use of silt fences.
- Develop on-site bund structures (possibly using existing ditches) to retain any surface waters on site and to prevent direct runoff from the site.
- Minimal and short-term storage and the removal of excess materials (soil, stones and construction wastes) off site in an efficient manner if they arise.
- Daily checks of surface water regime on site and logging of same.
- Works associated with excavations or earth moving not to be undertaken in periods of forecasted bad weather.
- Drainage channels beside construction roadways to direct surface water to settlement areas and allow for natural percolation to ground.
- Ensure good housekeeping is maintained at all times during the construction phase including regular site clean-ups and use of appropriate bins.
- The storage of any chemical or fuel/oils are maintained in temporary bunded storage areas and plant is re-fueled via delivery trucks rather than the storage of large quantities of fuel on site in a designated bunded area.
- The pouring of concrete, application of chemicals, painting or any other activity that has the possibility of being toxic to aquatic life should be undertaken in a control and isolated manner, preventing the possibility of any pathway to a surface water source.

3.2 Hours of Working (Hours of Site Operation)

Works will occur within the hours:
07.00am – 07.00pm* (Monday – Friday inclusive)
07.00am – 4.00pm* (Saturday)
There will be no work on Sunday and Bank Holidays.

* *The working day may extend at times when critical elements of work need to be advanced. Longer working days can occur when there is a planned concrete pour. If extended working hours are required, these will be discussed and agreed with Cork City Council. Accordingly, traffic generated by core construction personnel will be mainly during the off-peaks and will not have a significant adverse impact on the road network.*

3.3 Site Storage

Materials for inclusion as part of the works will be stored generally within the allocated compound. No products will be placed outside of this area. Materials will be brought to site periodically to suit the programme for the works.

Earthworks arising will be stored within the agreed space and will be sampled, processed and placed within the works or removed off site in accordance with the Preliminary Waste Management Plan (Section 4 of this report).

3.4 Noise

The Contractor shall comply with the general recommendations set out in the Code of Practice BS 5228: “Noise Control on Construction and Open Sites” together with the specific requirements described below.
The Contractor shall employ the “best practicable means” to minimise noise and vibration from the site and compound and shall pay particular attention to the selection of the most appropriate available plant to ensure that neighbourhood noise (as defined in BS 5228 Part I, Section 3) is kept to a minimum.

All vehicles and mechanical plant used for the purpose of the Works shall be fitted with effective exhaust silencers and shall be maintained in good and efficient working order. In addition, all diesel engine powered plant shall be fitted with effective air intake silences.

The noise level limits within the Site shall be as per Table 3 below.

Table 3-1 Noise Levels

Assessment Category & Threshold Value Period (L_{Aeq})	Threshold Value, Decibels (dB)		
	Category A [A]	Category B [B]	Category C [C]
Night-Time (23:00 to 07:00hrs)	45	50	55
Evenings & Weekends [D]	55	60	65
Daytime (07:00 - 19:00) & Saturdays (07:00 - 13:00)	65	70	75

A) Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are less than these values.

B) Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are the same as category A values.

C) Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are higher than category B values.

D) 19:00 - 23:00 weekdays, 13:00 - 23:00 Saturdays and 07:00 - 23:00 Sundays.

All compressors shall be “sound reduced” models fitted with properly lined and sealed acoustic overs which shall be kept closed whenever the machines are in use. All ancillary pneumatic percussive tools shall be fitted with mufflers or silencers of the type recommended by the manufacturers, and where commercially available, dampened tools and accessories shall be used.

Machines in intermittent use shall be shut down in the intervening periods between work.

All ancillary plant, such as generators and pumps, shall be positioned so as to cause minimum noise disturbance. If operating outside the normal working week, acoustic enclosures shall be provided.

As outlined in the preliminary site investigation report rock encountered on-site is ‘rip-able’. This will ensure that rock breaking will be kept to a minimal. Blasting of rock is not anticipated.

Times and noise levels at noise sensitive areas resulting from any operation by the Contractor or any Sub-Contractor, on or off the site and concerned in any with the Contractor, shall not exceed those listed in the Table above.
A Construction Noise Management Plan will be put in place for the construction process, a third-party consultant will be engaged to prepare this report and monitor activity and noise levels generated. The Noise Management Plan will address the following areas;

A baseline noise monitoring program will be completed prior to construction works commencing. Attended noise monitoring will be carried out at a number of locations yet to be determined. Survey details, procedures and results of this aspect of the baseline noise monitoring program will be in general in accordance with ISO 1996: Part 2: 2007 2.

Consideration will also be given to advise in relation to establishing significant construction noise effects as set out in BS5228. During the construction phase, the development shall comply with British Standard 5228 ‘Noise Control on Construction and open sites Part 1. Code of practice for basic information and procedures for noise control.’

BS 5228 include guidance on the various aspects of construction site noise mitigation, including, but not limited to:

- Liaison with neighbours
- Noise monitoring
- Hours of works
- Selection of quiet plant
- Control of noise sources and screening

Noise control audits will be conducted at regular intervals through the construction phase of the development. In the first instance it is envisaged that such audits will take place monthly. This is subject to review and the frequency of audits may be increased if deemed necessary.
The purpose of the audits will be to ensure that all appropriate steps are being taken to control construction noise emissions. To this end, consideration will be given to issues such as the following:

- Hours of operation being correctly observed
- Opportunities for noise control 'at source'
- Optimum siting of plant items
- Plant items being left to run unnecessarily
- Correct use of proprietary noise control measures
- Materials handling
- Poor maintenance
- Correct use of screening provided and opportunities for provision of additional screening

3.4 Dust Management Plan

The Contractor shall take all necessary steps to control dust caused by construction traffic. This will include measures such as:

- Wetting of haul road and storage areas;
- Covering or dousing of any dry, imported or excavated material;
- Reducing the duration for stockpiling in fill materials;
- Use of a wheel-wash for construction traffic.

