

## 4. Biodiversity

### 4.1. Introduction

This section of the EIAR reports the Ecological Impact Assessment (EclA) undertaken to assess the likely significant effects of the development proposals on ecological resources (habitats, flora, fauna) within and adjacent to the Site and proposed residential development. A Natura Impact Statement (NIS), a formal assessment of the likely effects on designated Sites (Natura 2000), is included as part of this planning application.

#### 4.1.1. Supporting Documents

The following technical reports are appended to this section of the EIAR:

- EIAR Appendix B.1: *'Preliminary Ecological Appraisal (PEA): Haggardstown, Blackrock, Co. Louth'* (Corvus Environmental Consulting Ltd.; March 2018; COR17116/pea final v.2 (March 2019 update));
- EIAR Appendix B.2: *'A Bat, Badger and Invasive Species Assessment of Blackrock, County Louth'* (Brian Keeley B.Sc. (Hons) in Zool. MCIEEM; August 2018); and
- EIAR Appendix B.3: *'Natura Impact Statement (NIS): Haggardstown, Blackrock, Co. Louth'* (Corvus Environmental Consulting Ltd.; March 2019; COR17116/nis final v.6)

The detailed results of Site surveys and assessments, including all plates, figures and tables, are provided within these technical reports. Detailed summaries of the Site survey results and assessments are provided within this section of the EIAR.

#### 4.1.2. Statement of Authority

The Biodiversity assessment has been completed by Mr Gareth E. Grindle B.Sc. (Hons.) M.Sc. L.L.M. M.I.E.E.M. M.I.Env.Sc. Mr Grindle conducted initial field surveys for PEA in late 2017 and early 2018 and the final set of walkover and wintering bird surveys in late 2018 and early 2019. Mr Grindle developed the ecological mitigation strategy and is the primary author of the Biodiversity Chapter of this EIAR and the NIS. Detailed taxa-specific surveys, highlighted as required through the PEA process, were conducted by Mr Brian Keely B.Sc. (Hons) in Zool. MCIEEM in the spring and summer of 2018. EclA, and the ecological mitigation strategy draws heavily on this work. Follow up site visits and field surveys were undertaken by Colin Wilson June 2019 and initial survey findings have been updated where necessary.

Mr Grindle is a Director of Corvus Environmental Consulting Ltd. He holds an Honours degree in Environmental Science (University of Stirling 2000), a Master of Science in Environmental Change (King's College, London 2001) and a Master of Laws in Environmental Law (Queen's University, Belfast 2014). He has over 15 years' professional experience in the public, private and voluntary sectors and is a full member of both the Chartered Institute of Ecology & Environmental Management and the Institution of Environmental Sciences, organisations requiring peer-review for membership and a high standard of professional conduct.

Mr Keely, a highly experienced independent ecologist, holds an Honours degree in Zoology and sits on the Heritage Council bat expert panel. He is a full member of the Chartered Institute of Ecology & Environmental Management, an organisation requiring peer-review for membership and a high standard of professional conduct.

Colin Wilson (Atkins Dublin) has a BSc (Hons) in Environmental Science. He has over 12 years working in the fields of ecology and environmental management. He is a Senior Ecologist with experience in ecological surveying, environmental assessment, on-site ecological supervision and mitigation. He has experience on multiple road projects regarding all elements of surface and groundwater management, monitoring, sampling and associated reporting. Colin also has a broad range of experience in invasive species management, biosecurity and control. Colin has prepared AA screening reports and has also been involved in the development of Environmental Operating Plans and Construction Environmental Management Plans for a number of national infrastructure projects.

### 4.1.3. Sources of Information

The data and information utilised in this Biodiversity Chapter (and the underlying EclA) was sourced directly from Site surveys conducted by Corvus Consulting and Mr Brian Keely, technical reports and drawings prepared on behalf of Kingsbridge Consulting Ltd., and the following public sources:

- National Parks & Wildlife Service (NPWS): [www.npws.ie](http://www.npws.ie); and
- National Biodiversity Data Centre (NBDC): [www.biodiversityireland.ie](http://www.biodiversityireland.ie)

Advanced (final) drafts of all relevant EIAR chapters and appended technical reports were available for review and reference prior to the completion of assessment for EclA and NIS. All data, information, references and other resources utilised during the preparation of the EclA are referenced within the text, or within the appended technical reports, as appropriate.

### 4.1.4. Limitations

While primary habitat surveys were completed outside the optimal season, the Site is dominated by highly modified, homogeneous habitat types of relatively low nature conservation value. This has therefore not affected the robustness of the overall assessment. No difficulties were encountered during Site surveys and assessments, or during the preparation of this section of the EIAR, that would render it incomplete or inaccurate in any way.

### 4.1.5. Legislative Framework and Planning Policy Context

#### 4.1.5.1. EclA – Habitats, Flora, Fauna & Designated Sites

The principal national legislation providing for nature conservation and the protection of biodiversity and wildlife in Ireland is the Wildlife Act 1976, updated by the Wildlife (Amendment) Act 2000 and the European Union (Natural Habitats) Regulations 1997, which themselves have been updated and amended twice (1998 & 2005) and subsequently revised and consolidated as the European Communities (Birds and Natural Habitats) Regulations 2011.

The early legislation provided a solid basis for species protection and pre-empted many requirements of later EU Directives, but habitat and Site protection measures were relatively weak. Following the ratification of various international agreements, including the Bonn and Berne Conventions<sup>2</sup> – international, intergovernmental treaties concerned with the conservation of wildlife and habitats on a global scale – the European Community adopted Council Directive 79/409/EEC on the conservation of wild birds (‘the Wild Birds Directive’ now codified as 2009/147/EC) and Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (‘the Habitats Directive’), now transposed into Irish law, as is set out above. These Directives provide *inter alia* for the protection of species and the habitats of species.

The Wild Birds Directive details special measures to conserve wild birds, with an overall purpose of providing for the protection, management and control of all naturally occurring species and requires the identification of Special Protection Areas (SPA). The Habitats Directive covers habitats and non-avian species of fauna which are of nature conservation importance, in danger of disappearance, and for which the EC has particular responsibility due to global range. Articles 12 to 16 establish a regime of strict protection for the species of flora and fauna listed on Annex IV (European Protected Species), wherever they occur, making it an offence:

- deliberately to capture, injure or kill a wild animal of a European protected species;
- deliberately to disturb such an animal while it is occupying a structure or place which it uses for shelter or protection;
- deliberately to disturb such an animal in such a way as to be likely to—
  - affect the local distribution or abundance of the species to which it belongs;
  - impair its ability to survive, breed or reproduce, or rear or care for its young; or
  - impair its ability to hibernate or migrate;
- deliberately to take or destroy the eggs of such an animal;
- deliberately to obstruct access to a breeding Site or resting place of such an animal; or
- to damage or destroy a breeding Site or resting place of such an animal.

<sup>2</sup> The Convention on the Conservation of Migratory Species of Wild Animals (adopted in 1979; also known as CMS or Bonn Convention); The Convention on the Conservation of European Wildlife and Natural Habitats (adopted in 1979; the Bern Convention)

Several species native to Ireland, including bats and otters, are included in Annex IV and are therefore subject to the regime of strict protection. European Commission guidance<sup>3</sup> has been produced, intended to ensure a common understanding of the respective provisions among national and regional authorities, conservation bodies and other structures responsible for or involved in implementation. The Habitats Directive includes a presumption in favour of conserving Annex I habitats and Annex II species wherever they occur (i.e. protection is not limited to specifically designated SACs).

The Wildlife Act 1976 (as amended) establishes protection for certain species of wild flora and fauna identified on Schedules 3, 4 & 5 and provides for Natural Heritage Areas (NHA), the primary national designation for the protection of wildlife and natural habitats. A range of species including badger, otter, pine marten, red squirrel, hedgehog, stoat, pygmy shrew, hares, bats, deer, lizards, newts, frogs and toads receive protection. The means by which this protection is implemented in practice varies from species to species and by situation depending on the specific requirements of species ecology. Wildlife licenses are required in many situations. The Wildlife Act also provides for general and specific levels of protection for wild birds and fish. Other statutory instruments, such as the Planning and Development Act 2000, as amended; the Flora (Protection) Order 2015; and EU Regulation 1143/2014 on Invasive Alien Species are also relevant.

#### 4.1.5.2. NIS – Natura 2000 Sites

The Wild Birds Directive requires the identification of Special Protection Areas (SPA). The Habitats Directive requires the identification and protection of Special Areas of Conservation (SAC) for Annex I habitats and Annex II species. Article 3 of the Habitats Directive provides for the establishment of a coherent European ecological network of designated Sites ('Natura 2000') comprised of Sites designated, or in the latter stages of designation, under both the Wild Birds and Habitats Directives:

- Special Areas of Conservation (SAC) – Sites notified under the Habitats Directive, which have been adopted by the EC and formally designated by the member state
- Special Protection Areas (SPA) – Sites notified under the Wild Birds Directive, which have been adopted by the EC and formally designated by the member state
- Sites of Community Importance (SCI) – Sites notified under either directive, which have been adopted by the EC, but not yet formally designated by the member state
- Candidate and Proposed Sites – Sites notified under either directive, which have been submitted to the EC, but not yet formally adopted

Article 6(3) of the Habitats Directive establishes the requirement for detailed prior, precautionary assessment of potential impacts on the integrity of the Natura 2000 network and further establishes that national authorities shall agree to the plan or project only once it has been demonstrated that the integrity of any Natura 2000 Site concerned will not be compromised:

#### *Article 6*

*3. Any plan or project not directly connected with or necessary to the management of the Site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the Site in view of the Site's conservation objectives. In the 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) then sets out the procedure for permitting derogation from this strict protection in certain restricted circumstances and when specific conditions are met.

The Habitats Directive is transposed into Irish legislation by the European Communities (Birds and Natural Habitats) Regulations, 2011. The assessment is dealt with in Part 5.

<sup>3</sup> 'Guidance document on the strict protection of animal species of Community interest under the Habitats Directive 92/43/EEC' (EC; February 2007)

## 4.2. Methodology

This section of the EIAR has been prepared in accordance with Environmental Protection Agency (EPA) guidelines:

- ‘Guidelines on the Information to be contained in Environmental Impact Assessments’ (EPA, May 2002);
- ‘Advice Notes on Current Practice (in the preparation of Environmental Impact Assessments)’ (EPA, June 2002); and
- ‘Guidelines on the Information to be Contained in Environmental Impact Assessment Reports’ (Environmental Protection Agency; August 2017 (draft))

The Ecological Impact Assessment (EclA) on which this section of the EIAR is based was completed in line with the CIEEM guidelines:

- ‘Guidelines for Ecological Impact Assessment in the UK and Ireland – Terrestrial, Freshwater, Coastal and Marine’ (Chartered Institute of Ecology and Environmental Management; September 2018).

### 4.2.1. Assessment Methodology – Ecological Impact Assessment (EclA)

The purpose of EclA is to identify and classify the risk/probability of changes, both adverse and beneficial, occurring to baseline ecological conditions as a result of activities associated with development. This is achieved by assessing the likelihood of changes occurring, their likely direction, magnitude and degree of permanence or reversibility, arriving ultimately with a robust and transparent assessment of likely significant effects at appropriate geographical and temporal scales.

The approach is based on the CIEEM Guidelines which establish a framework whereby the significance of predicted impacts upon a valued ecological receptor (VER) may be measured and assessed. There are five main steps in the assessment process:

- i. Establish the ecological baseline.
- ii. Determine the levels of value of VERs.
- iii. Characterise the nature, magnitude and duration of the likely effects.
- iv. Determine the likely significance of these effects.
- v. Assess mitigation and determine overall residual effects.

#### 4.2.1.1. Step 1 – Establishing the Ecological Baseline

Site inspections, detailed field surveys and research were completed to develop an accurate ecological baseline of the Site and surrounding area and establish VERs. Background research, habitat suitability assessments and field surveys of the Site were undertaken by Mr Grindle in February 2018, with supplementary and verification surveys undertaken in October and December 2018 and January and February 2019. Detailed surveys for bats, badgers and invasive flora were completed by Mr Keeley in July and August 2018. Follow up surveys were undertaken by Colin Wilson in June 2019.

Study areas for the various receptors vary in extent according to the sensitivity of the receptor, the extent of influence that the proposed development may be expected to exert beyond the boundaries of the Site and prevailing best practice guidance and survey requirements.

The Site was assessed for broad habitat type and extent by Mr Grindle on 26<sup>th</sup> February 2018 during a Site survey for Preliminary Ecological Appraisal (PEA). The field assessment followed the standard JNCC Phase 1 Habitat Survey methodology.<sup>4</sup> The Site was inspected and classified into broad habitat types, with subsequent assessment of habitat extent and vegetation condition. Habitat types were then classified according to the JNCC methodology, and extent and distribution mapped. Field survey results were augmented with the examination of aerial and Site photographs. Supplementary verification walkover surveys were completed by Mr Grindle in October and December 2018 and January and February 2019.

Background research on bat activity in the area, and habitat/roosting suitability assessments of the Site were undertaken by Mr Grindle in February 2018. A bat detector survey, with additional visual inspections, was undertaken by Mr Keeley on 17<sup>th</sup> July 2018. The Site was examined prior to dusk to

<sup>4</sup> ‘Handbook for Phase 1 Habitat Survey: A Technique for Environmental Audit’ (Joint Nature Conservation Committee; 2007).

identify the potential for roosts, followed by walked transect surveys that covered all the lands proposed for construction and observations of surrounding lands. An *Echometer 3* with a GPS attachment was used in conjunction with a *Pettersson D240X* detector to identify the species of bat present both at the time of the survey and subsequently with sound analysis software (*Batsound Pro* and *Kaleidoscope Pro*).

The Site was surveyed for terrestrial fauna by Mr Grindle on 26<sup>th</sup> February 2018 during the Site survey for PEA with verification walkover surveys completed by Mr Grindle in October and December 2018 and January and February 2019. The surveys focused on badger and otter activity, but the surveyor remained vigilant for field evidence or indications of other protected and notable fauna. The proposed main drainage culvert to the north-east of the Site and other lands under Local Authority control along the R172 Blackrock Road required to implement the scheme were inspected during the late 2018 and early 2019 surveys.

The Site was inspected for diagnostic and forensic field evidence of the presence of badgers such as setts, paths & trails, breach points, paw prints, guard hair, foraging signs, dung and latrines. Trails were followed to locate setts and other field evidence such as latrines and other evidence of territorial marking or dispute. Areas which could not be accessed for close inspection (e.g. areas of dense, impenetrable scrub) were assessed for the likelihood of the presence of setts, based on the density of trails entering the area and other field evidence. Detailed surveys for badgers, to the same methodology, were completed by Mr Keeley in July and August 2018; again, the surveys focused on badgers, but the surveyor remained vigilant for field evidence or indications of other protected and notable fauna.

The main section of the Site does not contain any significant watercourses or stream channels but, as it is close to the coast and contains degraded wetland habitat and suitable terrestrial opportunities, the whole Site was inspected to determine the likelihood of otters being present. The area was searched for diagnostic and forensic field evidence indicative of the presence of otters, such as resting places (holts, hovers, couches and grooming hollows); paths, trails, slides and breach points; paw prints and tracks; spraints, spraint mounds, sign heaps and urination 'green spots'; and feeding/predation remains.

Herpetofauna and avifauna were assessed on the basis of habitat preference, suitability and availability during Site surveys for PEA in February 2018. The presence/absence of wintering SPA species within the Site was addressed during the late 2018 and early 2019 surveys.

#### 4.2.1.2. Step 2 – Assigning Value & Importance to Ecological Resources

Criteria set out in Chapter 4 of the CIEEM Guidelines was employed to determine the levels of value and geographical importance for VERs. Table 4.1 provides examples of the criteria used in determining geographical value. As noted in the guidelines:

- Factors such as legal protection or identification in a Biodiversity Action Plan (BAP) do not automatically indicate any particular level of biodiversity value or nature conservation importance; such factors form part of the consideration.
- Where a VER can be classified in more than one category, the highest classification is applied.
- Various approaches can be adopted for defining local importance (e.g. district, borough/parish or other locally defined areas). In this case 'local' refers to the Site and immediately surrounding area only and 'local (higher value)' applies to all other scales below 'regional'.
- Professional judgment<sup>5</sup> is necessarily employed throughout.

