

Vattenfall Wind Power Ltd
Thanet Extension Offshore Wind Farm

Environmental Statement Volume 3
Chapter 5: Onshore Biodiversity

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Vattenfall Wind Power Ltd
Thanet Extension Offshore Wind Farm
Volume 3
Chapter 5: Onshore Biodiversity
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5 ONSHORE BIODIVERSITY

5.1 Introduction

5.1.1 This chapter sets out the results of the assessment of potentially significant effects of the proposed development on onshore biodiversity. This includes any effects of the proposed development within the onshore Red Line Boundary (RLB) and the surrounding area where appropriate. In addition, this chapter includes an assessment of effects on birds using intertidal habitats. Consideration of all other ecological receptors within intertidal areas is provided in Volume 2, Chapter 5: Benthic Subtidal and Intertidal Ecology (Document Ref: 6.2.5). Consideration of birds in subtidal areas is provided in Volume 2, Chapter 4: Offshore Ornithology (Document Ref: 6.2.4).

5.1.2 This chapter is supported by a number of technical annexes, included in Volume 5 of the Environmental Statement (ES), as listed below:

- Annex 5-1 Extended Phase 1 habitat survey report (Document Ref: 6.5.5.1);
- Annex 5-2 Water vole and otter survey report (Document Ref: 6.5.5.2);
- Annex 5-3 Great crested newt survey report (Document Ref: 6.5.5.3);
- Annex 5-4 Ornithology baseline report (Document Ref: 6.5.5.4);
- Annex 5-5 National vegetation classification (NVC) survey report (Document Ref: 6.5.5.5);
- Annex 5-6 Terrestrial invertebrate assessment report (Document Ref: 6.5.5.6);
- Annex 5-7 Reptile survey report (Document Ref: 6.5.5.7);
- Annex 5-8 Badger survey report (Document Ref: 6.5.5.8);
- Annex 5-9 Bat survey report (Document Ref: 6.5.5.9);
- Annex 5-10 Additional Phase 1 habitat survey report (Document Ref: 6.5.5.10);
- Annex 5-11 Additional great crested newt survey report (Document Ref: 6.5.5.11);
- Annex 5-12 Additional bat survey report (Document Ref: 6.5.5.12);
- Annex 5-13 Intertidal waterfowl data analysis in relation to onshore works (Document Ref: 6.5.5.13);
- Annex 5-14 Passage of ringed plover in Sandwich Bay (Document Ref: 6.5.5.14); and
- Annex 5-15 Scientific names of species mentioned in the text (Document Ref: 6.5.5.15).

5.1.3 Two of the technical annexes, Annex 5-1 (Document Ref: 6.5.5.1) and Annex 5-4 (Document Ref 6.5.5.4), include confidential appendices containing potentially sensitive data (i.e. badger sett locations and nesting locations for Schedule 1 bird species). This could lead to persecution if sensitive data were to enter the public domain. The confidential appendices should only be provided to relevant nature conservation organisations or at the explicit request of the Planning Inspectorate (PINS) or the Secretary of State (SoS).

5.1.4 This chapter should be read in conjunction with the scheme description provided in Volume 3, Chapter 1: Project Description (Onshore) and Volume 1, Chapter 3: Approach to Environmental Impact Assessment (EIA) (Document Refs: 6.3.1 and 6.1.3 respectively).

5.2 Statutory and Policy Context

5.2.1 In preparing this biodiversity assessment account has been taken of relevant legislation and policy, as outlined in Table 5.1. Further details regarding legislation and policy are provided in Volume 1 Chapter 2: Policy and Legislation (Document Ref: 6.1.2) and in the Planning Statement (Document Ref: 8.2).