The objective of dust control at the site is to ensure that no significant nuisance occurs at nearby sensitive receptors. To develop a workable and transparent dust control strategy, the following framework plan has been formulated by drawing on best practice guidance from Ireland, the UK and the USA. Effective site management regarding dust emissions will be ensured by the formulation of a dust management plan (DMP) for the site.

The key features of the DMP are:

- the specification of a site policy on dust;
- the identification of the site management responsibilities for dust;
- the development of documented systems for managing site practices and implementing management controls;
- the development of means by which the performance of the dust management plan can be assessed.

The aim is to ensure good site management by avoiding dust becoming airborne at source. This will be done through good design and effective control strategies.

At the planning stage, the siting of construction activities and storage piles will take note of the location of sensitive receptors and prevailing wind directions to minimise the potential for significant dust nuisance.
In addition, good site management will include the ability to respond to adverse weather conditions by either restricting operations on-site or using effective control measures quickly before the potential for nuisance occurs:

- During working hours, technical staff shall be on site and available to monitor dust control methods as appropriate;
- Complaint registers will be kept on site detailing any telephone calls and letters of complaint received about construction activities, together with details of any remedial actions carried out;
- It is the responsibility of the contractor always to demonstrate full compliance with the dust control conditions herein;
- At all times, the procedures put in place will be strictly monitored and assessed.

The dust minimisation measures shall be reviewed at regular intervals during the construction phase to ensure the effectiveness of the procedures in place and to maintain the goal of minimisation of dust using best practice and procedures. In the event of dust nuisance occurring outside the site boundary, site activities will be reviewed and satisfactory procedures implemented to rectify the problem. Specific dust control measures to be employed are highlighted below.

Site roads (particularly unpaved) can be a significant source of fugitive dust from construction sites if control measures are not in place. However, effective control measures can easily be enforced. The most effective means of suppressing dust emissions from unpaved roads is to apply speed restrictions.

- A speed restriction of 20 km/hr will be applied as an effective control measure for dust for on-site vehicles;
- Bowsers will be available during periods of dry weather throughout the construction period. The bowser will operate during dry periods to ensure that unpaved areas are kept moist. The required application frequency will vary according to soil type, weather conditions and vehicular use;
- Any hard surface roads will be swept to remove mud and aggregate materials from their surface while any unsurfaced roads shall be restricted to essential site traffic only.
- Land clearing / earth-moving during periods of high winds and dry weather conditions can be a significant source of dust.
- During dry and windy periods, and when there is a likelihood of dust nuisance, a bowser will operate to ensure moisture content is high enough to increase the stability of the soil and thus suppress dust.

The location and moisture content of storage piles are important factors which determine their potential for dust emissions:

- Overburden material will be protected from exposure to wind by storing the material in sheltered regions of the site;
- Regular watering will take place to ensure the moisture content is high enough to increase the stability of the soil and thus suppress dust. The regular watering of stockpiles has been found to have an 80% control efficiency.

Spillage and blow-off of debris, aggregates and fine material onto public roads should be reduced to a minimum by employing the following measures:

- Vehicles delivering material with potential for dust emissions to an off-site location shall be enclosed or covered with tarpaulin always to restrict the escape of dust;
- Public roads outside the site shall be regularly inspected for cleanliness, as a minimum daily, and cleaned as necessary. A road sweeper will be made available to ensure that public roads are kept free of debris.
- If practicable, a wheel wash facility will be employed at the exit of the site so that traffic leaving the site compound will not generate dust or cause the build-up of aggregates and fine material in the public domain (refer **Site Compound Plan**).

The pro-active control of fugitive dust will ensure that the prevention of significant emissions, rather than an inefficient attempt to control them once they have been released, will contribute towards the achievement of no dust nuisance occurring during the construction phase. The key features with respect to the control of dust will be:

- The specification of a site policy on dust and the identification of the site management responsibilities for dust issues;
- The development of a documented system for managing site practices with regard to dust control;
- The development of a means by which the performance of the dust minimisation plan can be monitored and assessed;
- The specification of the measures to be taken to control dust emissions before it occurs and effective measures to deal with any complaints received.

3.5 Construction Access

Construction Access to the site will be from the R614 Ballyhooly Road via the proposed main Distributor Road serving the site.
The Main Distributor Road will be excavated to formation level and constructed to basecourse level which will be temporarily surface dressed subject to the completion of overall development. The main surface water drainage in this area will also be provided as part of the initial enabling works.

A secondary access serving Neighbourhood 4 (Phase 4) will be constructed from the R614 Ballyhooly Road at the location of the proposed permanent entrance to this section of the site. It is envisioned that the major earthworks element of Phase 4 will be carried out through internal haul routes prior to this access being in place.

3.6 Liaison

The Project Manager, will be responsible for project strategic liaison whilst the Construction Manager will be responsible for day to day liaison and logistics for all the construction related activities. Both will be permanently based on site with the Construction Manager as the first point of contact for all concerns, issues and complaints. A display board will be erected outside the site, which as minimum will identify key personnel contact addresses and telephone numbers.

Newsletters, liaison meetings, progress photos, organised site visits are all methods by which the successful contractor will communicate how they intend to carry out the works and keep people informed.

3.7 Site Specific Traffic Management Plans (TMP's)

The successful Contractor will develop a Construction Stage Temporary Traffic Management Plan in compliance with the Preliminary Temporary Traffic Management Plan developed in consultation with Cork City Council Roads & Transportation Department.