**Table 4.1 - Geographic Valuation of Ecological Receptors**

Value	Example Criteria
<b>International</b>	Any internationally designated Site (SAC, SPA, Ramsar) or candidate/proposed Site, or any area which meets the published selection criteria for such designation, irrespective of whether or not it has yet been notified.  A viable area of a habitat type listed in Annex I of the Habitats Directive, or smaller areas of any such habitat, which are essential to maintain the viability of a larger whole. Annex I priority habitats merit specific additional attention.

<sup>5</sup> Geographic valuation was undertaken in consultation with ATKINS.



	<p>Any regularly occurring nationally significant population of any internationally important species, which is threatened or rare in Ireland, such as those listed on Annexes II or IV of the Habitats Directive, Annex I of the Wild Birds Directive.</p>
<b>National</b>	<p>Nationally designated Sites (NHA, pNHA, Nature Reserves and Refuges for Fauna or Flora, etc.) or any discrete area which meets the published selection criteria for national designation, irrespective of whether or not it has yet been notified.</p> <p>Habitats and species protected at a national level in Ireland, listed in the National Biodiversity Action Plan 2017-2021 and under the Wildlife Acts, 1976 to 2012.</p> <p>A population of any species for which an All-Ireland Species Action Plan (SAP) has been prepared.</p> <p>Important bird areas such as those identified by Birdlife International,</p> <p>A local breeding population of any species of bird with 'red' status on the RSPB/Birdwatch Ireland Birds of Conservation Concern in Ireland (BoCCI) lists.</p> <p>Areas of ancient woodland.</p> <p>Sites, habitats or species identified or targeted for specific action in the All-Ireland Pollinator Plan 2015-2020.</p>
<b>Regional</b>	<p>Any Site designated specifically for its nature conservation interest within Area/County Development Plans.</p> <p>Sites, habitats or species identified or targeted for specific action in County Biodiversity Plans.</p> <p>Features of the landscape which are of major importance for wild flora and fauna, such as those with a 'stepping stone' and ecological corridor function (as per Article 10 of the Habitats Directive).</p> <p>Any regularly occurring, locally significant population of any species identified as being nationally scarce, or any species of flora recorded as occurring in 16-100 10 km grid squares in 1987 – 1999 (New Atlas of the British and Irish Flora).</p> <p>Any regularly occurring, locally significant population of a regionally important species.</p> <p>A local breeding population of any species of bird with 'amber' status on the RSPB/Birdwatch Ireland Birds of Conservation Concern in Ireland (BoCCI) lists.</p> <p>Areas of semi-natural or long-established woodland.</p>
<b>Local (higher)</b>	<p>Any Site designated specifically for its nature conservation interest within Local Biodiversity Action Plans or any Site considered to be locally important for nature conservation interest.</p> <p>Any viable area of a broad habitat type identified within a relevant Local Biodiversity Action Plan, or any other habitat type for which an action plan has been or is being prepared.</p> <p>Other habitats of ecological value in a national to local context (such as those identified as locally important biodiversity areas within Local Biodiversity Action Plans and County Development Plans).</p> <p>Any regularly occurring population of any species identified within a relevant Local Biodiversity Action Plan.</p> <p>A local breeding population of any species of bird with 'green' status on the RSPB/Birdwatch Ireland Birds of Conservation Concern in Ireland (BoCCI) lists.</p> <p>Any regularly occurring population of any floral species recorded as occurring in 70 - 176 10 km grid squares in 1987 – 1999 (New Atlas of the British and Irish Flora).</p> <p>Mature tree-lines, intact hedgerows, ponds, wetlands scrub etc. without any higher classification.</p>
<b>Local (Site)</b>	<p>Any other area of natural or semi-natural habitat or other feature of the natural environment of biodiversity interest or utility to wildlife at a Site level.</p>

#### 4.2.1.3. Step 3 - Characterising the Expected Nature, Magnitude & Duration of Ecological Effects

Initially, potential ecological effects are classified according to whether they may be positive or negative; direct or indirect; and whether they may act in isolation only or also in-combination or cumulatively. In EclA, significant ecological effects are usually reported with the expected duration and reversibility, where an irreversible or permanent effect is one from which natural recovery is not possible within a reasonable timescale or for which there is no reasonable chance of successful intervention. Reversible or temporary effects are those for which recovery is expected, either spontaneously or with intervention/mitigation. Duration applies to reversible effects and refers to the period over which the effect is expected to last prior to recovery or replacement. Magnitude is determined on a quantitative basis, if possible, to provide a robust indication of the level of expected change. Extent refers to the area over which the effect is expected to occur. When assessing habitat change magnitude and extent are often synonymous.

#### 4.2.1.4. Step 4 - Determining the Likely Significance of Ecological Effects

High magnitude effects are of greater (major or above) significance to all but locally important VERs, while low magnitude effects will only be of significance to nationally and internationally important VERs. The example matrix presented in Table 4.2 shows how the magnitude of an impact and geographical valuation are combined to determine the overall level of significance. Table 4.3 then provides definitions of the significance levels.

In line with the scheme set out in Table 4.3, the significance of expected residual (mitigated) ecological effects are associated with levels of acceptability where:

- neutral, *de minimis* and minor adverse effects are not normally of concern;
- moderate adverse effects require careful consideration; and
- major and severe adverse effects are considered to be highly significant, usually warranting refusal of consent or significant re-design.

In the context of environmental impact assessment guidelines any impact assessed to be moderate or major will require further consideration or remedial action / design reassessment respectively.

Professional judgement and experience are applied at every stage of the assessment process. Tables 4.2 and 4.3 are used to ensure consistency throughout.

**Table 4.2 - Significance of Ecological Impacts**

Magnitude	Geographical Value			
	Local	Regional	National	International
Negligible	neutral	neutral	<i>de minimis</i>	<i>de minimis</i>
Low	<i>de minimis</i>	minor	moderate	major
Medium	minor	moderate	major	major
High	moderate	major	major	major
Very High	moderate	major	major	severe

**Table 4.3 – Significance of Ecological Impacts: Definitions**

Impact Assessment	Definition
<b>Major Negative</b>	<p>Fails to satisfy the subject environmental objective and results in major fundamental deterioration of the environmental context at national and international levels of importance.</p> <p>Proposed development/activities will result in a major alteration to the baseline ecological conditions, resulting in fundamental change and major environmental deterioration.</p> <p>Severe adverse impacts are attributed to habitat and species VERs identified as being of International significance.</p>

	Highly significant. Warrants refusal of consent.
<b>Major Negative</b>	<p>Fails to satisfy the subject environmental objective and results in major deterioration of the environmental context.</p> <p>Proposed development/activities will result in a major alteration to the baseline ecological conditions, resulting in fundamental change and major environmental deterioration.</p> <p>Major adverse impacts are attributed to habitat and species VERs identified as being of National/International significance.</p> <p>Highly significant. Warrants refusal of consent.</p>
<b>Moderate Negative</b>	<p>Partly satisfies the subject environmental objective and fails to contribute to the environmental context.</p> <p>Proposed development/activities will result in loss or alteration of one or more features of the baseline ecological conditions resulting in partial environmental change.</p> <p>Moderate adverse effects are attributed to species VERs identified as being of National significance or habitat VERs identified as being of National/Regional significance.</p> <p>Significant. May warrant refusal of consent if not resolvable through careful design or mitigation.</p>
<b>Minor Negative</b>	<p>Satisfies the subject environmental objective but fails to fully contribute to the environmental context.</p> <p>Proposed development/activities will result in minor shifts away from the baseline ecological conditions but should not result in significant environmental change.</p> <p>Not normally of concern providing standard impact minimisation and mitigation guidelines are followed.</p>
<b>de minimis / Neutral</b>	<p>Satisfies the subject environmental objective, but neither contributes to nor detracts from the environmental context.</p> <p>Very remote probability that any effects will occur. Effects, if noticeable, will show a very slight change from the baseline ecological conditions. Difficult to distinguish any environmental change.</p>
<b>Minor Positive</b>	<p>Partly satisfies the subject environmental objective and partly contributes to the environmental context.</p> <p>Proposed development/activities will result in minor improvements to baseline ecological conditions and should result in minor environmental gains.</p> <p>Environmental gains which can easily be achieved through standard practices.</p>
<b>Moderate Positive</b>	<p>Satisfies the subject environmental objective and contributes to the environmental context.</p> <p>Proposed development/activities will result in recognisable improvements to baseline ecological conditions and will result in notable environmental gains.</p> <p>Moderate beneficial effects are attributed to VERs where improvements are expected to be significant.</p> <p>Environmental gains which require detailed design consideration – potentially employed to offset slight/moderate adverse impacts elsewhere.</p>
<b>Major Positive</b>	<p>Satisfies the subject environmental objective and results in a major contribution to the environmental context.</p> <p>Proposed development/activities will result in quantifiable improvements to baseline ecological conditions and will result in significant environmental gains.</p> <p>Major beneficial effects are only attributed to VERs of National or International importance and where benefits are substantial and will result in the consolidation and/or expansion of areas of habitats or ensure the security and/or expansion of viable populations of species.</p> <p>Environmental gains which require very detailed design consideration – potentially employed to eliminate and offset potential significant adverse impacts elsewhere.</p>



#### 4.2.1.5. Step 5 – Mitigation & Overall Residual Ecological Impact

Overall residual, or mitigated, ecological effects are assessed by taking account of any expected beneficial ecological effects and those measures which have been integrated within the development proposals in order to avoid, eliminate or reduce the significance of ecological impacts (and any further recommended measures which attach a high probability of successful implementation). The following widely accepted strategy for mitigation (Chapter 6 of the CIEEM Guidelines) has been employed:

**Table 4.4 - Approach to Mitigation**

<b>Avoidance</b>	Where viable, the project has been re-designed to avoid adverse ecological effects.
<b>Elimination</b>	Where possible and feasible, measures which eliminate adverse ecological effects are employed.
<b>Reduction</b>	Measures intended to reduce the significance of adverse ecological effects are employed where options for avoidance or elimination have been exhausted or are deemed to be impractical.
<b>Compensation</b>	Where adverse ecological effects cannot be avoided or eliminated or reduced in significance to an acceptable level, consideration is given to compensating for residual adverse effects.
<b>Remediation</b>	Where adverse ecological effects are unavoidable, consideration is given to undertaking limiting remedial works.
<b>Enhancement</b>	Consideration is given to providing opportunities for ecological improvement, enhancement and the realisation of beneficial ecological effects.

#### 4.2.1.6. Uncertainty in EclA

In EclA, uncertainty is associated with both the prediction and assessment of environmental effects. The precautionary principle, a central feature of environmental legislation, planning policy and professional guidance, provides a mechanism for managing uncertainty in EclA – the precautionary principle requires that where there is a lack of full scientific certainty, the protection of the environment is prioritised.

Where confidence or uncertainty is expressed, an objectively defined scale, as detailed in Table 4.5,<sup>6</sup> is employed. Decisions as to confidence in predictions are necessarily based primarily on expert judgement.

**Table 4.5 - Confidence & Uncertainty in EclA**

Confidence Level	Details
Certain	Probability estimated at 95% chance or higher.
Probable	Probability estimated at above 50% but below 95%.
Unlikely	Probability estimated at above 5% but below 50%.
Extremely Unlikely	Probability estimated at less than 5%.

<sup>6</sup> The confidence levels employed were originally set out in an earlier (2006) version of the CIEEM guidelines, have been adapted and reproduced in several other guidance documents since then, and are widely applied and accepted in EclA.

## 4.2.2. Assessment Methodology – Natura Impact Statement (NIS)

Assessment pursuant to Article 6(3) of the Habitats Directive Assessment has a narrow focus – it is protection-led, conducted with due regard to the precautionary principle and is concerned exclusively with maintaining the integrity of the Natura 2000 network of Conservation Sites.

In addition to providing a comprehensive standalone assessment, the results of the NIS feed back into the Biodiversity Assessment to ensure that appropriate assessment is conducted as part of the EIAR and to ensure complete assessment for the purposes of EIA. The NIS includes consideration of underpinning/associated national designations (NHA, pNHA). Assessment is completed in accordance with the European Commission and Department of the Environment, Heritage and Local Government guidelines:

- *'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'*.<sup>7</sup>
- *'Managing Natura 2000 Sites, The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC'*.<sup>8</sup>
- *'Appropriate Assessment of Plans and Projects in Ireland Guidance for Planning Authorities'*<sup>9</sup>

The established assessment methodology, in line with legislative requirements, requires a staged approach where the results of each stage determines the requirement for and scope of the subsequent stage:

- **Stage 1 - Screening for Appropriate Assessment:** The process which identifies the potential impacts of the plan or project which are likely to arise on the identified Natura 2000 Sites and determines whether or not these are likely to be significant, in view of the Site's conservation objectives. The precautionary principle must be applied – where significant adverse effects are likely, uncertain or unknown at screening, progression to the second stage is required. Significance is assessed against key indicators such as habitat loss, habitat degradation or fragmentation, species disturbance, species displacement or fragmentation, overall water and ecological quality etc. Mitigation, or other measures designed or envisioned to avoid or reduce the significance of adverse effects, are not taken into account.
- **Stage 2 - Appropriate Assessment (AA):** The detailed, scientific assessment of the likely effects on the integrity of the Natura 2000 Sites. Impacts are assessed alone and in combination with other plans or projects with respect to the structure and function of the Natura 2000 Sites and their published conservation objectives. Where adverse impacts are expected an assessment of the measures envisioned to avoid and/or mitigate impacts is also conducted. The aim of the assessment is to provide sufficient information, evidence and data to the competent authority on which to base their formal AA. The Natura Impact Statement (NIS) is prepared for this purpose.

In a reference from the Irish High Court for a preliminary ruling on the interpretation of Article 6(3) of the Habitats Directive, *People Over Wind and Peter Sweetman v Coillte Teoranta (C-323/17)*, the Court of Justice of the European Union (CJEU) ruled (April 2018) that Article 6(3) must be interpreted as meaning that it is not appropriate to take account of mitigation at the screening stage and, in considering the need for appropriate assessment, the only requirements are:

- the plan or project is not necessary for the management of the Natura 2000 Site; and
- it must be likely to have a significant effect on the Natura 2000 Site.

Conservation Objectives for Natura 2000 Sites, which aim to maintain or restore Site features to favourable conservation status, are published by the National Parks and Wildlife Service (NPWS). The majority of plans and projects are either consented or abandoned following a Stage 1 or Stage 2 assessment. Stages 3 and 4 are concerned with the procedure for consenting despite a negative assessment, in certain restricted circumstances.

<sup>7</sup> [http://ec.europa.eu/environment/nature/natura2000/management/docs/art6/natura\\_2000\\_assess\\_en.pdf](http://ec.europa.eu/environment/nature/natura2000/management/docs/art6/natura_2000_assess_en.pdf)

<sup>8</sup> [http://ec.europa.eu/environment/nature/natura2000/management/docs/art6/provision\\_of\\_art6\\_en.pdf](http://ec.europa.eu/environment/nature/natura2000/management/docs/art6/provision_of_art6_en.pdf)

<sup>9</sup> [https://www.npws.ie/Sites/default/files/publications/pdf/NPWS\\_2009\\_AA\\_Guidance.pdf](https://www.npws.ie/Sites/default/files/publications/pdf/NPWS_2009_AA_Guidance.pdf)

### 4.3. The Receiving Environment – Baseline Conditions

The baseline conditions, for the purposes of the assessment of potential ecological impacts, consists of the Site of the proposed development and the immediately surrounding area as per condition during March 2019.

The full, detailed results of Site surveys, research and assessments are provided in the appended technical reports. The following sections provide detailed summaries and the assigned levels of geographic value for each VER.