Table 5.1: Legislation and policy context

Policy/legislation	Key provisions	Section where provision addressed
The Conservation of Habitats and Species Regulations 2017 (hereafter referred to as the Habitats Regulations)	<p>The Conservation of Habitats and Species Regulations 2017 consolidate and update the Conservation of Habitats and Species Regulations 2010. The Regulations transpose Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (EC Habitats Directive) into national law.</p> <p>The Regulations provide for the designation and protection of a network of 'European sites' (the Natura 2000 network), including Special Areas of Conservation (SACs), for habitats and species, and Special Protection Areas (SPAs), for birds. Under the Regulations a competent authority, before deciding to give consent for a plan or project which is likely to have a significant effect on a European site (either alone or in combination with other plans or projects) and is not directly connected with or necessary to the management of that site, must make an appropriate assessment of the implications of the plan or project for that site in view of that site's conservation objectives. A person applying for any such consent,</p>	<p>The relevant provisions of the Habitats Regulations are addressed in section 5.4, section 5.7, section 5.9 and sections 5.1-5.13.</p> <p>The relevant provisions of the Habitats Regulations are also addressed in the separate Report to Inform an Appropriate Assessment (RIAA) (Document Ref: 5.2).</p>

Policy/legislation	Key provisions	Section where provision addressed
	<p>must provide such information as the competent authority may reasonably require for the purposes of the assessment or to enable it to determine whether an appropriate assessment is required.</p> <p>The Regulations also provide for the protection of 'European protected species'. Under the Regulations it is an offence (subject to exceptions) to damage or destroy a breeding site or resting place or to deliberately capture, kill, injure disturb, take the eggs or trade any animal species listed in Schedule 2. It is also an offence to pick, collect, cut, uproot, destroy, or trade in any plant species listed in Schedule 5. However, these actions can be made lawful through the granting of licenses by the appropriate authorities.</p> <p>Licences may be granted for a number of purposes, including preserving public health or public safety or other imperative reasons of overriding public interest, including those of a social or economic nature. A licence can only be issued however after the appropriate authority is satisfied that there are no satisfactory alternatives and that such actions will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range.</p>	
Wildlife and Countryside Act 1981 (as amended)	<p>The Wildlife and Countryside Act 1981 (as amended) makes it an offence (subject to exceptions) to intentionally kill, injure or take any wild animal listed on Schedule 5 and prohibits intentional or reckless interference with places used for shelter or protection, or intentionally or recklessly disturbing animals occupying such places. The Act also prohibits certain methods of killing, injuring, or taking wild animals.</p> <p>The Act also makes it an offence (with exceptions) to intentionally: kill, injure, or take any wild bird; take, damage or destroy the nest of any wild bird while that nest is in use or being built; or take or destroy an egg of any wild bird.</p> <p>Bird species listed on Schedule 1 are also protected against intentional or reckless disturbance while</p>	The relevant provisions of the Wildlife & Countryside Act are addressed in section 5.4, section 5.7, section 5.9 and sections 5.1-5.13.

Policy/legislation	Key provisions	Section where provision addressed
	<p>building a nest; in, on or near a nest containing eggs or young; or with dependent young.</p> <p>The Act contains measures for preventing the establishment of non-native species which may be detrimental to native wildlife, prohibiting the release of animals and planting or otherwise causing to grow plants listed in Schedule 9.</p> <p>Sections 28 to 33 of Part 2 of the Wildlife and Countryside Act detail the law regarding Sites of Special Scientific Interest (SSSIs).</p> <p>Licences may be granted for a number of purposes under the Act, including licences covering the intentional disturbance of water voles and damage/destruction of water vole burrows by means of 'displacement'.</p>	
Natural Environment and Rural Communities Act 2006 (NERC Act 2006)	Section 41 of the Act lists species and habitats of principal importance for the purpose of conserving biodiversity in England.	This is addressed in section 5.4 and section 5.7.
The Protection of Badgers Act 1992	The legislation prohibits the wilful taking, injuring, selling, possessing or killing of badgers and it is an offence to damage, destroy or obstruct access to a badger sett or to disturb a badger whilst occupying a sett. A person shall not be guilty of an offence if they have a licence issued by the appropriate authority (in this case Natural England).	This is addressed in section 5.4 and section 5.7.
National Policy Statement (NPS) EN-1	<p>The NPS notes in Section 4.3.1 that prior to an order to grant development consent, due consideration must be given by the Infrastructure Planning Commission (IPC) (now the Planning Inspectorate (PINS)) as to whether the project may have a significant effect on a European site, or on any site to which the same protection is applied as a matter of policy, either alone or in combination with other plans or projects.</p> <p>NPS EN-1 Section 5.3 discusses the generic biodiversity</p>	<p>NPS section 4.3.1 is addressed in sections 5.4, 5.7, 5.9 and 5.10 to 5.13 and in the RIAA (Document Ref: 5.2).</p> <p>NPS Section 5.3 is addressed in sections 5.4, 5.7, 5.9 and 5.10 to 5.13. Geological</p>