All public roads, accesses, drains, ditches and grips will be kept clear of all dirt, mud and material arising from the execution and completion of the Works and suitable clearing equipment and labour will be provided by the Contractor for this purpose. Attention will also be given to the loading of lorries carrying bulk materials into the Site to ensure that these will not be overloaded or loaded in such a way that spillage is avoided. Any dirt or mud adhering to the tyres or chassis of any vehicles will be thoroughly cleaned off before the vehicle is permitted to leave the Site. In the case of delivery to the Site, vehicles will be thoroughly cleaned before they leave the point of collection. The Contractor will be equally responsible for the vehicles of his sub-contractors and suppliers and the like.

The Contractor will allow for the installation and maintenance of an automatic wheel-washing unit on the entrance to the site (Refer to Site Compound Layout). This will be available for use at all times. Maintenance will include for cleaning out of the equipment and disposal of any material gathered within. The Contractor must ensure that the required equipment for supplying water and power to the wheel washing facility are available and in good working order. At the end of the Contract, the Contractor must remove the wheel washing facilities in total from site.

3.8 Complaints

The Complaints that may be received will be logged, assessed and appropriate action taken as soon as practical. The successful Contractor will be actively seeking liaison with all parties throughout the construction periods. It will be critical to the success of the project that key issues are properly addressed from the outset to create a good working relationship and an integrated team approach to resolving potential issues before they arise.

3.9 Vehicle Movement & Deliveries

Deliveries will be co-ordinated to prevent queuing of vehicles adversely affecting traffic flow and to minimise disruption to local traffic. They will be timed and coordinated to avoid conflict with collection of waste, other deliveries (particularly adjoining land-owners) and rush hour traffic (AM & PM peak hours as identified in the Traffic & Transportation report). Large deliveries will be scheduled outside peak hours to minimise disruption but will require the approval of the Employer's Representative.
The Contractor will consider out of hours deliveries and collections to facilitate the smooth continuation of works and minimise disruption.

3.10 Site Security and Hoarding?

As identified in the Site Compound Layout drawing access to the site will be strictly controlled with an on-site security person logging entry and exits. This will include all on-site personnel. These measures will be developed in conjunction with the Project Supervisor Construction Stage.

3.11 Road Safety

Measures to keep pedestrians and vehicles adequately separated will be implemented on-site. This is of particular importance for the proposed development as it is proposed for the public to occupy the site as individual phases are complete.

The following actions will help be taken to keep pedestrians and vehicles apart:

- Entrances and exits - The Main Contractor will provide separate entry and exit gateways for pedestrians and vehicles with a gate man in attendance to interface

with the traffic and public to facilitate safe access and egress of vehicles.

- Walkways - firm, level, well-drained pedestrian walkways will be provided.
- Crossings - where walkways cross roadways, The Contractor will provide a clearly signed and lit crossing point where drivers and pedestrians can see each other clearly;
- Visibility - The Main Contractor will make sure drivers driving out onto public roads can see both ways along the footway before they move on to it;
- Obstructions - The Main Contractor will not block walkways so that pedestrians must step onto the roadway
- The Main Contractor will take steps to make sure that all workers are fit and competent to operate the vehicles, machines and attachments they use on site.
- People who direct vehicle movements will be trained and authorized to do so.
- Aids for drivers - Mirrors, CCTV cameras or reversing alarms will be provided that can help drivers see movement all-round the vehicle;
- Banksmen will be appointed to control maneuvers and who are trained in the task;
- Lighting – The site will be properly lit so that drivers and pedestrians on shared routes can see each other easily. Lighting may be needed after sunset or in bad weather;
- Clothing - Pedestrians on site will wear high visibility clothing.
- Signs and instructions
- The Contractor will make sure that all drivers and pedestrians know and understand the routes and traffic rules on site. Use standard road signs where appropriate.
- The Contractor will provide induction training for drivers, workers and visitors and send instructions out to visitors before their visit.
- The Contractor will make sure that all the drivers and their supply chain personnel are competent and have relevant training and certification appropriate for their job.

3.12 Plant & Equipment

The typical Plant and Equipment to be employed during the construction works are listed in Table 3.2 below.

Plant Item	Purpose
Hydraulic excavators – various	Excavation, substructures, drainage
Mobile cranes- various	Erection of buildings, movement of large materials and plant
Dumpers	Excavations, drainage, landscaping, movement of materials
Concrete saw cutting	Used for cutting concrete slabs in yard areas, building substructure and superstructures.
Volvo dump trucks	Removal of demolition materials off site
Ready-mix concrete trucks	Delivery of concrete to site for new structures, slabs, etc.
Pump unit for ready-mix concrete	For placement of concrete.
Vibrating rollers	Used for compacting stone in roads, yard areas, substructures etc.
HGV – 20 foot trailers	Delivery of materials, steel, cladding, concrete blocks

HGV – 40 foot trailers	Delivery of structural steel, cladding, large elements of new plant and equipment
Telescopic site handlers	Handling and moving materials on site
Road sweeping equipment	Management of dust and excavation residues on site and off site on road approaches.
Welding gear	Demolitions, erection of structural steel and in mechanical installations
Elevation platforms	For use by employees erecting steel, cladding and general construction at height.
Small tools – grinders, saws, drills, kango hammers, powerfloats, temporary lights, water pumps, concrete vibrators	For use during all stages of construction

Table 3.2 List of typical plant required for this Project

4.0 WASTE ARISING'S & MANAGEMENT

4.1 Analysis of Waste Arising from the Construction Stage

It is anticipated that a significant amount of material arising from the works will be classified for re-use as fill material under roads and pavements. The objective is to ensure the absolute minimum amount of material leaves the site as waste.