#### 4.3.1. The Site and Immediate Surroundings

The proposed residential development is located in a large (c. 17.9 ha) greenfield Site situated to the south of Dundalk and the north of Blackrock, Co. Louth. The Site presents as rural and is in agricultural use, but the wider setting is within a predominantly developed area with low-density housing to the immediate north and south-east and Dundalk Golf Club to the immediate west. Moving further away, the Site, along with the golf course and adjoining agricultural areas, are entirely enclosed to the north, south and west by the extensive urban area of Dundalk/Blackrock and associated main roads and industrial/commercial areas. The R172 Blackrock Road, a coastal thoroughfare which runs along the edge of Dundalk Bay, lies to the east of the Site.

The Site is dominated by large agricultural (arable) fields, in cereal production or winter cover crop at various times during the assessment period, with marginal and peripheral areas of rough, semi-improved grassland. External Site boundaries are marked, for the most part, by hedgerows – variously, managed thorn hedges, non-native garden hedgerows and lines of mature trees or screen planting. Some defunct and patchy sections of hedgerow remain within the Site, marking former internal field divisions. The route for the main Site access runs to the east from the main Site over an area of wet and rough marshy grassland and scrub to join with the R172 Blackrock Road. The Site contains no built structures and, away from the Site boundaries, no mature trees.

The interior of the Site displays very little biologically or structurally diverse habitat and is considered to be of high ecological interest. The arable fields contain some sections of defunct hedgerow and small, isolated, rocky areas which remain uncultivated, with rough grassland and loose scrub cover.

The Site boundaries, and in particular the proposed route for the main access to the Site, do show some semi-natural habitat in the form of hedgerows, mature trees, scrub and marshy grassland but ecological connectivity at a landscape scale is limited to the local, enclosed area of agricultural and recreational lands.

Lands under Local Authority control, along the R172, are required for the implementation of Site drainage and discharge.

#### 4.3.2. Sites Designated for Nature Conservation

The Site is not within any Natura 2000 or nationally designated Site. The Site is located ca. 225m from the western shore of Dundalk Bay, which holds SPA and SAC designations and is also designated as a Ramsar Site and a pNHA. The access/egress road for the proposed development adjoins the R172 Blackrock Road which borders Dundalk Bay designated site. Figure 1 below shows the site in proximity to Dundalk Bay SAC/SPA/Ramsar/pNHA site.

Figure 1: Site Location & Extent in Local Context (Designated Sites)



The main part of the Site is set back from the shore, on elevated ground, at ca. 225m from the designated areas but the proposed main access traverses an area of lower-lying, wet and marshy ground between the main part of the Site and the R172 Blackrock Road which follows the coast and abuts the SPA and SAC boundaries. Lands under Local Authority control, along the R172, are required for the implementation of Site drainage and discharge.

Dundalk Bay is a large open shallow sea bay with extensive saltmarshes and intertidal sand/mudflats, extending some 16km from Castletown River on the Cooley Peninsula, in the north, to Annagassan/Salterstown in the south and encompasses the mouths and estuaries of the Rivers Dee, Glyde, Fane, Castletown and Flurry. As is set out in detail in Chapter 10 of the EIAR, the Site does not contain any significant watercourses or stream channels, but it is close to the coast, contains some degraded wetland fringe habitat and drains naturally, via. groundwater and surface flow, to Dundalk Bay.

The Site is ecologically and hydrologically connected to the designated areas of Dundalk Bay, in so far as adverse impacts on the integrity of the Natura 2000 and national designations may arise. Pathways can be established for potential direct and indirect adverse impacts on Dundalk Bay SPA, Dundalk Bay SAC, Dundalk Bay Ramsar Site and Dundalk Bay pNHA.

### **Designated Sites**

Dundalk Bay was classified as an SPA in November 2003 and updated in September 2017 (Site code IE0004026). It is one of the most important wintering waterfowl Sites in Ireland, regularly supporting more than 20,000 waterbirds. Predominantly a marine Site (97%), the designated area covers approximately 13,238 ha.

Dundalk Bay was classified as an SAC in September 2000 and updated in September 2017 (Site code IE0000455). This is a Site of significant conservation value because it supports good examples of a range of coastal habitats. Predominantly a marine Site (92%), the designated area covers approximately 5,234 ha.

Dundalk Bay was identified as a Ramsar Convention Site in 1996 (Ramsar Site no. 834; 4,768 ha). The Site is a wetland of international importance as an open sea bay with extensive saltmarshes, intertidal sand and mudflats encompassing the estuaries of the four rivers. The Site is internationally important for waterbirds regularly holding over 20,000 birds and supporting over 1% of the Northwest European/East Atlantic Flyway populations of numerous species of waterbirds.



### Natura Impact Statement

The Natura Impact Statement (NIS) is provided as a technical report appended to this section of the EIA:

- EIA Appendix B.3: 'Natura Impact Statement (NIS): Haggardstown, Blackrock, Co. Louth' (Corvus Environmental Consulting Ltd.; March 2019; COR1716/nis final v.6)

Detailed information on the Natura 2000 Sites, including formal designation documentation and conservation objectives, and detailed assessments, including mapping and illustrative photographs, are provided within the NIS. The results of the assessment feed back into and are presented in this Biodiversity Assessment to ensure a complete assessment for the purposes of EIA.

### 4.3.3. Habitats & Flora

The following habitat types (JNCC habitat codes) were identified within the Site:

- J1.1 Arable
- A1.3.2 Woodland – plantation, mixed
- B6 Semi-Improved Grassland (poor)
- A2.1 Scrub – dense
- A2.2 Scrub – scattered, gorse-dominated
- F1 Swamp
- J2 Hedgerows
- J4 Bare Ground

Figure 2 below outlines habitats by area within the site boundary.



#### 4.3.3.1. Protected & Valuable Natural/Semi-Natural Habitats

No habitat types resembling those identified on Annex I of the Habitats Directive were identified within the Site or adjoining areas. The Site is dominated by agricultural fields which have been in arable



production and are of very limited biodiversity interest. Similarly, the coniferous screen planting and ornamental garden hedges on the northern and western boundaries are of limited habitat importance.

The native hedgerows on the eastern boundary, the remaining defunct sections within the Site and those just outside the Site to the south, and the small area of mixed woodland to the east of the Site and the small section in the north-eastern corner are of some inherent ecological value, particularly in the context of an otherwise sterile arable Site. The small section of marshy/swampy grassland to the east of the Site (proposed main Site access/egress) is the only area of notable semi-natural habitat within the construction footprint which is likely to be lost or compromised by development. This area has been hydrologically compromised by adjacent development and land improvement and has experienced significant scrub encroachment but remains of some biodiversity and habitat interest.

Lands in local authority control required for the implementation of Site drainage and discharge comprise sections of the public road and adjoining hedges and marginal grassland on the interface between the road and coastal habitats of Dundalk Bay.

#### 4.3.3.2. Protected Flora

No species of protected (Habitats Directive Annex II, Flora Protection Order 2015) flora were identified within the area surveyed.

#### 4.3.3.3. Invasive Alien Flora

No species of invasive alien flora (Schedule 3, the European Communities (Birds and Natural Habitats) Regulations 2011; EU Regulation 1143/2014 on Invasive Alien Species) were identified within the area surveyed (February, July, August and October 2018).

### 4.3.4. Protected & Notable Terrestrial Fauna

#### 4.3.4.1. Background Research

Broad habitat suitability assessment shows that the Site and surrounding areas are suitable for and likely to support local populations of bats and terrestrial mammals such as badgers, hedgehogs, stoats, hares and possibly otters; habitat is generally unsuitable for herpetofauna although marginal opportunities for frogs are present within the marshy area to the east.

NBDC records confirm that several species of bats, badgers, red squirrels, otters, Irish hares, pine martens, hedgehogs and frogs have been recorded within the relevant 10 km reporting grid square in the last decade, with Irish hare recorded within 2 km in 2011 (likely within the Site or the immediately surrounding area).

#### 4.3.4.2. Bats

Species records and derived landscape importance values returned indicate that terrestrial habitats in this area are of significant local importance for several species. The Site is split between two reporting grid squares – the lower landscape importance values returned for the eastern section are likely heavily influenced by the dominant coastal and marine areas; the higher values returned for the western section are likely more representative of the Site as a whole and adjoining terrestrial areas. However, the bulk of the Site is open and exposed arable land, which is of limited utility to foraging and commuting bats. Activity is likely to be confined to the structurally diverse boundary vegetation, which also present some opportunities for roosting within mature trees and adjacent built structures.

Bats were observed and detected within the Site during surveys conducted in July 2018. The majority of activity was Common pipistrelle *Pipistrellus*, with occasional Soprano pipistrelle *Pipistrellus pygmaeus*, Leisler's bat *Nyctalus leisleri*; a single *Myotis spp.* was also recorded. *P. pipistrellus* activity was recorded throughout the Site but was especially high around the metal barn outside the Site to the east (see Figure 2, Appendix B.2) and along a line of *C. leylandii* screen planting on the northern perimeter. Relatively frequent activity was recorded along the western boundary of the Site where it abuts the adjacent golf course. A single *P. pipistrellus* was noted flying along the internal hedgerow and very briefly over the crop. A single *P. pipistrellus* was noted flying from the *C. leylandii* hedge on the northern perimeter of the Site to a shed slightly to the east of the hedgerow, outside the Site to the north (see Figure 2, Appendix B.2) prior to dawn and was seen to circle this structure several times before disappearing from view.

*P. pygmaeus* were noted around the metal barn to the east of the Site, along the boundary with the golf course and along the northern perimeter at the *C. leylandii* treeline.

The area around the metal barn was noted as an area of relatively high *Pipistrellus spp.* activity immediately prior to the end of the dawn survey – bats were observed feeding or circling before disappearing from view.

*N. leisleri* activity was noted particularly to the west of the Site, close to the golf course. A male bat was heard calling from beyond the north-western corner of the Site, within the golf course, and from trees that line the back avenue to a house, again off Site to the east (see Figure 2, Appendix B.2).

A single *Myotis spp.* was recorded around trees off Site to the east at 23:27 hours and again along the northern boundary *C. leylandii* treeline at 23:39 hours (see Figure 2, Appendix B.2). No *Myotis spp.* were recorded at any other stage. There is a suitable building offsite to the east, close to the metal barn, that would serve as an ideal roost Site for *Myotis spp.* and other bats but no roosting was confirmed.

#### 4.3.4.3. Badgers, Otters & Other Terrestrial Fauna

A local population of badgers were confirmed as active in the area by Mr Grindle in February 2018.

No setts were found within the Site or immediately adjoining areas, but the location of a probable sett was noted in an undisturbed and well-protected location c. 220 m to the south. Mr Keeley found no unambiguous evidence of badger activity within the Site or the adjoining fields in July and August 2018. No snuffle holes, dung pits, latrines, tracks, guard hair etc., and no setts were found or indicated.

The weight of evidence points to the presence of a local social group which makes limited use of the Site for commuting and foraging, particularly during the winter when nights are longer, food is scarce, and movement around the Site is unconstrained by cereal crops. Certainly, there are no setts within the Site or immediately adjoining lands.

No field evidence of otter presence or activity was found within the Site, within immediately adjoining lands or within marginal coastal areas along the R172 which are required for the implementation of Site drainage and discharge.

The Site and adjoining areas show a reasonable level of mammal activity. Badgers, foxes and rabbits were confirmed from field evidence; biological records and habitat suitability/availability suggest very strongly that hares and hedgehogs are present and field evidence of fox and dog activity was found throughout the Site. Hedgehog *Erinaceus europaeus* were confirmed from the Site by Mr Keeley in August 2018 – two individuals were located and photographed in the eastern section of the Site during a bat activity survey.

Figure 3 below details terrestrial mammal survey findings in context with the study area.

#### 4.3.4.4. Herpetofauna

The main portion of the proposed residential development Site is unsuitable for herpetofauna. Marginal opportunities for frogs and possibly newts exist within the small, degraded wetland (marshy grassland and scrub) area to the east of the main Site but no suitable habitat for toads or lizards is present. As no areas of standing water suitable for amphibian breeding were noted within the Site during the February 2018 survey for PEA no specific surveys for frogs or newts were conducted.

Figure 3: Badger Survey - Results (field evidence, February 2018)



### 4.3.5. Avifauna

#### 4.3.5.1. Breeding/Nesting Birds

The interior of the Site provides very little suitable nesting habitat. The cultivated areas are devoid of nesting opportunities other than small, exposed patches of low, loose gorse scrub on the rocky outcrops within the fields. Site boundary vegetation, particularly the thorn hedgerows and woodland to the east and north-east, provide good nesting opportunities and are likely to be exploited by a typical assemblage of nesting passerines during the spring and early summer.

The Site provides no realistic opportunities for waders or other ground-nesting birds. The small area of rough, marshy grassland and scrub to the east of the Site, along the route of the main Site access, is unlikely to be exploited by waders or other coastal/estuarine species. Scrub encroachment, and the proximity of development has compromised the suitability of this area both in terms of habitat structure and the availability of cover and vantage for predators. The lands along the R172 required for Site drainage and discharge are continuous with extensive coastal grassland and inundation habitats within Dundalk Bay which are suitable for wading birds. However, the only areas within the Site to be of any realistic utility for bird species associated with the adjoining SPA are immediately adjacent to the public road and no wading birds were noted close to the road during Site inspections.

#### 4.3.5.2. Wintering Birds

The interior of the Site provides very little, if any, suitable habitat for wintering birds. Arable fields overwintered with stubbles can provide some useful foraging resources for seed-eating passerines, game birds and some ground-nesting species such as skylarks and pipits.

Despite the location and situation of the Site, close to Dundalk Bay, habitats within the Site are generally unsuitable for any significant or habitual use of the Site by waterfowl, particularly the majority of SPA feature species, such as coastal and estuarine ducks, divers and waders, which rarely venture inland during the winter in significant numbers.

Some SPA feature species, particularly gulls and geese, do make use of terrestrial habitats such as open pasture and arable stubbles in coastal locations during the winter and may be present within the Site from time to time but it is considered highly unlikely that any SPA target species are ever present in significant numbers or that the Site is relied upon for foraging or high-tide roosts.

The small area of rough, marshy grassland and scrub to the east of the Site, along the route of the proposed Site access/egress, is unlikely to be exploited by waders or other coastal/estuarine species during the winter. Scrub encroachment, and the proximity of development has compromised the suitability of this area both in terms of habitat structure and the availability of cover and vantage for predators. Similarly, the lands along the R172 required for Site drainage and discharge are continuous with the extensive coastal and estuarine habitats within Dundalk Bay but are immediately adjacent to the public road and of no realistic utility to wintering waterfowl for foraging or high-tide roosts and none were observed this close to the road during Site inspections conducted during the winter (February, October and December 2018, January and February 2019). The interface between the R172 and Dundalk Bay was inspected at maximum spring high tide in January 2019 although waterfowl were observed closer to the road on this occasion than on other inspections none were observed roosting or foraging at or within 100 m of the Site boundaries.