The following main waste arisings, including surplus materials, which are likely to be generated during the project are presented in Table 4.1 hereunder.

Waste Type	European Waste Classification Code	Waste Classification
Concrete Kerbs	17 01 01	Non-hazardous
Concrete (ex. roads)	17 01 01	Non-hazardous
Concrete (ex. footpaths)	17 01 01	Non-hazardous
Soil and Stones	17 05 04	Non-hazardous
Scrap Metal	17 04 05	Non-hazardous
Bitumen / Tarmacadam	17 03 02	Non-hazardous
Surplus Cabling	17 04 11	Non-hazardous
Plastic Pipe Cut-offs	17 02 03	Non-hazardous
Biodegradable Garden and Parks Waste	20 02 01	Non-hazardous
Plastic Packaging	15 01 02	Non-hazardous
Paper and Cardboard Packaging	15 01 01	Non-hazardous
Mixed Municipal Waste	20 03 01	Non-hazardous

Table 4-1 Main Waste Types & EWC Codes

For the purposes of this plan it is assumed that all of the soil and stone waste arising from the project will be categorised as non-hazardous and will be kept on-site. The initial site investigation report carried out by Priority Geotech, has identified soil strengthening methods that are to be utilised to ensure excavated granular material will be used as aggregate construction material.
Top-soil excavated will be stored for re-use on the site and in the area designated Parks.

During the construction phase, typical wastes arising include:

- Excavation wastes
- Construction waste from building materials such as Off Cuts of Metal and Insulation
- Pipe Off Cuts, Wrapping, Insulation, Weld Rods
- Materials Wrapping
- Oils, Filters and Cleaning Materials
- Food Waste, Packaging Materials, Dry Recyclables
- Metal, Wire
- Wash Out from Trucks

All wastes will be managed, collected, stored and segregated in separate areas and removed off site by a licensed waste management contractor at regular intervals during the works. All concrete trucks will have to return to their respective yards for washout.

4.2 Types of Materials

As with most construction projects, the materials required for this development will include imported stone, masonry and concrete. The principal construction materials will be:

- Concrete, sub-structures, Ground Floor, Timber Floors.
- Steel reinforcement used in concrete.
- Structural steelwork used for equipment support, roof structure, hand railings.
- Partitions incorporating studwork and panelled walls.
- Secondary steel work.
- Masonry concrete block work.
- Stone fill.
- Pre-cast timber frame units.

4.3 Opportunities for Re-use/Recycling

Material arising from site clearance works will be stored at different locations according to material identification: (The following figure presents the proposed location of stockpiles generated from the different phases based on excess material being generated. **Table 4.2** presents the estimated quantities of materials to be generated per phase of development. The precise location of stockpiles will be identified at construction phase):

- Stockpile 1 - excavated top-soils
- Stockpile 2 - excavated sub-soils suitable for reuse as structural fill
- Stockpile 3 - excavated materials unsuitable for reuse as structural fill

Removed topsoil will be kept separate from the general spoil. All turfs and topsoil will be stored on geotextile matting. Once deposited, the topsoil will be trafficked to the minimum possible extent to prevent damage and dusting.

Stockpiled sub-soils will be located in an area away from drainage ditches and will be bunded on the down gradient edges with a silt curtain or other suitable materials to reduce risk of silt run-off.

All excavated material is being proposed for the purposes of filling or general landscaping on site. However, should any surplus or rejected excavated material be generated, it is to be transported off the site to an approved waste facility. It will be tested in advance of disposal to verify the acceptability of the constituents.

Summary			Cut Breakdown		
Description	**Cut (m3)**	**Fill (m3)**	Topsoil	Subsoil	Rock
Main Distributor Road	33025.15	28830.26	6758.158	17621.66	8645.337
Neighbourhood 1	58223.55	12171.37	7448.902	30180.86	20593.79
Neighbourhood 2	12923.79	33821.76	5843.401	6305.963	774.425
Neighbourhood 3	17088.67	38556.4	4220.603	8655.356	4212.708
Neighbourhood 4	31270.01	22554.65	7708.464	15569.45	7992.096
Neighbourhood 5	16701	11741.69	10940.72	5755.966	4.312
Neighbourhood 6	17600.46	4760.655	2695.258	6229.607	8675.59
Subtotal	**186832.6**	**152436.8**	45615.51	90318.86	50898.26