#### 4.3.6. Geographical Valuation of Ecological Receptors

The ecological resources within, or ecologically/hydrologically connected to, the Site as identified through the Site surveys and desktop research, are assigned value and importance in a geographical context (as per Table 4.1), as follows:

**Table 4.6 - Geographical Evaluation of Ecological Receptors/Resources**

Receptor	Value	Rationale
Dundalk Bay SAC	International	All internationally designated Sites (SAC, SPA, Ramsar) or candidate/proposed Sites are automatically evaluated as being of international value.
Dundalk Bay SPA	International	
Dundalk Bay Ramsar Site	International	
Dundalk Bay pNHA	National	All nationally designated Sites (e.g. NHA, pNHA) are automatically evaluated as being of national value.
Common pipistrelle <i>Pipistrellus</i>	Regional	All bats are listed on Annex IV of the Habitats Directive as European Protected Species (EPS) and are of international nature conservation value. Commuting and foraging (non-roosting) populations use the Site boundaries in low numbers. As resident or regularly occurring populations of national importance are not present, local populations are considered to be of regional (county) importance.
Soprano pipistrelle <i>Pipistrellus pygmaeus</i>	Regional	
Leisler's bat <i>Nyctalus leisleri</i>	Regional	
Myotis (undifferentiated) <i>Myotis spp.</i>	Regional	
Badger <i>Meles meles</i>	Regional	

Receptor	Value	Rationale
Hedgehog <i>Erinaceus europaeus</i>	Regional	Hedgehogs are protected under National legislation.  A small resident population is confirmed from the Site.
Breeding Bird Assemblage	Local (higher value)	All wild birds and their nests (while active) receive protection under national legislation.  As the Site provides only very limited nesting opportunities and is likely to support a typical, low-density breeding/nesting assemblage, local Importance (higher value) is appropriate.
Wintering Bird Assemblage	Regional	All wild birds receive protection under national legislation. The Site provides very limited habitat opportunities for SPA species and is likely to support only a limited assemblage of non-target species during the winter. As the Site has limited suitability for wintering bird assemblages outside the SPA, and as SPA species may occur at most occasionally and in non-significant numbers, regional (county) importance is appropriate.
Hedgerows (native species) & Mixed Woodland	Local (higher value)	Boundary and internal hedgerows (those dominated by native species), scrub and the small area of mixed woodland to the north-east of the Site are of local (higher value) nature conservation value. Lands required for the implementation of Site drainage and discharge have adjoining hedgerows.
Marshy/Swampy Grassland & Scrub	Local (higher value)	The small, degraded wetland (wet grassland and scrub) area to the east of the Site is of local (higher value) nature conservation value. This includes lands on the interface between the R172 required to implement Site drainage and discharge.
Common frog <i>Rana temporaria</i>	Local	No resident/breeding population confirmed but sub-optimal habitat opportunities are available, and frogs may be present within the Site.
Irish hare <i>Lepus timidus hibernicus</i>	Local	No resident population confirmed but there are local records for hares from within 2 km of the Site.



## 4.4. Ecological Impact Assessment

### 4.4.1. EclA – Likely Significant Ecological Effects (Construction and Operational Phases)

#### 4.4.1.1. Sites Designated for Nature Conservation

The NIS, the final stage in the iterative, pre-application design and shadow assessment process, sets out in considerable detail (in Appendix B.3) that the development proposals can be implemented without causing significant adverse effects on the integrity of Dundalk Bay SAC or Dundalk Bay SPA to arise. For the purposes of assessment, it is assumed that the SAC and SPA designations encompass the Ramsar and pNHA feature interest.

Employing the *source-pathway-receptor* model, significant adverse impacts on designated Sites may arise as a result of pollution and degradation of SAC/SPA habitats and *ex-situ* impacts on SPA feature and assemblage species:

- Pollution of the SAC/SPA – earthworks and construction activities will mobilise silts and sediments which present a risk of contamination to the SAC and SPA through surface water drainage.
- Pollution of the SAC/SPA – construction activities will generate waste streams which present a risk of contamination (fuels and other hydrocarbons, cements and other construction materials etc.) to the SAC and SPA through surface water drainage.
- Pollution of the SAC/SPA – occupation of the Site will generate surface and stormwater runoff which is to be discharged to Dundalk Bay via SUDS drainage infrastructure – this presents a risk of contamination (silts, hydrocarbons etc.) to the SAC and SPA.
- Pollution of the SAC/SPA – occupation of the Site will generate foul sewage for disposal.
- Degradation of Natural Habitats within the SAC – occupation of the Site will generate surface and stormwater runoff which is to be disposed of to Dundalk Bay via SUDS infrastructure – this presents a risk of degradation of natural habitats within the SAC and SPA through erosion etc.
- Ex-Situ Impacts on SPA Feature & Assemblage Species – noise and vibration from piling, rock-breaking, blasting and other intensive construction activities can result in significant disturbances to avifauna, even over a distance of several hundred metres. It is highly unlikely that piling will be required during the construction of the Site. The existing ground conditions where the new units will be constructed are favourable, with rock prevalent in the area. The construction of the initial section of the new main access from the R172 will require some consideration due to the poor ground conditions but it is likely that a solution providing a stiff sub-grade and pavement foundation layers rather than piling will be adopted. Rock breaking or blasting may be required to install services, the wastewater pumping station and excavate underground car parks into the bedrock.
- Ex-Situ Impacts on SPA Feature & Assemblage Species – discrete elements of Site development which must take place close to the shore, such as the creation of the main Site access on the R172 Blackrock Road and the installation of drainage and discharge infrastructure, may result in localised disturbances.

Should any such impacts arise these would likely be significant in terms of Site integrity.

#### 4.4.1.2. Habitats & Flora

The Site is proposed for comprehensive housing development, with associated access, car parking, landscaping and other Site and infrastructure works. The scheme will be developed in phases, as illustrated by the phasing plan. The scale of residential and infrastructure development inevitably requires substantial losses and alterations to existing habitats and landscaping.

The small section of marshy/swampy grassland and scrub to the east of the Site is the only area of notable semi-natural habitat which will be lost to development.

No losses of wetland habitat will occur due to the implementation of drainage and discharge infrastructure. Lands required comprise sections of the public road and adjoining hedges and marginal grassland which may be adversely affected.

#### 4.4.1.3. Bats

Bat activity was largely restricted to the Site boundaries, with commuting and foraging individuals of four species observed and recorded. Local roosting was indicated from Site surveys within structures outside the Site boundaries. It is unlikely that Site development will adversely impact local populations as no actual or potential roost Sites and no useful commuting or foraging habitat will be degraded or lost. Development is largely restricted to the open, central areas of the Site, leaving hedgerows and scrub on the Site boundaries and the small area of mixed woodland in the north-eastern corner of the Site intact. The strong linear habitat features on the Site boundaries used by commuting/foraging bats will persist post-development. Construction and development may result in some minor losses of foraging and disturbance to potential roost Sites during the construction phase.

The small section of marshy/swampy grassland and scrub to the east of the Site is the only area of notable semi-natural habitat which will be lost to development and may represent a minor loss in foraging resources. No losses of potentially important foraging or commuting habitat will occur due to the implementation of drainage and discharge infrastructure.

Increased artificial illumination, which will be introduced by the construction and operation of the new housing development, can degrade the utility of natural and semi-natural habitats for commuting, foraging and roosting bats. This may compromise patterns of movement and foraging, particularly for *Myotis spp.*, and may compromise flyways to and from roosts on lands outside but close to the Site. The degree of impact varies according to species, but all bats respond negatively to the illumination of roost exits.

#### 4.4.1.4. Badgers

A local social group is active in the area and seems to make limited use of the Site for commuting and foraging, and more so in the winter; there are no setts within the Site or adjoining lands. Badger movement within the Site is largely restricted to the Site boundaries and in particular, the eastern boundary where the Site adjoins small stands of mixed woodland and mature gardens etc. The western boundary will retain the open, semi-natural golf course post-development, the southern boundary will retain open farmland post-development, and the eastern boundary will retain scrub, rough grassland, woodland and mature gardens with some additional planting and access to the central landscaped area within the Site. The establishment of the main Site access road may disrupt badgers on an established commuting route along the eastern Site boundary.

As no setts will be destroyed and as the Site does not represent a major foraging area it is unlikely that the development of the Site will have any significant adverse impacts on the local population. Construction works present some risk of injury and disruption/disturbance.

#### 4.4.1.5. Hedgehogs

A resident population has been confirmed, associated with the scrub and hedgerows along the Site boundaries, particularly to the east, rather than the open central areas of the Site. Development of the Site may displace the local population and construction works present risk of injury and disruption/disturbance.

#### 4.4.1.6. Hares

No resident/regular population was confirmed but there are local records for hares from within 2 km of the Site and this species may occasionally be present. Development of the Site may displace the local population and construction works present risk of injury and disruption/disturbance.

#### 4.4.1.7. Herpetofauna

No resident/breeding populations confirmed but sub-optimal habitat opportunities are available for frogs, which may be present within the Site. The small section of marshy/swampy grassland and scrub to the east of the Site, which provides marginal habitat, will be lost to development.

#### 4.4.1.8. Avifauna – Breeding/Nesting Assemblage

The open, central areas of the Site are to be developed, with mature trees, hedgerows and scrub on the boundaries largely retained. The small section of marshy/swampy grassland and scrub to the east of the Site, which provides some nesting habitat, will be lost to development. This and other incidental losses of scrub during Site clearance will represent a minor/insignificant loss of nesting habitat.

#### 4.4.1.9. Avifauna – Wintering Assemblage

Construction operations within the main section of the Site are unlikely to result in significantly increased anthropogenic disturbance to wintering birds (both SPA and non-SPA species) within the Site and habitat loss as a result of Site development is unlikely to be a significant issue to the wintering assemblage.

Noise and vibration from rock-breaking, blasting and other construction activities can result in significant disturbances to avifauna, even over a distance of several hundred metres. Rock breaking or blasting may be required to install services, the wastewater pumping station and excavate underground car parks into the bedrock. Discrete elements of Site development which must take place close to the shore, such as the creation of the main Site access on the R172 Blackrock Road and the installation of drainage and discharge infrastructure, may result in localised disturbances.

#### 4.4.2. Summary of Ecological Impacts

Table 4.7 below outlines a summary of potential ecological impacts on the VERs found within and around the Site. Impacts are assessed in terms of whether they are positive or negative along with estimating duration, timing and magnitude of said impacts. Potential ecological effects or impacts are assessed as worst case scenario prior to consideration of mitigation measures. Assessments are formulated using professional experience and judgement and consider the likely significance of the impacts on the ecological receptors.

Table 4.7 - EclA – Assessment of Potential Ecological Impacts

VER	Impacting Activity (details)	Positive Negative	Direct Indirect	Duration Reversibility	Timing Frequency	Magnitude Extent	Likely Significance
Dundalk Bay SAC (Dundalk Bay pNHA)	<u>Pollution of the SAC</u> Earthworks and construction activities will mobilise silts and sediments which present risks of contamination to the SAC through surface water drainage.	Negative	Indirect	Temporary	Short/Medium Construction	Low	Probable Major
	<u>Pollution of the SAC</u> Construction activities will generate waste streams which present risks of contamination (fuels and other hydrocarbons, cements and other construction materials etc.) to the SAC through surface water drainage.	Negative	Indirect	Temporary	Medium Construction	Medium	Unlikely Major
	<u>Pollution of the SAC</u> Occupation of the Site will generate surface and stormwater runoff which is to be disposed of to Dundalk Bay via drainage infrastructure – this presents risks of contamination (silts, hydrocarbons etc.) to the SAC.	Negative	Indirect	Reversible	Long Occupation	High	Probable Major
	<u>Pollution of the SAC</u> Occupation of the Site will generate	Negative	Indirect	Reversible	Long Occupation	High	Unlikely Major

VER	Impacting Activity (details)	Positive Negative	Direct Indirect	Duration Reversibility	Timing Frequency	Magnitude Extent	Likely Significance
	foul sewage for disposal.						
	<u>Degradation of Natural Habitats within the SAC.</u> Occupation of the Site will generate surface and stormwater runoff which is to be disposed of to Dundalk Bay via drainage infrastructure – this presents a risk of degradation to natural habitats within the SAC through erosion etc.	Negative	Indirect	Reversible	Long Occupation	Low	Probable Major
<b>Dundalk Bay SPA Dundalk Bay Ramsar (Dundalk Bay pNHA)</b>	<u>Pollution of the SPA/Ramsar</u> Earthworks and construction activities will mobilise silts and sediments which present risks of contamination to the SPA/Ramsar through surface water drainage.	Negative	Indirect	Temporary	Short/Medium Construction	Low	Probable Major
	<u>Pollution of the SPA/Ramsar</u> Construction activities will generate waste streams which present risks of contamination (fuels and other hydrocarbons, cements and other construction materials etc.) to the SPA/Ramsar through surface water	Negative	Indirect	Temporary	Medium Construction	Medium	Unlikely Major



VER	Impacting Activity (details)	Positive Negative	Direct Indirect	Duration Reversibility	Timing Frequency	Magnitude Extent	Likely Significance
	drainage.						
	<p><u>Pollution of the SPA/Ramsar</u></p> <p>Occupation of the Site will generate surface and stormwater runoff which is to be disposed of to Dundalk Bay via drainage infrastructure – this presents risks of contamination (silts, hydrocarbons etc.) to the SPA/Ramsar.</p>	Negative	Indirect	Reversible	Long Occupation	High	Probable Major
	<p><u>Pollution of the SPA/Ramsar</u></p> <p>Occupation of the Site will generate foul sewage for disposal.</p>	Negative	Indirect	Reversible	Long Occupation	High	Unlikely Major
	<p><u>Degradation of Natural Habitats within the SPA/Ramsar</u></p> <p>Occupation of the Site will generate surface and stormwater runoff which is to be disposed of to Dundalk Bay via drainage infrastructure – this presents a risk of degradation to natural habitats within the SPA/Ramsar</p>	Negative	Indirect	Reversible	Long Occupation	Low	Probable Major

VER	Impacting Activity (details)	Positive Negative	Direct Indirect	Duration Reversibility	Timing Frequency	Magnitude Extent	Likely Significance
	through erosion etc.						
	<p><u>Ex-Situ Impacts on SPA/Ramsar Feature &amp; Assemblage Species</u></p> <p>Noise and vibration from piling and other intensive construction activities can result in significant disturbances to avifauna, even over a distance of several hundred metres.</p>	Negative	Indirect	Temporary	Short Construction	Low	Probable Moderate
	<p><u>Ex-Situ Impacts on SPA/Ramsar Feature &amp; Assemblage Species</u></p> <p>Discrete elements of Site development which must take place close to the shore, such as the creation of the main Site access on the R172 Blackrock Road and the installation of the drainage outfall, may result in localised disturbances.</p>	Negative	Indirect	Temporary	Short Construction	Low	Probable Moderate

VER	Impacting Activity (details)	Positive Negative	Direct Indirect	Duration Reversibility	Timing Frequency	Magnitude Extent	Likely Significance
<b>Common pipistrelle</b> <i>Pipistrellus</i> <b>Soprano pipistrelle</b> <i>Pipistrellus pygmaeus</i> <b>Leisler's bat</b> <i>Nyctalus leisleri</i> <b>Myotis (undiff.)</b> <i>Myotis spp.</i>	<u>Artificial illumination</u> Illumination can degrade the utility of habitats for commuting, foraging and roosting bats and may compromise patterns of movement and foraging, particularly for <i>Myotis</i> spp. The degree of impact varies according to species, but all bats respond negatively to the illumination of roost exits.	Negative	Direct	Reversible	Long Occupation	Low	Probable Moderate
	<u>Disturbance, Loss of Foraging</u> Construction and development may result in some minor losses of foraging and disturbance to potential roost Sites during the construction phase.	Negative	Direct	Temporary	Short Construction	Low	Probable Minor
<b>Badger</b> <i>Meles meles</i>	<u>Disturbance, Loss of Foraging</u> Minimal use of the Site by badgers for commuting and foraging. Development of the Site will result in some loss of foraging and disruption to commuting routes within the territory during the construction and occupation phases.	Negative	Direct	Permanent	Long Occupation	Low	Probable Minor

VER	Impacting Activity (details)	Positive Negative	Direct Indirect	Duration Reversibility	Timing Frequency	Magnitude Extent	Likely Significance
	However, the main Site access may disrupt commuting badgers						
	<u>Injury, Disturbance</u> Construction presents risks of injury and increased disturbance within the territory during the construction phase.	Negative	Direct	Temporary	Short/Medium Construction Occupation	Low	Probable Minor
<b>Hedgehog</b> <i>Erinaceus europaeus</i>	<u>Injury, Disturbance</u> Resident population associated with the scrub and hedgerows along the Site boundaries. Habitat is to be retained and enhanced but construction presents risks of injury and development of the Site will result in an increased disturbance during the construction and occupation phases.	Negative	Direct	Permanent	Long Construction Occupation	Medium	Probable Moderate
<b>Common frog</b> <i>Rana temporaria</i>	<u>Loss of Habitat</u> The small section of marshy/swampy grassland and scrub to the east of the Site, which provides marginal habitat, will be lost to development.	Negative	Direct	Permanent	Long Construction Occupation	Medium	Probable Moderate
<b>Irish hare</b> <i>Lepus timidus</i>	<u>Loss of Habitat</u> No resident/regular population	Negative	Direct	Permanent	Long Construction	Medium	Unlikely Moderate

VER	Impacting Activity (details)	Positive Negative	Direct Indirect	Duration Reversibility	Timing Frequency	Magnitude Extent	Likely Significance
<i>hibernicus</i>	confirmed. The development will result in the loss of open areas within the Site.				Occupation		
<b>Breeding Bird Assemblage</b>	<u>Destruction of Nests</u> Destruction or damage to active nests during the construction phase.	Negative	Direct	Permanent	Short/Medium Construction	Medium	Probable Moderate
	<u>Loss of Habitat</u> Loss of nesting and foraging habitat to Site development.	Negative	Indirect	Reversible	Short/Medium Construction Occupation	Medium	Probable Moderate
<b>Wintering Bird Assemblage</b>	<u>Disturbance.</u> Noise and vibration from rock-breaking, blasting and other construction activities can result in significant disturbances to avifauna, even over a distance of several hundred metres. Rock breaking or blasting may be required to install services, the wastewater pumping station and excavate underground car parks into the bedrock.	Negative	Indirect	Temporary	Short Construction	Low	Probable Moderate
	<u>Disturbance.</u> Discrete elements of Site development	Negative	Indirect	Temporary	Short Construction	Low	Probable Moderate



VER	Impacting Activity (details)	Positive Negative	Direct Indirect	Duration Reversibility	Timing Frequency	Magnitude Extent	Likely Significance
	which must take place close to the shore, such as the creation of the main Site access on the R172 Blackrock Road and the installation of drainage and discharge infrastructure, may result in localised disturbances.						
<b>Hedgerows (native species) &amp; Mixed Woodland</b>	<u>Loss</u> Incidental losses during Site clearance and construction. Lands required for the Site drainage and discharge are adjoined by hedgerows which may be adversely affected.	Negative	Direct	Permanent	Long Construction	Medium	Certain Minor
<b>Marshy/Swampy Grassland &amp; Scrub</b>	<u>Loss</u> The small section of marshy/swampy grassland and scrub to the east of the Site will be lost to development.	Negative	Direct	Permanent	Long Construction	Medium	Certain Minor

## 4.5. Mitigation of Ecological Effects

Table 4.8 below provides the schedule of mitigation measures, as per the approach detailed in Table 4.4 above, and is arranged according to VER, for each identified impact or effect.

### 4.5.1. Mitigation for Sites Designated for Nature Conservation

As is set out and assessed in the NIS (Appendix B.3) three broad approaches are adopted to the mitigation of impacts on the designated Sites of Dundalk Bay:

- Pollution Control in the Construction phase
- Pollution Control in the Operational Phase
- Prevention of Disturbance to SPA Species in the Construction Phase.

These broad approaches to mitigation are implemented through:

- Construction Environmental Management Plan (CEMP)
- Construction Programme
- Sustainable Drainage (SuDS) System
- Silt Traps & Hydrocarbon Interceptors
- Foul Disposal
- Site-Specific Environmental Management Plan (EMP)

#### 4.5.1.1. Construction and Environmental Management Plan (CEMP)

A project specific Detailed Construction Environmental Management Plan (CEMP), based on the schedule of commitments presented in the EIAR (and NIS), will be prepared for the construction phase. An Outline CEMP<sup>10</sup> has been prepared for submission with the planning application.

The CEMP collates and sets out the environmental control measures required to minimise, and control adverse environmental impacts associated with the development. It is intended that the CEMP will be a live document, which will capture all construction-phase environmental mitigation measures included within the EIAR and any other measures which become apparent through the EIA consultation process and/or are prescribed through planning conditions etc. The CEMP will include enabling decommissioning works. The outline document provides a framework for the contractor to develop further as the project moves into the construction phase.

The specific measures required for the protection of Dundalk Bay SPA & SAC, as set out in the NIS and Chapter 4 of this EIAR, are as follows:

- All construction and operations are to be carefully planned and implemented with a series of environmental management and control procedures. The CEMP details the general pollution prevention principles and measures which are to be implemented, water and sediment management measures to prevent pollution during the construction phase and measures to ensure the potential for pollution fuel, oil, chemicals and other construction materials is minimised.
- The Contractor shall engage a suitably experienced ecologist, the Project Ecologist, who will be a full member of a relevant professional institute such as the Chartered Institute of Ecology and Environmental Management (CIEEM), have relevant experience in the management of ecological constraints during construction, and hold or have held a protected species licence(s). The Project Ecologist shall be appointed sufficiently in advance of construction to arrange for any mitigation requirements to be incorporated into the CEMP and any Site-specific method statements.
- In advance of commencement of the construction phase, the disused existing onsite well, securely located within a pump house in the north-western portion of the Site will be fully decommissioned by an experienced borehole specialist in accordance with relevant guidelines, 'Good practice for decommissioning redundant boreholes and wells' (UK Environment Agency, 2012). This will ensure that the redundant well is made both safe and structurally stable and will be suitably backfilled or sealed to prevent groundwater pollution and flow of water between different aquifer units.

<sup>10</sup> 'Strategic Housing Development, Blackrock, Dundalk, Co. Louth. Outline Construction Environmental Plan. Kingsbridge Consultancy Ltd.' (Atkins, December 2018)

- The construction management of the Site will take account of the recommendations of the Construction Industry Research and Information Association (CIRIA) guides 'Control of Water Pollution from Construction Sites' and 'Groundwater control - design and practice' to minimise as far as possible the risk of pollution.
- All of the mitigation measures (for the protection of soils and geology) listed in Chapter 9 will be implemented onsite during the construction phase.
- The Contractor shall take all necessary precautions to prevent pollution or silting from construction activities. The following management, control and mitigation measures will be implemented:
  - Any groundwater temporarily dewatered during the construction of the infiltration basin, wastewater pumping station and any deep building foundations in localised areas in the eastern portion of the Site will be treated via the installation of a temporary in-situ water treatment system;
  - This system should be designed and sized to ensure that all pumped groundwater is treated prior to discharge to a selected onsite location (via a temporary soakaway).
  - The Contractor will be required to provide a Site-specific dewatering plan, clearly setting out proposed excavation methodology, estimated dewatering rates, details of the proposed treatment system, and discharge location.
  - Surface water attenuation measures are to be designed which will not be overwhelmed by one-off adverse precipitation events.
  - Where practical, cut-off V drains will be utilised to divert water entering the Site and reduce the amount of water to be managed on-Site. Attention will be given to the maintenance and protection of all drains and temporary channels to minimise scour and the mobilisation of suspended solids (e.g. lining with hessian or clean stone, check dams, silt fencing etc.).
  - Mud will be controlled at entry and exits to the Site using wheel washes and/or road sweepers, and tools and plant will be washed out and cleaned in designated areas. Wheel washings will be contained and treated prior to discharge.
  - Runoff will be directed to and intercepted by temporary settlement lagoons. The size of the settlement lagoon will be determined from predicted flow rates and retention times based on sediment particle size and density.
  - Neither groundwater nor surface water runoff from the working areas will be permitted to discharge directly to the environment. Runoff generated within the Site during construction will be filtered and treated to remove hydrocarbons and sediment. Total Suspended Solids (TSS), pH/EC and colour will be monitored daily and outlets from sedimentation ponds will incorporate a turbidity monitor with alarm at a high level.
  - Subject to consent, water that is unpolluted, aside from its silt content, may be pumped out over adjacent vegetated ground, where appropriate, with consideration given to groundwater level and saturation, wildlife importance and proximity to drainage channels.
  - In the event of surface water failing to meet the required standards water will be recirculated to the inlet of the sediment pond to provide further time for settlement. A penstock valve will be provided on the outlet from the sediment pond to control discharge from the Site.
  - The performance of the surface water drainage network will be maintained and monitored throughout the construction of the proposed development, noting that the proposed storm water system will include permanent hydrocarbon separators.
  - Where the Contractor utilises pumping to drain works areas, a back-up pump and generator must be provided on Site for use in the event of the primary pump failing.
  - Procedures are to be put in place to ensure the identification, remediation and correct reporting of any silt or other pollution incidents that may occur.
  - During localised construction works around the northern and eastern drainage channels (to facilitate the installation of the proposed 2no. outfalls/headwalls), any minor volumes of stripped soils should be stockpiled a minimum distance of 10m from each channel and should be appropriately covered. A temporary stormwater management system should be implemented by the Contractor.
  - Areas should be designated where stockpiles will be established in order to facilitate the efficient transfers of material within the Site. Stockpiles will be stabilised as soon as possible (e.g. sealed, closed over, seeded or covered using geotextile mats), and bunded by earth or silt fences at the toe to intercept silt-laden runoff during rainfall events.

- Appropriate working practices to avoid the repetitive handling of excavated substrates, minimise vehicle movements, limit the size, number and frequency of stockpiles, reduce the compaction and erosion of soils etc. and control the generation of dust. The implementation of a construction traffic management plan and controls on the locations of plant and materials will minimise the compaction and erosion of soil. Excavation is to be restricted during high winds and heavy rainfall to minimise dust generation and contaminated surface runoff.
- Excavated materials are to be inspected for signs of possible contamination, such as staining or strong odours. Should any be noticed, substrates are to be segregated and samples analysed for contaminants to determine an appropriate means of disposal to licensed/permitted facilities appropriate for the waste classification.
- In order to prevent any potential surface water/groundwater impacts via. release of hydrocarbon/chemical contaminants the following standard measures will be implemented:
  - The Contractor will ensure all Site personnel are trained in the handling of materials, the sensitive nature of the receiving environment, the drainage system and the consequences of accidental spillages.
  - Fuels, lubricants and hydraulic fluids for equipment used on the construction Site, as well as any solvents, oils, and paints, will be carefully handled to avoid spillage, properly secured against unauthorised access or vandalism, and provided with spill containment according to best codes of practice;
  - Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the proposed development for disposal or recycling;
  - Any spillage of fuels, lubricants or hydraulic oils will be immediately contained, and the contaminated soil removed from the proposed development and properly disposed of;
  - All Site vehicles used will be refuelled in bunded and adequately sealed and covered areas in the construction compound area;
  - Strict supervision of contractors will be adhered to in order to ensure that all plant and equipment utilised on-Site is in good working condition. Any equipment not meeting the required standard will not be permitted for use within the Site. This will minimise the risk of groundwater becoming contaminated through Site activity;
  - All oil stored on Site for construction vehicles will be kept in a locked and bunded area;
  - Generators, pumps and similar plant will be placed on drip-trays to prevent contamination;
  - All Site vehicles used will be refuelled in bunded areas;
  - All temporary construction fuel tanks will also be located in a suitably bunded area and all tanks will be double skinned. Relevant Material Safety Data Sheets along with oil absorbent materials will be kept on Site in close proximity to any fuel storage tanks or bowsers during proposed Site development works;
  - All fuel/oil deliveries to on-Site oil storage tanks will be supervised, and records will be kept of delivery dates and volumes;
  - Fixed plant shall be self-bunded; mobile plant shall be in good working order, kept clean, fitted with drip trays where appropriate and subject to regular inspection. Drip trays will be covered, emptied regularly as required and disposed of off-Site having regard for relevant waste management legislation;
  - Spill kits and oil absorbent material shall be carried with mobile plant and located at vulnerable locations around the Site to reduce the risk of spillages entering the sub-surface or groundwater environment; booms shall be held on-Site for works near drains or dewatering points; and,
  - Procedures are to be put in place to ensure the identification, remediation and correct reporting of any fuel, oil, chemical or other pollution incidents that may occur.
- In order to prevent any potential surface water/groundwater impacts via. release of cementitious materials the following measures will be implemented:
  - No mixing of concrete will be carried out on Site. The measures detailed below will be employed where poured concrete is being used in the construction process;
  - The production, transport and placement of all cementitious materials will be strictly planned and supervised. Site batching/production of concrete will not be carried out on Site and therefore these aspects will not pose a risk to the waterbodies present, namely any temporarily exposed groundwater, or local drainage channels, wetlands or Dundalk Bay;

- Shuttters will be designed to prevent failure. Grout loss will be prevented from shuttered pours by ensuring that all joints between panels achieve a close fit or that they are sealed;
  - Any spillages will be cleaned up and disposed of correctly;
  - Where concrete is to be placed by means of a skip, the opening gate of the delivery chute will be securely fastened to prevent accidental opening;
  - Where possible, concrete skips, pumps and machine buckets will be prevented from slewing over water when placing concrete; and,
  - Surplus concrete will be returned to batch plant after completion of a pour.
  - The Contractor will dispose of all alkaline wastewaters and contaminated stormwater off-Site having regard for waste management legislation.
- The Contractor will implement procurement procedures to ensure that aggregate, fill material and topsoil are acquired from reputable sources with suitable environmental management systems as well as regulatory and legal compliance.
  - The Contractor will vet the source of aggregate, fill material and topsoil imported to the Site in order to ensure that it is of a reputable origin and that it is “clean” (i.e. it will not contaminate the environment).
  - All material to be disposed of off-Site to a facility licensed having regard for relevant waste management legislation. Where material is to be stockpiled on Site prior to disposal, the Contractor will control all run-off to prevent contamination of surrounding watercourses.
  - The project specific Detailed CEMP will include an Emergency Response Plan (ERP) based on the Contractor’s Risk Assessment, to be reviewed and approved by the Project Ecologist. The ERP will include (but not limited to):
    - training of relevant staff, including cover staff, in the implementation of the ERP and the use of spill kits;
    - procedures to be undertaken in the event of the release of any sediment into a watercourse, or any spillage of chemicals, fuel, oil or other hazardous materials or wastes;
    - procedures to be undertaken in the event of any non-compliance incidents with any permit or licence, or other such risks that could lead to a pollution incident, including flood risks;
    - the number, specification and location of all spill kits which shall be carried/kept on the Site;
    - information on clean-up and reporting procedures; etc.

While it is expected that the Site drainage system will be installed and commissioned early in the Site construction programme, and will, therefore, be operational for much of the construction phase, there will be a period of the construction phase during which the Site drainage system will not be operational. The project specific Detailed Construction Environmental Management Plan (CEMP) is required to cover this period and to deal with other issues during the construction phase.

#### 4.5.1.2. Construction Programme

The project specific Detailed CEMP will include a section setting out the construction programme and will include all the environmental control measures required to avoid disturbance to SPA species, as set out below. The project specific Detailed CEMP will also set out general measures to manage noise and vibration from construction activities that may be employed at the Site.

All rock breaking, blasting and other high-intensity construction activities as may be required within the Site are to be programmed to take place outside the wintering season for SPA feature species (i.e. to take place between May and September) to ensure that disturbance to wintering species is avoided.

All discrete elements of Site construction close to the shore of Dundalk Bay (establishment of the main Site access and installation of infrastructure for Site drainage and discharge) are to be programmed to take place outside the wintering season for SPA feature species (i.e. to take place between May and September) to ensure that disturbance to wintering species is avoided.



#### 4.5.1.3. Sustainable Urban Drainage Systems (SUDS)

The storm/surface drainage system for the operation phase has been designed based on Sustainable Drainage Systems (SuDS) principles and incorporated into the development proposals. The specific aspects of the drainage design required for the protection of Dundalk Bay SPA and SAC, as set out in the NIS and Chapter 4 of this EIAR, are as follows.

The SuDS scheme has been designed, through iterative project design and assessment, with the habitat features and conservation objectives of the SPA and SAC in mind. Storm and surface water arising from the Site will ultimately discharge to the SPA/SAC; the SuDS system has been designed to collect and attenuate storm/surface water arising from the Site and conduct the allowable greenfield runoff to the discharge points alongside the R172, on the edge of Dundalk Bay and to the degraded wetland alongside the main Site entrance. No outfalls are proposed within the designated area and maximum discharges are limited to pre-development greenfield runoff rates, further reduced, retarded and diffused through additional measures designed into the system.

The system includes four separate networks, an infiltration basin, a box culvert at the outlet and several other features designed to reduce the velocity of the discharge flow in the receiving channel and therefore prevent any erosion or degradation of semi-natural habitat areas within Dundalk Bay. The design of the discharge, into an existing open channel from a box culvert, is such that there will be no structures or development on the foreshore and no direct discharge to any area within the SAC/SPA boundaries.