Table 4.2 Breakdown of Materials to be generated per Neighbourhood

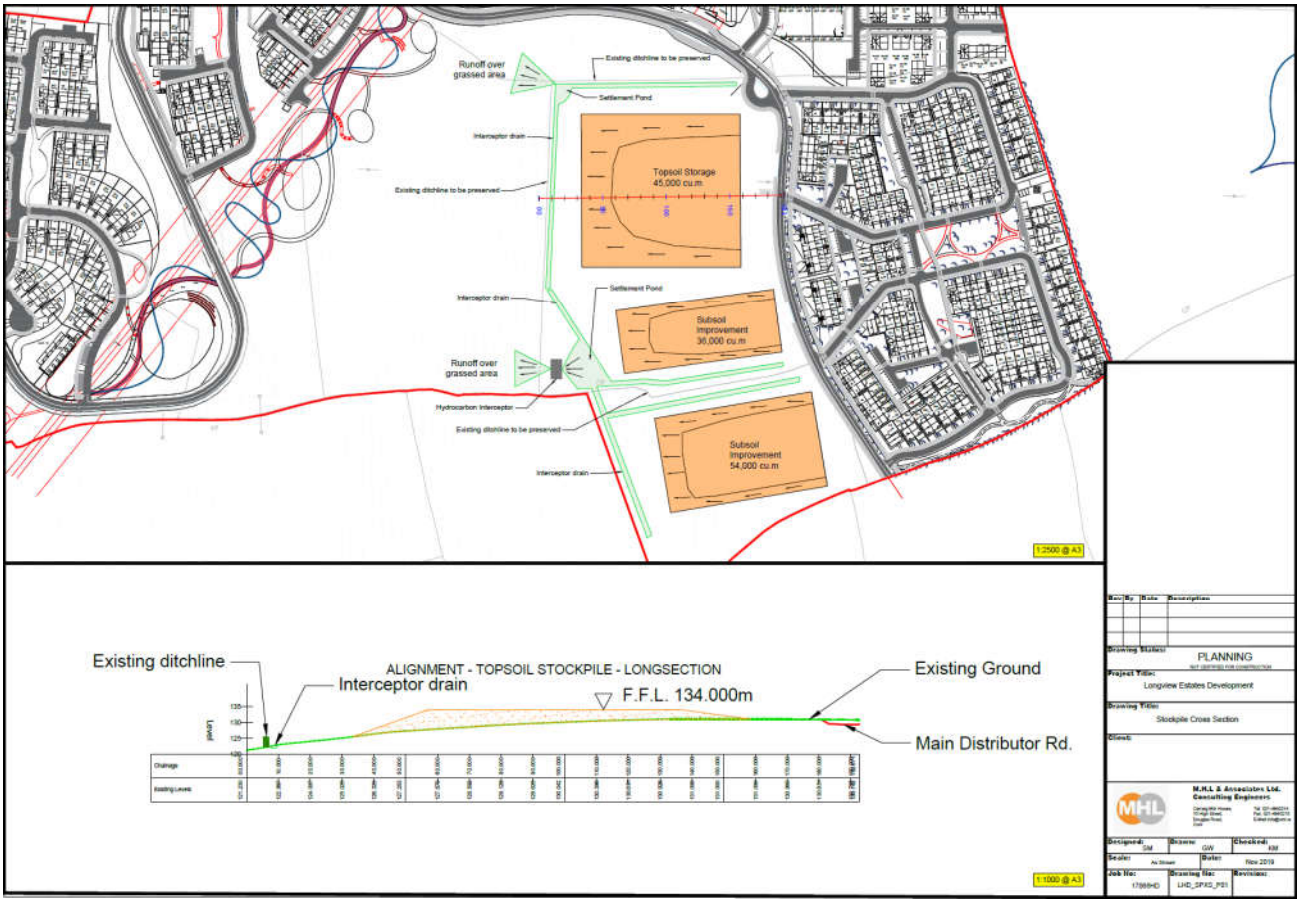


Fig 4.1: Proposed Stockpile Locations

5.0 Environmental Issues & Management Requirements

An environmental review of the proposed scheme will be undertaken and Environmental Management procedures (EMPs) will be implemented for managing the environmental impacts of Activities associated with the development Project. (Refer to **Table 5.1 below and Appendix 1**). The environmental management procedures (EMPs) will set out the principles to be adhered to and outline commitments and measures that are to be implemented during the works to ensure that potential environmental impacts and disturbance to local residents will be minimized or eliminated.

Once appointed, it is the Contractor's responsibility, to update and add (where required) the project specific control measures relevant to the environmental management procedures. The control measures will only be amended by improvement with regards to environmental protection and will take cognizance of any additional Environmental Commitments arising from planning conditions or technical investigations carried out as part of the pre-commencement stage. The Contractor will ensure that plans/procedures are communicated to all site staff, including sub- contractors, through induction, training and at relevant meetings.

Ref:	Procedure:-
EMP-1	Fuel and Oil Management
EMP-2	Construction Traffic Management
EMP-3	Waste Management
EMP-4	Noise Management
EMP-5	Dust Management
EMP-6	Site Environmental Training and Awareness
EMP-7	Environmental Emergency Response
EMP-8	Monitoring and Auditing Procedure
EMP-9	Environmental Accidents, Incidents and Corrective Actions Procedure
EMP-10	Environmental Complaints Procedure
EMP-11	Odour Control Procedure
EMP-12	Light Pollution Control Measures
EMP-13	Surface Water Management and Run-off Control Measures

Table 5.1 Environmental Management Procedures (Refer Appendix 1)