Two of the four networks serve that part of the development Site where the new residential units will be constructed, Networks 1 & 2, which serve 96% of the new development, collect surface water to the stormwater infiltration basin, from where it can be retained prior to discharge (or diverted in an emergency, as detailed further below). Network 3 is the gravity pipeline which conveys the allowable greenfield runoff to the discharge channel along the R172. Network 4 is a separate drainage network that serves the main Site access roadway; the topography of this area of the Site is such that the runoff will discharge to the degraded wetland alongside the main Site entrance. The north-eastern section of the Site, which contains 20no. units includes a stormwater infiltration basin. Site investigations have confirmed capacity in the sub-soil for surface water runoff infiltration in this area – this will have the effect of reducing the volume of surface water runoff from the developed Site. Network 3 also conducts runoff from this area to the box culvert outfall.

The overall capacity of the Infiltration basin/pond is 3,690m<sup>3</sup>. The required storage for a 1 in 100yr storm event is 2,978m<sup>3</sup> where we have made provision for a situation that if the discharge from the onsite storage becomes partially blocked (allowed for 50% blockage) that there is sufficient storage to take the runoff. The volume of surface water runoff held within the infiltration basin will vary in response to preceding precipitation; the provision of a penstock valve on the outlet allows discharge flow to the box culvert and receiving channel to be controlled and limited.

The section of the box culvert (1.0 m wide x 0.75 m high), which conducts the discharge flow to the existing receiving channel, will be laid at a flat gradient and will be partially submerged, to provide a depth of water within the base. This will ensure that the velocity of water flow from the outlet will be less than 0.5 ms<sup>-1</sup>. Discharge velocity will be further reduced by stone riprap at the outlet, which will also diffuse the flow into the receiving channel.

The ultimate transfer of storm/surface water arising from the Site will occur via infiltration, at a rate of flow less than 0.5 ms<sup>-1</sup>, to semi-natural habitats within Dundalk Bay, on the shore side of the R172, but well outside the SAC and SPA boundaries. There will, therefore, be no outfall or any appreciable flow of water directly to natural habitats within Dundalk Bay SPA/SAC, and no potential for any habitat loss or fragmentation through degradation or erosion.

#### 4.5.1.4. Silt Traps & Hydrocarbon Interceptors

As is set out in the NIS and Chapter 4 of this EIAR, the SuDS design includes silt removal traps and Class 1 hydrocarbon separators within each of the four networks. This is the primary mechanism for preventing contaminated surface water runoff entering Dundalk Bay during the operation phase. For Networks 1 & 2, the silt traps and hydrocarbon separators are to be installed prior to discharge to the stormwater infiltration basin. For Network 3, a separate silt trap and interceptor is provided to treat runoff from the north-eastern section of the Site. Similarly, for Network 4, a separate silt trap and hydrocarbon separator will be installed on the line before discharge to the wetland area.

The traps and separators have been designed specifically to the capacity/flow for each network with a minimum retention time of 6 minutes to allow immiscible hydrocarbon pollutants to accumulate on the surface and suspended solids to sink to the bottom of the unit.

The most likely sources of contamination of the surface and storm runoff are general grit and silt arising from gardens and hard surfaces, hydrocarbons from vehicle exhausts and fuels or oil spills and leaks, vehicle tyre wear, burning plastics, wastewater from washing cars, pesticides etc. used for gardening and materials used in home maintenance. While the risks to the designated Sites from these forms of contamination are significant, the likely volumes are expected to be low and to remain within the design capacity of the traps and interceptors, maintained and cleaned in line with the manufacturer's recommendations.

All storm/surface water will, therefore, be treated prior to discharge. As the Network 1 & 2 traps and separators are to be installed in line before the infiltration basin, 96% of surface/stormwater arising from the development will also be subject to the contingency arrangements detailed below for failure and overloading. These arrangements will ensure that any contamination within surface water that may arise on the Site will be removed and prevented from discharging to Dundalk Bay SPA/SAC. All surface and storm waters discharging to ground or more directly to Dundalk Bay will be clean and clear.

For the operation phase, the SuDS drainage system includes several measures for maintenance and management and contingency for emergencies and failure.

- The overall capacity of the stormwater infiltration basin is c. 3,690m<sup>3</sup> where the required storage for a maximum 1 in 100-year storm event is c. 2,978m<sup>3</sup>, leaving 712m<sup>3</sup> spare capacity.
- The Drainage Assessment sets out a detailed schedule for inspection and maintenance/cleaning of the silt traps and hydrocarbon separators through the construction phase, the initial operation phase and thereafter, with the longer-term schedule to be defined following the first 6 months of Site experience.
- All silt traps and hydrocarbon separators will be located in areas where they will be easily accessible for maintenance and cleaning. All will be fitted with an alarm system that will activate when the level of hydrocarbon pollutants reaches a pre-determined level where maintenance and cleaning will then be required.

While the risk of contamination from expected/design volumes of contamination will be removed by the traps and interceptors functioning normally and maintained and cleaned in line with the manufacturer's recommendations, larger scale incidents such as a property fire will generate larger volumes of contaminated water which will enter the drainage system. As the traps and separators are unlikely, in such cases, to remove all the contaminants it is proposed that a pipeline is installed, connecting the infiltration basin to the nearby foul sewerage pumping station, and fitted with a penstock valve. This would allow larger volumes of contaminated surface water runoff to be held in the infiltration basin (which is designed with considerable additional capacity) while a decision to be made on how to satisfactorily deal with the incident and the option to divert to the public foul sewerage network for treatment in the municipal plant before discharge. A second penstock valve would also be fitted on the outlet pipeline (Network 3) to close the discharge to Dundalk Bay while contaminated flows are diverted. These procedures will ensure that in emergency situations larger volumes of contaminated water can be prevented from discharging to Dundalk Bay SAP/SAC.

#### 4.5.1.5. Foul Water Disposal

As is set out in the NIS and Chapter 4 of this EIAR, mains infrastructure for foul sewage disposal has been designed in accordance with Irish Water Code of Practice. All wastewater streams will be collected within a gravity network and will be transferred to public mains via. an on-Site foul sewerage pumping station with rising main from where it will connect to the public gravity mains at a stand-off manhole located at the N52 junction with the Crowne Plaza Hotel/ DKIT entrance, and to the municipal Dundalk Wastewater Treatment Plant (WWTP). The proposed onsite wastewater pumping station which will be a closed system, located along the eastern boundary of the Site, with capacity for minimum 12-hour emergency storage. Irish Water has confirmed that the existing foul network has sufficient capacity to meet the combined wastewater discharge volumes expected from the proposed development, once operational.

#### 4.5.1.6. Site Specific Environmental Management Plan (EMP)

The following mitigation measures, which should form part of a Site-specific Environmental Management Plan (EMP) during the operational phase, are proposed:

- All plant and equipment utilised onsite during maintenance works should be checked and in good working condition. Any equipment not meeting the required standard will not be permitted for use within the Site;
- Any minor volumes of fuel, oil or chemicals required during routine maintenance works will be brought to and from the Site by the maintenance contractor. While temporarily onsite all chemicals will be kept in secure and bunded areas, with relevant Material Safety Data Sheets available onsite. Any fuel/oil tanks temporarily stored on Site will be located in a suitably bunded area and all tanks will be double skinned, with oil/chemical absorbent materials held onsite in close proximity to the tanks;
- In the unlikely event of a fuel/oil or chemical spill/leak during routine maintenance works, emergency spill response measures will be implemented with the aim of limiting the volume spilled and recovering as much of the lost product as possible;
- A detailed Site Management Plan should be put in place for the operational phase of the development. This plan should clearly outline standard operating procedures for each of the following:
  - Maintenance of newly installed stormwater drainage system including all newly installed gullies, silt trap and Class 1 petrol/oil separators, infiltration basin, emergency penstock valves, and outfalls. Routine inspections of all silt trap and Class 1 petrol/oil separators will minimise the potential risk of equipment failure;
  - Maintenance of newly installed foul drainage system including the newly commissioned wastewater pumping station, rising main, pump (and back-up pump), and emergency storage tank;
  - Emergency response in the unlikely event of a major fuel/oil spill onsite;
  - Emergency response in the unlikely event of a major fire at any of the newly constructed properties;
  - Action response in the unlikely event of a deterioration in stormwater quality discharging from the Site; and,
  - Waste management.
- The management plan should include all health and safety and environmental management procedures associated with the above tasks and should also identify when routine equipment maintenance and checks will be carried out (as per the relevant manufacturer's requirements and industry standards).
- A nominated person (Site maintenance manager) should be responsible for ensuring that all required equipment maintenance, checks and repairs are carried out as and when required and will keep an up to date maintenance record for the Site. Contact details of an alternative Site maintenance contact should be included within the management plan.
- The roles, responsibilities, and contact details for all Site maintenance operators and emergency services should be contained within the management plan, along with reporting and notification procedures for management, regulators and stakeholders.
- The Site maintenance manager will be responsible for ensuring that, in the unlikely event of either a SuDs failure (e.g. overloading of silt trap and Class 1 petrol/oil separator) or a major onsite contamination incident (e.g. fire water run-off following major property fire) all emergency penstock valves will be immediately closed, resulting in all stormwater from the Site being either diverted, or held within the onsite infiltration basin, as per the engineering design.
- All contaminated water should be disposed of to a suitably licenced offsite waste facility, in accordance with all relevant waste management legislation. This will ensure that there is no risk of any contaminated stormwater impacting Dundalk Bay SAC/ SPA. Procedures and checks would have to be put in place to ensure that the valves are returned to their normal states once the contaminated volume of stormwater is removed from the basin and storm drainage network.

#### 4.5.1.7. Habitats & Flora

##### ***Phasing, Landscaping Replanting & Maturation (Trees & Hedgerows)***

Significant levels of boundary and internal landscape planting are proposed which will enhance retained vegetation and offset the minor and incidental losses required to implement the proposed development. Proposed new landscaping and planting will enhance and strengthen hedgerow boundaries and increase the woodland/scrub resource within the Site. The loss of the small wetland area to the construction of the main Site access will be further compensated by the creation of new attenuation pond/wetland area. The scheme will be developed in phases, as illustrated by the phasing plan. Overall losses will be experienced gradually, allowing time for new planting to establish and develop.

#### 4.5.1.8. Bats

##### ***Phasing, Landscaping Replanting & Maturation (Trees & Hedgerows)***

The scheme will be developed in phases, as illustrated by the phasing plan. Overall losses will be experienced gradually, allowing time for commuting and foraging to be re-established along Site boundaries and within the range of the species affected.

The detailed landscaping scheme shows significant levels of new internal landscape and boundary planting which will enhance and strengthen hedgerow boundaries and increase the woodland/scrub resource within the Site. The creation of a new wetland/attenuation pond area within zoned open space in the eastern section of the Site may enhance the overall habitat utility of the Site for bats.

##### ***Lighting Design***

At present, most of the Site retains high levels of nocturnal darkness, with just sporadic illumination around the boundaries from dwellings on adjoining lands. It will be necessary to design Site lighting, both temporary lighting required for the construction phase and the permanent public amenity scheme, to ensure minimal spillage onto the Site boundaries.

As is set out in Chapter 12, detailed lighting will be designed in accordance with relevant best practice standards and current technology, to satisfy all statutory and planning requirements. The Bat Conservation Trust (BCT) provides detailed guidance<sup>11</sup> on lighting design which will be applied.

#### 4.5.1.9. Terrestrial Mammals – Badgers

##### ***Phased Development***

The scheme will be developed in phases, as illustrated by the phasing plan. Overall habitat losses will be experienced gradually, allowing time for commuting routes and foraging to be established elsewhere within the territory of the local social group.

##### ***Badger Underpass***

A badger underpass will help maintain the local commuting route along the eastern Site boundary, particularly during the winter when badger activity is more frequent in this area and animals are active earlier in the evening. The specific design of the underpass, and associated fencing/planting etc. will be in accordance with relevant best practice standards. The approximate position of badger trails along the eastern Site boundary is indicated below and the trial location is considered to be the prime location for a mammal underpass. The location of the proposed underpass is to be micro-Sited in advance of the commencement of the construction phase within the constraints of road alignment and open space in the immediate vicinity and exact location should be determined through consultation with a suitably qualified ecologist.

##### ***Construction phase Management & Protection***

Noting that the scheme will be developed in phases, the Site will be resurveyed for badger activity and the presence of setts by the project ecologist during the autumn/winter prior to the commencement of each phase of development, with walkover verification and check surveys completed in the 4 weeks prior to commencement of each new phase and periodically during construction works. Any new setts that may be established within the Site can be managed through the wildlife licensing process.

<sup>11</sup> Available from: <https://www.bats.org.uk/our-work/buildings-planning-and-development/lighting>



The following standard management and protection measures will be implemented during the construction works and monitored by the project ecologist.

- Prior to works commencing, all personnel are to be briefed about the presence of badgers in the area and the management and protection measures to be implemented.
- The Site, ongoing development/construction operations and any badger management/protection measures are to be checked periodically by the project ecologist to ensure best practice and compliance. Badger activity within and around the Site will be monitored by the project ecologist to ensure that no significant perturbations or disturbances to the local social group with remedial mitigation designed and implemented as necessary.
- No excavations are to be left uncovered overnight or without a means of egress (e.g. a ramp or sloped plank) to prevent badgers from falling in or entering in search of food and becoming trapped.
- No buildings or storage units are to be left open overnight to prevent badgers from entering in search of food and becoming trapped.
- All food waste is to be properly secured and disposed of to avoid attracting badgers to the Site.
- No toxic, poisonous or potentially harmful substances or materials are to be left unsecured overnight.
- Should any new badger setts or mammal burrows be discovered within the Site or immediately adjoining areas the project ecologist is to be contacted for immediate inspection, advice and liaison with NPWS as necessary.
- Should any sick, injured or dead badgers be encountered or discovered, or should any badgers be sighted within the Site during daylight, the project ecologist is to be contacted for immediate inspection, advice and liaison with NPWS.





#### 4.5.1.10. Terrestrial Mammal – Hedgehogs

##### ***Phased Development***

The scheme will be developed in phases, as illustrated by the phasing plan. Overall habitat losses will be experienced gradually, allowing time for the local population to habituate to the reconfigured habitat resource.

##### ***Hibernacula/Refugia***

It is recommended that habitat niches suitable for hedgehog refuge and hibernation, for example, piles of logs and cut branches, are created at suitable locations within planted areas around the Site boundaries where these adjoin undeveloped lands. The specific design and situation to be determined, and installation undertaken, by the project ecologist within the constraints and opportunities presented by the phased construction of the scheme.

##### ***Construction phase Management & Protection***

Noting that the scheme will be developed in phases, the Site will be resurveyed for hedgehogs by the project ecologist during the late summer or autumn prior to the commencement of each phase of development, with walkover verification and check surveys completed in the 4 weeks prior to commencement and periodically during construction works. Specific attention is to be paid to potential hibernation Sites during the winter months. Any hedgehogs discovered can be removed to a safe location or into care by a qualified and experienced mammal handler and through the wildlife licensing process.

The following standard management and protection measures will be implemented during the construction works and monitored by the project ecologist.

- Prior to works commencing, all personnel are to be briefed about the presence of hedgehogs in the area and the management and protection measures to be implemented.
- The Site, ongoing development/construction operations and any hedgehog management/protection measures are to be checked periodically by the project ecologist to ensure best practice and compliance.
- Site operations should avoid leaving piles of cut branches or vegetation, which might attract hedgehogs for refuge, in areas away from the Site boundaries. Any such piles which must be moved are to be checked for hedgehogs by the project ecologist.
- No excavations are to be left uncovered overnight or without a means of egress (e.g. a ramp or sloped plank) to prevent hedgehogs from falling in or entering in search of food and becoming trapped.
- No buildings or storage units are to be left open overnight to prevent hedgehogs from entering in search of food and becoming trapped.
- All food waste is to be properly secured and disposed of.
- No toxic, poisonous or potentially harmful substances or materials are to be left unsecured overnight.
- Should any sick, injured or dead hedgehogs be encountered or discovered, or should any hedgehogs be sighted within the Site during daylight, the project ecologist is to be contacted for immediate inspection, advice and liaison with NPWS.

#### 4.5.1.11. Terrestrial Mammal – Hares

##### ***Phased Development***

The scheme will be developed in phases, as illustrated by the phasing plan. Overall habitat losses will be experienced gradually, allowing time for the local population to habituate to the reconfigured habitat resource.

##### ***Construction phase Management & Protection***

Noting that the scheme will be developed in phases, the Site will be resurveyed for hares by the project ecologist prior to the commencement of each phase of development, with walkover verification and check surveys completed periodically during construction works.

Should any sick, injured or dead hares be encountered or discovered, or should any hares be sighted within the Site during daylight, the project ecologist is to be contacted for immediate inspection, advice and liaison with NPWS.

Any leverets encountered should not be handled or moved and must be left undisturbed until retrieved by the mother. The project ecologist is to be contacted for immediate inspection, advice and monitoring (and liaison with NPWS if required).

#### 4.5.1.12. Herpetofauna – Frogs

##### **Landscaping (Ponds)**

The loss of the small wetland area to the construction of the main Site access will be compensated by the creation of a new attenuation pond/wetland area.

##### **Construction phase Management & Protection**

The wetland area will be surveyed for breeding frogs and spawn by the project ecologist during the late winter and early spring prior to the commencement of Site access works. Any breeding population of frogs/spawn can be removed to a safe location and/or managed through the wildlife licensing process.

#### 4.5.1.13. Avifauna – Breeding/Nesting Assemblage

##### **Phasing, Landscaping Replanting & Maturation (Trees & Hedgerows)**

The scheme will be developed in phases, as illustrated by the phasing plan. Overall losses will be experienced gradually, allowing time for nesting and foraging to be re-established along Site boundaries and within the Site as development progresses.

The detailed landscaping scheme shows significant levels of new internal landscape and boundary planting which will enhance and strengthen hedgerow boundaries and increase the woodland/scrub resource within the Site.

##### **Construction Programme**

All incidental vegetation clearance/removal will be implemented in the winter months, outside the bird breeding season, to ensure that no active nests are destroyed, damaged or disturbed. Where this is not possible, works will be undertaken under the supervision of the project ecologist, once it has been established that vegetation is free from active nests.

#### 4.5.1.14. Avifauna – Wintering Assemblage

##### **Construction Programme**

All rock breaking, blasting and other high-intensity construction activities as may be required within the Site are to be programmed to take place outside the wintering season for SPA feature species (i.e. to take place between May and September) to ensure that disturbance to wintering species is avoided.

All discrete elements of Site construction close to the shore of Dundalk Bay (establishment of the main Site access and installation of infrastructure for Site drainage and discharge) are to be programmed to take place outside the wintering season for SPA feature species (i.e. to take place between May and September) to ensure that disturbance to wintering species is avoided.

The Construction Programme will be set out in the project specific Detailed Construction Environmental Management Plan (CEMP) and will include these constraints. The project specific Detailed CEMP will also set out general measures to manage noise and vibration from construction activities that may be employed at the Site.

The project ecologist will monitor wintering bird numbers and behaviour within and around the Site and along that section of the foreshore of Dundalk Bay close to the Site on a monthly basis during each wintering season while construction is on-going. Additional monitoring will be undertaken prior to and during any activity which may disturb local populations of any SPA feature species.

## 4.5.2. Summary of Mitigation Measures

A summary of mitigation measures for each Valued Ecological Receptor is outlined in Table 4.8. below.

Table 4.8 – Summary of Mitigation Measures

VER	Likely Significant Impact	Mitigation Proposed	Type	Confidence Implementation	Confidence Success
Dundalk Bay SAC (Dundalk Bay pNHA)	<p><b>Major Negative</b></p> <p><u>Pollution of the SAC</u></p> <p>Earthworks and construction activities will mobilise silts and sediments which present risks of contamination to the SAC through surface water drainage.</p>	<p>Construction Environmental Management Plan (CEMP)</p> <p>Sustainable Drainage Systems (SuDS)</p> <p>Silt Traps &amp; Hydrocarbon Interceptors</p>	<p>Elimination</p> <p>Reduction</p>	Certain	Certain
	<p><b>Major Negative</b></p> <p><u>Pollution of the SAC</u></p> <p>Construction activities will generate waste streams which present risks of contamination (fuels and other hydrocarbons, cements and other construction materials etc.) to the SAC through surface water drainage.</p>	<p>Construction Environmental Management Plan (CEMP)</p> <p>Sustainable Drainage Systems (SuDS)</p> <p>Silt Traps &amp; Hydrocarbon Interceptors</p>	<p>Elimination</p> <p>Reduction</p>	Certain	Certain
	<p><b>Major Negative</b></p> <p><u>Pollution of the SAC</u></p> <p>Occupation of the Site will generate</p>	<p>Sustainable Urban Systems (SuDS)</p> <p>Silt Traps &amp; Hydrocarbon Interceptors</p> <p>Site-Specific Environmental</p>	<p>Elimination</p> <p>Reduction</p>	Certain	Certain

VER	Likely Significant Impact	Mitigation Proposed	Type	Confidence Implementation	Confidence Success
	surface and stormwater runoff which is to be disposed of to Dundalk Bay via drainage infrastructure – this presents risks of contamination (silts, hydrocarbons etc.) to the SAC.	Management Plan (EMP)			
	<b>Major Negative</b> <u>Pollution of the SAC</u> Occupation of the Site will generate foul sewage for disposal.	Foul Disposal Site-Specific Environmental Management Plan (EMP)	Elimination	Certain	Certain
	<b>Major Negative</b> <u>Degradation of Natural Habitats within the SAC.</u> Occupation of the Site will generate surface and stormwater runoff which is to be disposed of to Dundalk Bay via drainage infrastructure – this presents a risk of degradation to natural habitats within the SAC through erosion etc.	Sustainable Drainage Systems (SuDS) Silt Traps & Hydrocarbon Interceptors Site-Specific Environmental Management Plan (EMP)	Elimination Reduction	Certain	Certain
<b>Dundalk Bay SPA</b> <b>Dundalk Bay Ramsar</b>	<b>Major Negative</b> <u>Pollution of the SPA/Ramsar</u>	Construction Environmental Management Plan (CEMP)	Elimination Reduction	Certain	Certain

VER	Likely Significant Impact	Mitigation Proposed	Type	Confidence Implementation	Confidence Success
(Dundalk Bay pNHA)	Earthworks and construction activities will mobilise silts and sediments which present risks of contamination to the SPA/Ramsar through surface water drainage.	Sustainable Drainage Systems (SuDS) Silt Traps & Hydrocarbon Interceptors			
	<p><b>Major Negative</b></p> <p><u>Pollution of the SPA/Ramsar</u></p> <p>Construction activities will generate waste streams which present risks of contamination (fuels and other hydrocarbons, cements and other construction materials etc.) to the SPA/Ramsar through surface water drainage.</p>	<p>Construction Environmental Management Plan (CEMP)</p> <p>Sustainable Drainage Systems (SuDS)</p> <p>Silt Traps &amp; Hydrocarbon Interceptors</p>	<p>Elimination</p> <p>Reduction</p>	Certain	Certain
	<p><b>Major Negative</b></p> <p><u>Pollution of the SPA/Ramsar</u></p> <p>Occupation of the Site will generate surface and stormwater runoff which is to be disposed of to Dundalk Bay via drainage infrastructure – this presents risks of contamination (silts, hydrocarbons etc.) to the</p>	<p>Sustainable Drainage Systems (SuDS)</p> <p>Silt Traps &amp; Hydrocarbon Interceptors</p> <p>Site-Specific Environmental Management Plan (EMP)</p>	<p>Elimination</p> <p>Reduction</p>	Certain	Certain

VER	Likely Significant Impact	Mitigation Proposed	Type	Confidence Implementation	Confidence Success
	SPA/Ramsar.				
	<p><b>Major Negative</b></p> <p><u>Pollution of the SPA/Ramsar</u></p> <p>Occupation of the Site will generate foul sewage for disposal.</p>	<p>Foul Disposal</p> <p>Site-Specific Environmental Management Plan (EMP)</p>	Elimination	Certain	Certain
	<p><b>Major Negative</b></p> <p><u>Degradation of Natural Habitats within the SPA/Ramsar</u></p> <p>Occupation of the Site will generate surface and stormwater runoff which is to be disposed of to Dundalk Bay via drainage infrastructure – this presents a risk of degradation to natural habitats within the SPA/Ramsar through erosion etc.</p>	<p>Sustainable Drainage Systems (SuDS)</p> <p>Silt Traps &amp; Hydrocarbon Interceptors</p> <p>Site-Specific Environmental Management Plan (EMP)</p>	<p>Elimination</p> <p>Reduction</p>	Certain	Certain
	<p><b>Moderate Negative</b></p> <p><u>Ex-Situ Impacts on SPA/Ramsar Feature &amp; Assemblage Species</u></p> <p>Noise and vibration from piling and other intensive construction activities can result in significant disturbances to avifauna, even over</p>	<p>Construction Environmental Management Plan (CEMP)</p> <p>Construction Programme</p>	Reduction	Certain	Probable



VER	Likely Significant Impact	Mitigation Proposed	Type	Confidence Implementation	Confidence Success
	a distance of several hundred metres.				
	<p><b>Moderate Negative</b></p> <p><u>Ex-Situ Impacts on SPA/Ramsar Feature &amp; Assemblage Species</u></p> <p>Discrete elements of Site development which must take place close to the shore, such as the creation of the main Site access on the R172 Blackrock Road and the installation of the drainage outfall, may result in localised disturbances.</p>	<p>Construction Environmental Management Plan (CEMP)</p> <p>Construction Programme</p>	Reduction	Certain	Probable
<p><b>Bats</b></p> <p><i>P. pipistrellus</i></p> <p><i>P. pygmaeus</i></p> <p><i>N. leisleri</i></p> <p><i>Myotis spp.</i></p>	<p><b>Moderate Negative</b></p> <p><u>Artificial illumination</u></p> <p>Illumination can degrade the utility of habitats for commuting, foraging and roosting bats and may compromise patterns of movement and foraging, particularly for <i>Myotis</i> spp. The degree of impact varies according to species, but all bats respond negatively to the illumination of roost exits.</p>	Lighting Design	Reduction	Certain	Probable

VER	Likely Significant Impact	Mitigation Proposed	Type	Confidence Implementation	Confidence Success
	<p><b>Minor Negative</b></p> <p><u>Disturbance, Loss of Foraging</u></p> <p>Construction and development may result in some minor losses of foraging and disturbance to potential roost Sites during the construction phase.</p>	Phasing, Landscaping Replanting & Maturation (Trees & Hedgerows)	Compensation	Certain	Probable
<p><b>Badger</b></p> <p><i>Meles meles</i></p>	<p><b>Minor Negative</b></p> <p><u>Disturbance, Loss of Foraging</u></p> <p>Minimal use of the Site by badgers for commuting and foraging. Development of the Site will result in some loss of foraging and disruption to commuting routes within the territory during the construction and occupation phases. The main Site access may disrupt commuting badgers</p>	Phased Development Badger Underpass	Reduction Enhancement	Certain	Probable
	<p><b>Minor Negative</b></p> <p><u>Injury, Disturbance</u></p> <p>Construction presents risks of injury and increased disturbance within the territory during the construction</p>	Construction phase Management & Protection	Elimination Reduction	Certain	Probable

VER	Likely Significant Impact	Mitigation Proposed	Type	Confidence Implementation	Confidence Success
	phase.				
<b>Hedgehog</b> <i>Erinaceus europaeus</i>	<p><b>Moderate Negative</b> <u>Injury, Disturbance</u></p> <p>Resident population associated with the scrub and hedgerows along the Site boundaries. Habitat is to be retained and enhanced but construction presents risks of injury and development of the Site will result in an increased disturbance during the construction and occupation phases.</p>	<p>Phased Development</p> <p>Hibernaculae/Refugia</p> <p>Construction phase Management &amp; Protection</p>	<p>Reduction</p> <p>Enhancement</p>	Certain	Probable
<b>Common frog</b> <i>Rana temporaria</i>	<p><b>Moderate Negative</b> <u>Loss of Habitat</u></p> <p>The small section of marshy/swampy grassland and scrub to the east of the Site, which provides marginal habitat, will be lost to development.</p>	<p>Landscaping (Ponds)</p> <p>Construction phase Management &amp; Protection</p>	<p>Reduction</p> <p>Compensation</p>	Probable	Probable
<b>Irish hare</b> <i>Lepus timidus hibernicus</i>	<p><b>Moderate Negative</b> <u>Loss of Habitat</u></p> <p>No resident/regular population</p>	<p>Phased Development</p> <p>Construction phase Management &amp; Protection</p>	<p>Reduction</p>	Probable	Probable

VER	Likely Significant Impact	Mitigation Proposed	Type	Confidence Implementation	Confidence Success
	confirmed. The development will result in the loss of open areas within the Site.				
<b>Breeding Bird Assemblage</b>	<b>Moderate Negative</b> <u>Destruction of Nests</u> Destruction or damage to active nests during the construction phase.	Construction Programme	Elimination	Certain	Certain
	<b>Moderate Negative</b> <u>Loss of Habitat</u> Loss of nesting and foraging habitat to Site development.	Phasing, Landscaping Replanting & Maturation (Trees & Hedgerows)	Reduction Compensation	Certain	Certain
<b>Wintering Bird Assemblage</b>	<b>Moderate Negative</b> <u>Disturbance</u> Noise and vibration from rock-breaking, blasting and other construction activities can result in significant disturbances to avifauna, even over a distance of several hundred metres. Rock breaking or blasting may be required to install services, the	Construction Programme	Reduction	Certain	Probable

VER	Likely Significant Impact	Mitigation Proposed	Type	Confidence Implementation	Confidence Success
	wastewater pumping station and excavate underground car parks into the bedrock.				
<b>Hedgerows, Scrub &amp; Mixed Woodland</b>	<p><b>Minor Negative</b></p> <p><u>Loss</u></p> <p>Incidental losses during Site clearance and construction. Lands required for the Site drainage and discharge are adjoined by hedgerows which may be adversely affected.</p>	Phasing, Landscaping Replanting & Maturation (Trees & Hedgerows)	Compensation Enhancement	Certain	Probable
<b>Marshy/Swampy Grassland &amp; Scrub</b>	<p><b>Minor Negative</b></p> <p><u>Loss</u></p> <p>The small section of marshy/swampy grassland and scrub to the east of the Site will be lost to development.</p>	Phasing, Landscaping Replanting & Maturation (Trees & Hedgerows)	Compensation	Certain	Probable

## 4.6. Assessment of Residual Ecological Effects

The overall residual, or mitigated, ecological impacts of the proposed development (Table 4.8) are assessed by taking account of the identified likely significant adverse impacts (Table 4.6), expected beneficial ecological impacts and the schedule of ecological mitigation (Table 4.7).

Assessment shows that residual ecological impacts are reduced to insignificant and acceptable levels in the short or medium term through the implementation of management and mitigation.

Due to the low ecological value of the Site, proposed landscaping and internal/boundary planting are expected to result in minor beneficial effects to the local habitat resource.

No significant adverse impacts on local wildlife are expected.

The scheme of mitigation developed for the construction and operational phases is technically feasible and attach a high level of confidence in implementation and success. No significant adverse impacts are expected to occur on Dundalk Bay and the integrity of the associated designated Sites.

A summary of the assessment of residual impacts is outlined below in Table 4.9.