Appendix 1- Environmental Management Procedures

EMP-1 Fuel and Oil Management

EMP-2 Construction Traffic Management

EMP-3 Waste Management

EMP-4 Noise Management

EMP-5 Dust Management

EMP-6 Site Environmental Training and Awareness

EMP-7 Environmental Emergency Response

EMP-8 Monitoring and Auditing Procedure

EMP-9 Environmental Accidents, Incidents and Corrective Actions Procedure

EMP-10 Environmental Complaints Procedure

EMP-11 Odour Control Procedure

EMP-12 Light Pollution Control Measures

EMP-13 Surface Water Management and Run-off Control Measures

EMP 1	FUEL AND OIL MANAGEMENT PROCEDURE
Purpose	Measures for the management of all fuels on site for the protection of ground and watercourses from any spills.
Responsibility of Control	Environmental Manager Construction Project Manager
Procedure	<u>Refueling</u> • Refueling will be carried out using 110% capacity double bunded mobile bowsers. The refueling bowser will be operated by trained personnel. The bowser will have spill containment equipment which the operators will be fully trained in using. • Plant nappies or absorbent mats to be place under refueling point during all refueling to absorb drips. • Mobile bowsers, tanks and drums should be stored in secure, impermeable storage area, away from drains and open water; • To reduce the potential for oil leaks, only vehicles and machinery will be allowed onto the site that are mechanically sound. An up to date service record will be required from the main contractor. • Potential leaks from delivery vehicles will be reduced by visually inspecting all vehicles for major leaks. • Should there be an oil leak or spill, the leak or spill will be contained immediately using oil spill kits; the nearby dirty water drain outlet will be blocked with an oil absorbent boom until the fuel/oil spill has been cleaned up and all oil and any contaminated material removed from the area. This contaminated material will be properly disposed of in a licensed facility. • The Environmental Manager will be immediately informed of the oil leak/spill, and will assess the cause and the management of the clean-up of the leak or spill. They will inspect nearby drains for the presence of oil, and initiate the clean-up if necessary. • Immediate action will be facilitated by easy access to oil spill kits. An oil spill kit that includes absorbing pads and socks will be kept at the site compound and also in site vehicles and machinery. • Correct action in the event of a leak or spill will be facilitated by training all vehicle/machinery operators in the use of the spill kits and the correct containment and cleaning up of oil spills or leaks. This training will be provided by the Environmental Manager at site induction. • In the event of a major oil spill, a company who provide a rapid response emergency service for major fuel spills will be immediately called for assistance, their contact details will be kept in the site office and in the spill kits kept in site vehicles and machinery. **<u>Oil storage</u>** • Fuel containers must be stored within a secondary containment system e.g. bund for static tanks or a drip tray for mobile stores; • Collision with oil stores will be prevented by locating oils within a steel container in a designated area of the site compound away from vehicle movements. • Leakages of oil from oil stores will be prevented by storing these oils in bunded tanks which have a capacity of 110% of the total volume of the stored oil. Ancillary equipment such as hoses and pipes will be contained within the bunded storage container. Taps, nozzles or valves will be fitted with a lock system.

	• The volume of leakages will be prevented through monitoring oil storage tanks/drums for leaks and signs of damage. This will be carried out daily by the Environmental Manager. • Long term storage of waste oils will not be allowed on site. These waste oils will be collected in leak-proof containers and removed from the site for disposal or re-cycling by an approved service provider.
Environmental Controls	• Mobile bowsers, tanks and drums will be stored in secure, impermeable storage area, away from drains and open water. • Fuel containers must be stored within a Secondary Containment System, e.g. bund for static tanks or a drip tray for mobile stores. • Ancillary equipment such as hoses, pipes must be contained within the bund. • Taps, nozzles or valves must be fitted with a Lock System. • Fuel and Oil Stores including tanks and drums must be regularly inspected for leaks and signs of damage. • Only designated Trained Operators are authorized to refuel plant on site and emergency spill kits will be present at equipment for all refueling events. • Procedures and contingency plans will be set up to deal with emergency accidents or spills • Suitable spill response materials and emergency instruction shall be available on site and staff shall have been adequately trained
Monitoring	Daily visual inspection of storage areas for • Damage to containers or ancillary equipment • Leakages • Unlocked storage container

Details of fuel and oil management plan to be finalised by Contractor

EMP 2	TRAFFIC MANAGEMENT
Purpose	Measures for the management of all traffic, including construction traffic and oversized loads, for the minimization of disturbance and nuisance to the local community.
Responsibility of Control	Construction Project Manager Construction Personnel
Procedures	The Contractor will prepare a detailed Traffic Management Plan in response to the Traffic Management requirements set out in this Plan and prior to the Works commencing. • Details on haulage routes to the site • Site access and any site traffic rules must be included, including security, parking, loading and unloading, required speed or other relevant details. • Details of equipment delivery must be provided. • Site operating hours (including delivery) to be outlined. • The Plan must include provision for communicating with the community, and the Local Authority the Gardaí where required.
Environmental Controls	Public Road • In order to mitigate from a significant impact during peak traffic hours, the majority of staff will either arrive on-site before or after the peak morning traffic (8:00-09:00) and finish work before or after the evening peak traffic hours (17:00-18:00). • The condition of the public road will be monitored on an on-going basis and a road sweeper provided to clean the public road if required. Site Entrance • There will be no parking of any vehicles on the public road near the site entrance. • Adequate parking will be provided on site for both employees and visitors. • The condition of the site entrances will be monitored on an on-going basis and a road sweeper provided to clean the public road if required.
Monitoring	Daily checks

Traffic Management Plan to be finalised by Contractor

EMP 3	WASTE MANAGEMENT PROCEDURE
Purpose	Measures for the management of all wastes associated with the Project including all welfare facilities.
Responsibility of Control	Construction Project Manager Environmental Manager
Procedures	The following wastes may be generated during the construction of the project:- • Surplus excavated soils • Waste Fuels; Oil / Diesel • Paper / Cardboard • Non-Hazardous Office and Canteen Waste • Wastewater from Office and Welfare Facilities Wastes must be segregated and stored in the allocated tanks, bins, skips or areas. The Appointed Contractor must finalize all Storage Areas and organize the relevant Licensed Contractors for the appropriate waste collections. The Appointed Contractor must ensure all Permits and Licenses are in place and maintain relevant copies in the Site Office. Wastewater from holding tanks must be collected by an appropriate Licensed Contractor. Construction materials must be stored and managed in a way which promotes waste minimization, including segregating materials for re-use as appropriate.
Environmental Controls	Appropriate waste receptacles will be provided on site.
Monitoring	Daily Visual inspection for • Damage • Untidiness • Full skips