**Table 4.9 Assessment of Residual Ecological Effects.**

<b>VER</b>	<b>Summary of Impacts</b>	<b>Mitigation Proposed</b>	<b>Residual Impact</b>	<b>Significance</b>	<b>Confidence</b>
<b>Dundalk Bay SAC</b> <b>(Dundalk Bay pNHA)</b>	<p><b>Major Negative</b></p> <p><u>Pollution of the SAC</u></p> <p>Earthworks and construction activities will mobilise silts and sediments which present risks of contamination to the SAC through surface water drainage.</p>	<p>Construction Environmental Management Plan (CEMP).</p> <p>Sustainable Drainage Systems (SuDS).</p> <p>Silt Traps &amp; Hydrocarbon Interceptors</p>	de minimis	Insignificant impact due to proposed mitigation	Certain
	<p><b>Severe Negative</b></p> <p><u>Pollution of the SAC</u></p> <p>Construction activities will generate waste streams which present risks of contamination (fuels and other hydrocarbons, cements and other construction materials etc.) to the SAC through surface water drainage.</p>	<p>Construction Environmental Management Plan (CEMP)</p> <p>Sustainable Drainage Systems (SuDS)</p> <p>Silt Traps &amp; Hydrocarbon Interceptors</p>	de minimis	Insignificant impact due to proposed mitigation	Certain
	<p><b>Severe Negative</b></p> <p><u>Pollution of the SAC</u></p> <p>Occupation of the Site will generate surface and stormwater runoff which is to be disposed of to Dundalk Bay via drainage infrastructure – this presents risks of contamination (silts, hydrocarbons etc.) to the SAC.</p>	<p>Sustainable Drainage Systems (SuDS)</p> <p>Silt Traps &amp; Hydrocarbon Interceptors</p> <p>Site-Specific Environmental Management Plan (EMP)</p>	de minimis	Insignificant impact due to proposed mitigation	Certain

VER	Summary of Impacts	Mitigation Proposed	Residual Impact	Significance	Confidence
	<p><b>Severe Negative</b></p> <p><u>Pollution of the SAC</u></p> <p>Occupation of the Site will generate foul sewage for disposal.</p>	<p>Foul Disposal</p> <p>Site-Specific Environmental Management Plan (EMP)</p>	de minimis	Insignificant impact due to proposed mitigation	Certain
	<p><b>Major Negative</b></p> <p><u>Degradation of Natural Habitats within the SAC.</u></p> <p>Occupation of the Site will generate surface and stormwater runoff which is to be disposed of to Dundalk Bay via drainage infrastructure – this presents a risk of degradation to natural habitats within the SAC through erosion etc.</p>	<p>Sustainable Drainage Systems (SuDS)</p> <p>Silt Traps &amp; Hydrocarbon Interceptors</p> <p>Site-Specific Environmental Management Plan (EMP)</p>	de minimis	Insignificant impact due to proposed mitigation	Certain
<p><b>Dundalk Bay SPA</b></p> <p><b>Dundalk Bay Ramsar (Dundalk Bay pNHA)</b></p>	<p><b>Major Negative</b></p> <p><u>Pollution of the SPA/Ramsar</u></p> <p>Earthworks and construction activities will mobilise silts and sediments which present risks of contamination to the SPA/Ramsar through surface water drainage.</p>	<p>Construction Environmental Management Plan (CEMP)</p> <p>Sustainable Drainage Systems (SuDS)</p> <p>Silt Traps &amp; Hydrocarbon Interceptors</p>	de minimis	Insignificant impact due to proposed mitigation	Certain
	<p><b>Severe Negative</b></p> <p><u>Pollution of the SPA/Ramsar</u></p> <p>Construction activities will generate waste streams which present risks of contamination (fuels and other hydrocarbons, cements and other construction</p>	<p>Construction Environmental Management Plan (CEMP)</p> <p>Sustainable Drainage Systems (SuDS)</p> <p>Silt Traps &amp; Hydrocarbon Interceptors</p>	de minimis	Insignificant impact due to proposed mitigation	Certain

VER	Summary of Impacts	Mitigation Proposed	Residual Impact	Significance	Confidence
	materials etc.) to the SPA/Ramsar through surface water drainage.				
	<p><b>Severe Negative</b></p> <p><u>Pollution of the SPA/Ramsar</u></p> <p>Occupation of the Site will generate surface and stormwater runoff which is to be disposed of to Dundalk Bay via drainage infrastructure – this presents risks of contamination (silts, hydrocarbons etc.) to the SPA/Ramsar.</p>	<p>Sustainable Drainage Systems (SuDS)</p> <p>Silt Traps &amp; Hydrocarbon Interceptors</p> <p>Site-Specific Environmental Management Plan (EMP)</p>	de minimis	Insignificant impact due to proposed mitigation	Certain
	<p><b>Severe Negative</b></p> <p><u>Pollution of the SPA/Ramsar</u></p> <p>Occupation of the Site will generate foul sewage for disposal.</p>	<p>Foul Disposal</p> <p>Site-Specific Environmental Management Plan (EMP)</p>	de minimis	Insignificant impact due to proposed mitigation	Certain
	<p><b>Major Negative</b></p> <p><u>Degradation of Natural Habitats within the SPA/Ramsar</u></p> <p>Occupation of the Site will generate surface and stormwater runoff which is to be disposed of to Dundalk Bay via drainage infrastructure – this presents a risk of degradation to natural habitats within the SPA/Ramsar through erosion etc.</p>	<p>Sustainable Drainage Systems (SuDS)</p> <p>Silt Traps &amp; Hydrocarbon Interceptors</p> <p>Site-Specific Environmental Management Plan (EMP)</p>	de minimis	Insignificant impact due to proposed mitigation	Certain
	<p><b>Moderate Negative</b></p>	<p>Construction Environmental</p>	de	Insignificant	Probable

VER	Summary of Impacts	Mitigation Proposed	Residual Impact	Significance	Confidence
	<p><u>Ex-Situ Impacts on SPA/Ramsar Feature &amp; Assemblage Species</u></p> <p>Noise and vibration from piling and other intensive construction activities can result in significant disturbances to avifauna, even over a distance of several hundred metres.</p>	<p>Management Plan (CEMP)</p> <p>Construction Programme</p>	<p>minimis</p>	<p>impact due to proposed mitigation</p>	
	<p><b>Moderate Negative</b></p> <p><u>Ex-Situ Impacts on SPA/Ramsar Feature &amp; Assemblage Species</u></p> <p>Discrete elements of Site development which must take place close to the shore, such as the creation of the main Site access on the R172 Blackrock Road and the installation of the drainage outfall, may result in localised disturbances.</p>	<p>Construction Environmental Management Plan (CEMP)</p> <p>Construction Programme</p>	<p>de minimis</p>	<p>Neutral</p> <p>Insignificant impact due to proposed mitigation</p>	<p>Probable</p>
<p><b>Bats</b></p> <p><i>P. pipistrellus</i></p> <p><i>P. pygmaeus</i></p> <p><i>N. leisleri</i></p> <p><i>Myotis spp.</i></p>	<p><b>Moderate Negative</b></p> <p><u>Artificial illumination</u></p> <p>Illumination can degrade the utility of habitats for commuting, foraging and roosting bats and may compromise patterns of movement and foraging, particularly for <i>Myotis spp.</i> The degree of impact varies according to species, but all bats respond negatively to the illumination of roost exits.</p>	<p>Lighting Design</p>	<p>de minimis</p>	<p>Insignificant impact due to proposed mitigation</p>	<p>Probable</p>

VER	Summary of Impacts	Mitigation Proposed	Residual Impact	Significance	Confidence
	<p><b>Minor Negative</b>  <u>Disturbance, Loss of Foraging</u>            Construction and development may result in some minor losses of foraging and disturbance to potential roost Sites during the construction phase.</p>	Phasing, Landscaping Replanting & Maturation (Trees & Hedgerows)	de minimis	Insignificant impact due to proposed mitigation	Probable
<b>Badger</b> <i>Meles meles</i>	<p><b>Minor Negative</b>  <u>Disturbance, Loss of Foraging</u>            Minimal use of the Site by badgers for commuting and foraging. Development of the Site will result in some loss of foraging and disruption to commuting routes within the territory during the construction and occupation phases. The main Site access may disrupt commuting badgers</p>	Phased Development Badger Underpass	de minimis	Insignificant impact due to proposed mitigation	Probable
	<p><b>Minor Negative</b>  <u>Injury, Disturbance</u>            Construction presents risks of injury and increased disturbance within the territory during the construction phase.</p>	Construction phase Management & Protection	de minimis	Insignificant impact due to proposed mitigation	Probable
<b>Hedgehog</b> <i>Erinaceus europaeus</i>	<p><b>Moderate Negative</b>  <u>Injury, Disturbance</u>            Resident population associated with the scrub and hedgerows along the Site boundaries. Habitat is to be</p>	Phased Development Hibernaculae/Refugia Construction phase Management & Protection	de minimis	Insignificant impact due to proposed mitigation	Probable

VER	Summary of Impacts	Mitigation Proposed	Residual Impact	Significance	Confidence
	retained and enhanced but construction presents risks of injury and development of the Site will result in an increased disturbance during the construction and occupation phases.				
<b>Common frog</b> <i>Rana temporaria</i>	<b>Moderate Negative</b> <u>Loss of Habitat</u> The small section of marshy/swampy grassland and scrub to the east of the Site, which provides marginal habitat, will be lost to development.	Landscaping (Ponds) Construction phase Management & Protection	de minimis	Insignificant impact due to proposed mitigation	Probable
<b>Irish hare</b> <i>Lepus timidus hibernicus</i>	<b>Moderate Negative</b> <u>Loss of Habitat</u> No resident/regular population confirmed. The development will result in the loss of open areas within the Site.	Phased Development Construction phase Management & Protection	de minimis	Insignificant impact due to proposed mitigation	Probable
<b>Breeding Bird Assemblage</b>	<b>Moderate Negative</b> <u>Destruction of Nests</u> Destruction or damage to active nests during the construction phase.	Construction Programme	de minimis	Insignificant impact due to proposed mitigation	Probable
	<b>Moderate Negative</b> <u>Loss of Habitat</u> Loss of nesting and foraging habitat to Site	Phasing, Landscaping Replanting & Maturation (Trees & Hedgerows)	de minimis	Insignificant impact due to proposed mitigation	Probable



VER	Summary of Impacts	Mitigation Proposed	Residual Impact	Significance	Confidence
	development.				
<b>Wintering Bird Assemblage</b>	<p><b>Moderate Negative</b> <u>Disturbance</u></p> <p>Noise and vibration from rock-breaking, blasting and other construction activities can result in significant disturbances to avifauna, even over a distance of several hundred metres. Rock breaking or blasting may be required to install services, the wastewater pumping station and excavate underground car parks into the bedrock.</p>	Construction Programme	de minimis	Insignificant impact due to proposed mitigation	Probable
<b>Hedgerows, Scrub &amp; Mixed Woodland</b>	<p><b>Minor Negative</b> <u>Loss</u></p> <p>Incidental losses during Site clearance and construction. Lands required for the Site drainage and discharge are adjoined by hedgerows which may be adversely affected.</p>	Phasing, Landscaping Replanting & Maturation (Trees & Hedgerows)	Minor	Significant Positive impact	Probable
<b>Marshy/Swampy Grassland &amp; Scrub</b>	<p><b>Minor Negative</b> <u>Loss</u></p> <p>The small section of marshy/swampy grassland and scrub to the east of the Site will be lost to development.</p>	Phasing, Landscaping Replanting & Maturation (Trees & Hedgerows)	Minor	Significant Positive impact	Probable

## 4.7. Assessment of Residual Ecological Effects

Cumulative effects are either interactive effects between aspects of the project/development or the combination of impacts with those arising from other projects/developments which act on the same ecological receptors.

### 4.7.1. Cumulative Effects

#### **Project**

Aspects of ground conditions and hydrogeology could interact with Site drainage and surface water management proposals for the construction or operation phases to create a surface water environment whereby permitted discharges (volume, rate, quality) to the local environment were exceeded. These issues are addressed in the SuDS design and recommendations for the CEMP, as detailed above. Control and emergency response procedures are specified to ensure that the potential for such interactions is minimised and that sufficient contingency is in place. On the basis of the information provided with respect to sustainable drainage, foul disposal, silt interception, hydrocarbon interception and construction phase pollution prevention, it can be ascertained that cumulative pathways are not operational and that cumulative effects are not likely to arise as a result of aspects of the project operating interactively in this manner.

Individually *de minimis* effects on bats arising as a result of the redistribution of foraging/commuting habitat and the impact of public amenity lighting may, if not mitigated and managed correctly, sterilise sections of the Site boundaries, leading to an enhanced cumulative impact.

Individually *de minimis* effects on badgers arising as a result of loss foraging/commuting habitat and construction phase disturbance may sterilise habitat remaining within the undeveloped sections of the Site or on adjoining lands, leading to an enhanced cumulative impact if not mitigated and managed correctly.

As the potential for disturbance to SPA feature species is limited to discrete aspects of construction methodology, which can be controlled and programmed to avoid significant disturbance, it can be ascertained that cumulative pathways are not operational and that cumulative *ex-situ* effects on wintering birds are not likely to arise.

#### **Other Projects or Developments**

The cumulative assessment has included the approved and still implementable planning applications identified within the EIAR:

- Planning permission has been granted for 125 housing units 200m south of the Site to Shannon Homes under planning reference number 16/151. This development is currently under construction.
- There is a planning application submitted for 16 housing units for Michael White immediately north of Bothar Maol under planning reference number 18/157.
- There is currently planning permission to convert outbuildings into a domestic dwelling immediately east of the Site and outline planning permission granted for two domestic houses north of Bothar Maol under planning reference number 11/462 and 12/213.

Cumulative effects are only likely to occur during the construction phase via the water environment where one or more other active development projects might affect the same watercourses, drainage channels or receiving waters. As is set out in Chapter 10, based on the nature of the proposed developments identified above and taking account of the proposed phasing and nature of this residential development, no significant cumulative impacts on the water environment (i.e. surface water or groundwater) are anticipated during the construction or operational phases. No potential cumulative flood risks have been identified.

With the environmental management and mitigation measures incorporated into the proposals, the impacts of Site development are expected to result in insignificant (*de-minimis*) ecological and hydrological effects on Dundalk Bay.

In the context of the scale of existing and ongoing development in the peri-urban landscape, development proposals do not contribute significantly to any pathway of additive, cumulative or in-combination effect which can be considered to increase the magnitude of residual impact predicted on habitats or species associated with other ecologically/hydrologically connected areas beyond the immediate confines of the Site, particularly Dundalk Bay.

As is set out in the NIS (Appendix B.3) it is considered following assessment, that there is no additive effect for significant cumulative or in-combination impacts on Dundalk Bay or associated designated Sites as a result of the proposed development when considered in conjunction with other plans and projects and/or in the context of the background ecological and hydrological condition of Dundalk Bay and overall trends.

Urban lands surrounding the Site are of little utility to mobile wildlife and no significant transit of target species from these areas towards or through the Site was noted. Development of the Site is unlikely to contribute to any significant additive effect of habit loss, degradation or fragmentation or to any interruption of connectivity within the wider landscape. No significant areas of natural or semi-natural habitat will be isolated or fragmented by the development; the Site boundaries, where all wildlife activity was recorded in any case, will remain available to mobile wildlife, particularly bats, badgers and birds which have been recorded in these areas.

#### 4.7.2. Cumulative Impact Assessment Conclusions

It is concluded, following assessment, that significant cumulative impacts on ecological receptors within, surrounding and ecologically/hydrologically connected to the Site are unlikely to occur as a result of the proposed development.

Cumulative impacts on bats and badgers as a result of the development project remain possible but are considered unlikely given the mitigation and management measures to be employed.

### 4.8. EclA – Summary of Ecological Effects and Conclusions

EclA has demonstrated that through iterative project design and assessment, and the identification of appropriate ecological mitigation measures, the residual ecological impacts of the development proposals are expected to be insignificant and localised to the Site and immediate environs. Local populations of bats, badgers, hedgehogs and birds may suffer some disruption and habitat loss in the short term but, as the greater part of the Site is ecologically sterile, habitat losses to development are insignificant. Some minor beneficial effects are expected and some opportunities for minor enhancement measures are presented. Provided ecological mitigation and management are implemented correctly no cumulative impacts are expected.

### 4.9. Monitoring Requirements

Pre-construction and in-construction surveying and monitoring requirements for wildlife are set out in the mitigation section above and are incorporated into the Outline CEMP submitted as part of this planning application.

Monitoring requirements to confirm the effectiveness of construction phase environmental management and pollution control measures are set out in the mitigation section above and are incorporated into the Outline CEMP submitted as part of this planning application.

Monitoring requirements to confirm the effectiveness of operational phase environmental management and pollution control measures are set out in Chapter 10 of the EIAR.