Details of Waste Management Plan to be finalized by Contractor

EMP 4	NOISE MANAGEMENT
Purpose	Measures for the management of impacts surrounding areas to the site, nuisance noise and construction noise impacts. The objective of this plan is to provide a framework for construction noise and vibration management to ensure that noise and vibration levels at neighboring buildings remain within reasonable limits throughout the works.
Responsibility of Control	Construction Project Manager Construction Personnel
Procedures	The Appointed Contractor must prepare a Management Plan to ensure that noise impacts are minimized. The following measures will be communicated to all Staff on site. • All Plant and Machinery will be maintained to ensure noise and air emissions are minimized. • Only use required power and size of equipment • Fit engine exhausts with silencers • Operate equipment in a quiet and efficient manner • Do not leave equipment idling unnecessarily • Regularly inspect and maintain equipment • Use quiet reversing alarms/methods • Use designated routes and access points for deliveries
Environmental Controls	Adequate inspection of plant and equipment in operation shall be carried out to ensure that noise and vibration levels do not exceed those agreed with the Local Authority.
Monitoring	Noise Monitoring at nearest sensitive receptors

Details of Noise Management to be finalized by Contractor

EMP 5	**DUST MANAGEMENT**
Purpose	Measures for the management of impacts on air quality and nuisance dust
Responsibility of Control	Construction Project Manager
Procedures	• All Plant and Machinery will be maintained to reduce dust and airemissions. • Construction personnel must not leave any Plant and Machinery running unnecessarily. • To reduce dust and particular blown around site, dust suppression measures may be implemented in prolonged, dry and windy spell including standard dust suppression (spraying) if relevant. • Stockpiles should be located at suitably sheltered areas to prevent erosion or weathering and shall be located away from drainage ditches. • Public roads in the vicinity of the site will be regularly inspected for cleanliness, and cleaned as necessary. • A temporary vehicle wheel wash facility will be installed in proximity to the site entrance. • The dust minimization plan will be reviewed at regular intervals during the construction phase to ensure the effectiveness of the procedures in place and to maintain the goal of minimization of dust through the use of best practice and procedures.
Environmental Controls	Adherence to dust management measures
Monitoring	Monthly dust deposition monitoring program to be undertaken

Details of Dust Management to be finalized by Contractor

EMP 6	SITE ENVIRONMENTAL TRAINING AND AWARENESS PROCEDURE
Purpose	To describe measures for the training of all Site Personnel in the protection of the Environment and the relevant controls.
Responsibility of Control	Construction Project Manager
Procedures	▪ Environmental awareness and training shall be achieved by: – Site induction, including relevant environmental issues. – Environmental posters and site notices. – Method statement and risk assessment briefings. – Toolbox talks, including instruction on incident response procedures. – Key project specific environmental issues briefings. ▪ All managers and supervisors will be briefed on the CEMP. ▪ Method Statements will be prepared for specific activities prior to the works commencing and will include environmental protection and mitigation measures and emergency preparedness appropriate to the activity covered. The Construction Environmental Manager will review key Method Statements prior to their issue. ▪ Method Statement briefings will be given before personnel carry out key activities for the first time. ▪ Environmental Training Records are to be retained in the Site Office.
Environmental Controls	▪ Site staff shall be competent to perform tasks that have the potential to cause a significant environmental impact. Competence is defined in terms of appropriate education, training and experience.
Monitoring	N/A

Details of Induction and Training to be Finalised by Contractors.

EMP 7	ENVIRONMENTAL EMERGENCY RESPONSE PLAN
Purpose	To describe Measures for the prevention of an Environmental Accident or Incident and the response required to minimize such an event.
Responsibility of Control	Construction Project Manager
Procedures	In the event of an Environmental Emergency, all Personnel will react quickly and adhere to this Procedure (*to be finalized by Contractor).* The following outlines some of the information, on the types of emergency, which must be communicated to Site Staff:- • Release of Hazardous Substance – Fuel or Oil Spill • Flood Event – Extreme Rainfall Event • Environmental Buffers and Exclusion Zones Breach • Housekeeping of Materials and Waste Storage Areas Breach • Stop Work Orders due to Environmental Issue or Concern (threat to Archaeological or Ecological Feature) If any of the above situations occur; the Plan is activated. The Construction Project Manager must be immediately informed and report to the scene. The Construction Project Manager must be aware of the:- • Nature of the Situation – Brief Description of What Has Happened • Location of the Incident • Whether any Spill has been Released • Whether the Situation is under Control
Environmental Controls	All Personnel are to be inducted in the provisions of the Environmental Emergency Response Plan. *Details of Environmental Emergency Response Plan to be finalised by Appointed Contractor. Full Details of the Actual Procedure to include the chain of responsibility, the location of controls (Spills, Kits. Etc. and the Response required to each Situation above and any additional scenarios.*
Monitoring	n/a

Details of Environmental Emergency Response Plan to be finalized by Contractor

EMP 8	MONITORING AND AUDITING PROCEDURE
Purpose	To describe measures for Environmental Monitoring during the Construction Works and audit of control measures to ensure Environmental Protection.
Responsibility of Control	Construction Project Manager Construction Environmental Manager
Procedures	All mitigation measures, any Planning Conditions and relevant Construction Methods will be monitored on site. The Appointed Contractor will provide Audit Checklists to ensure regular checks of the site's Control Measures for the ongoing protection of the environment. Monitoring is to be carried out in adherence with the following:- • Fuel and Oil Management Plan • Waste Management plan • Dust Management Plan • Construction Noise Monitoring Checklists for weekly or monthly Site Audits must be finalised by the Appointed Contractor and the relevant Personnel informed of their duties. Checklists should include (but are not limited to) confirmation that fuel is stored appropriately, that management rules are adhered to, all environmental buffers are maintained, sediment control measures are in place and functioning. Checklists should be finalised with the Contractor's C.E.M.P.
Environmental Controls	Compliance with site management rules
Monitoring	All Environmental Records, including completed Checklists, will be retained at the Site Office.

Details of Monitoring Procedure and Checklists to be Finalised by Contractor in Consultation with the Project Environmental Manager

EMP 9	ENVIRONMENTAL ACCIDENTS, INCIDENTS AND CORRECTIVE ACTIONS PROCEDURE
Purpose	To describe measures for the recording, investigation and close-out of any Environmental Accidents or Incidents on the Site
Responsibility of Control	Project Manager Project Environmental Manager
Procedures	Any Environmental Accidents and Incidents occurring on site during the Works must be reported, recorded and investigated. Any corrective actions must be put in place and closed out after an Accident or Incident occurs. Environmental Accidents and Incidents may include but are not limited to:- • Accidents involving large spill of fuel (Emergency Response required). • Spills of fuel and oil (Minor) • Waste or rubbish left around the site (not in dedicated waste areas) • Failure of any control measures • Unplanned vehicle movement within a buffer zone. If an Environmental Accident or Incident occurs, personnel must inform *Project Manager / Environmental Officer / Nominated Person* immediately. Once the situation is under control, the Environmental Accident or Incident must be recorded and the cause investigated. Any remedial action required must be taken to mitigate any damage and prevent a reoccurrence. Corrective actions must be communicated to Personnel and Sub-Contractors where relevant – particularly where it results in a change in procedure
Environmental Controls	Compliance with site management rules
Monitoring	As required

Details of Environmental Accidents, Incidents and Corrective Actions Procedure, including a chain of responsibility, to be finalised by Contractor and communicated to all Personnel and Sub- Contractors.

EMP 10	ENVIRONMENTAL COMPLAINTS PROCEDURE
Purpose	To describe measures for the recording and resolving of complaints by Third Parties, including Local Residents or Members of the Public.
Responsibility of Control	Project Manager Project Environmental Manager
Procedures	Any Environmental complaints received, whether internal or external, must be recorded and investigated. Immediate action must be taken as relevant to resolve Environmental complaints to avoid any nuisance to the Local Community or Environmental Damage. This Procedure includes;- • Recording of any complaints to the Site Register incorporating communication from the Public. • Follow up by the relevant Site Representative – Environmental Officer. • Remedial Measures where required. • Ongoing communication with complainant to confirm resolution. • Any required Training or communication with Site Personnel and Sub-Contractors as a result.
Environmental Controls	Compliance with site management rules
Monitoring	n/a

EMP 11	ODOUR CONTROL PROCEDURE
Purpose	To describe measures to minimise potential for malodours emissions associated with the works
Responsibility of Control	Project Contractor Project Environmental Manager
Procedures	• Control potential odours during excavation by minimising the working surface area and covering with a clean fill as soon as practical • Should putrescent wastes/soils or materials be unearthed during excavation, a deodoriser might be needed to minimise emissions of malodorous gases to the atmosphere • Transport any odourous wastes in covered vehicles. • Ensure sedimentation ponds and drainage systems are functioning correctly to above becoming stagnant • Ensure sanitary facilities are appropriately maintained and Wastewater from holding tanks routinely collected and removed by an appropriate Licensed Contractor. • Ensure wastes are stored correctly in appropriate waste receptacles • Ensure all wastes, in particular food wastes, are removed from site at regular internal • Ensure all plant is in good working order.
Environmental Controls	Adherence to odour management measures and site management rules
Monitoring	n/a

Details of Odour Control Procedure to be finalized by Contractor

EMP 12	LIGHT POLLUTION CONTROL MEASURES
Purpose	To describe measures to minimise obtrusive light associated with the works on local residents and other sensitive receptors
Responsibility of Control	Project Contractor
Procedures	Where appropriate the following measures will be considered for implementation: • Dim or switch off lights where it is safe to do so • Use low lighting equipment where feasible • Use of timers and sensors for switching off lights/ flood lights • Avoid flood lighting in areas adjacent to sensitive nearby receptors • Light shielding will be considered where light glare is a nuisance • Outdoor artificial lighting for site security should be designed to face downwards and inward to the site and oriented to avoid significant light spill by means of selection of appropriate fitting with filters/screens and with suitable Lux levels.
Environmental Controls	Adherence to light pollution controls and site management rules
Monitoring	n/a

EMP 13	SURFACE WATER MANAGEMENT AND RUN-OFF CONTROL MEASURES
Purpose	Measurements for the control and management of all surface waters associated with the site during construction
Responsibility of Control	Project Contractor
Procedures	Where appropriate the following measures will be considered for implementation: • Implement erosion control to prevent runoff flowing across exposed ground and become polluted by sediments; • Intercept and divert clean water runoff away from construction site runoff to avoid cross-contamination of clean water with soiled water; • Implement the erosion and sediment controls before starting site clearance/construction works; • Minimise area of exposed ground by maintaining existing vegetation that would otherwise be subject to erosion in the vicinity of the development and keeping excavated areas to a minimum; • Install a series of silt fences or other appropriate silt retention measure where there is a risk of erosion runoff to watercourses from construction related activity particularly if working during prolonged wet weather period or if working during intense rainfall event; • Implement sediment control measures that includes for the prevention of runoff from adjacent intact ground that is for the separation of clean and 'dirty' water; • Install appropriate silt control measures such as silt-traps, check dams and sedimentation ponds; • Washout from concrete trucks and plant will not be permitted on site. • Provide recommendations for public road cleaning where needed particularly in the vicinity of drains; • Controls need to be regularly inspected and maintained otherwise a failure may result, such as a build-up of silt or tear in a fence, which will lead to water pollution so controls must work well until the vegetation has re-established; inspection and maintenance is critical after prolonged or intense rainfall; • Develop checklists for weekly Site Audits, which must be finalised by the Appointed Contractor and the relevant Personnel informed of their duties;
Environmental Controls	Adherence to surface water management and run-off control plan and site management rules
Monitoring	Daily visual inspection of controls to ensure appropriately operating