Policy/legislation	Key provisions	Section where provision addressed
	<p>and geological conservation effects associated with energy infrastructure, recognising the need to protect the most important biodiversity and geological conservation interests.</p> <p>Where the development is subject to EIA, the applicant should ensure that the ES clearly sets out any effects on internationally, nationally and locally designated sites of ecological or geological conservation importance, on protected species and on habitats and other species identified as being of principal importance for the conservation of biodiversity (NPS Section 5.3.3).</p> <p>The EIA should illustrate where the project has been able to use opportunities to conserve and enhance biodiversity interests (NPS Section 5.3.4) and should aim to avoid significant harm through the use of mitigation and considering reasonable alternatives. Where significant harm cannot be avoided, then appropriate compensation measures should be provided (NPS Section 5.3.7).</p>	<p>interest is addressed in Volume 3, Chapter 6 (Document Ref: 6.3.6).</p> <p>NPS section 5.3.4 is addressed in sections 5.9 and 5.15.</p> <p>Volume 1, Chapter 4: Site Selection and Alternatives (Document Ref: 6.1.4), describes the options and process undertaken to the preferred selection.</p>
National Planning Policy Framework (NPPF)	<p>Section 11 of the NPPF focuses on the natural environment. Paragraph 118 states that if significant harm resulting from a development cannot be avoided, adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused. It goes on to state that proposed development likely to have an adverse effect on a SSSI should not normally be permitted. Where an adverse effect on the site's notified special interest features is likely, an exception should only be made where the benefits of the development clearly outweigh the impacts. It also states that opportunities to incorporate biodiversity in and around developments should be encouraged and notes that the following wildlife sites should be given the same protection as European sites:</p> <ul style="list-style-type: none"> • potential SPAs; • possible SACs; and 	<p>This is addressed in sections 5.4, 5.7, 5.9 and 5.10 to 5.15 and the RIAA (Document Ref: 5.2).</p>

Policy/legislation	Key provisions	Section where provision addressed
	<ul style="list-style-type: none"> • listed or proposed Ramsar sites. 	
Thanet Local Plan 2006 Saved Policies Policy NC3	<p>Development which would be damaging to Sites of Nature Conservation Interest (SNCI) will not be permitted. In the exceptional case where a strategic need is identified, at least an equivalent area of corresponding habitat will be expected to be created at the developer's expense at a suitable location in the district.</p>	<p>This is addressed in sections 5.9 and 5.10 to 5.12.</p>
Draft Thanet Local Plan to 2031 Policy SP24	<p>Biodiversity Enhancements: Biodiversity Opportunity Areas and Green Wedges are protected from inappropriate development, and proposals which would provide enhancements and contribute to a high quality biodiverse environment will be supported.</p>	<p>This is addressed in sections 5.7, 5.9 and 5.15 and the Outline Landscape and Ecological Management Plan (OLEMP) (Document Ref: 8.7).</p>
Draft Thanet Local Plan to 2031 Policy SP25	<p>Development that would have a detrimental impact on European Sites, Sites of Special Scientific Interest or National Nature Reserves will not be permitted.</p> <p>Planning permission may only be granted when it can be demonstrated that any harm to internationally and nationally designated sites resulting from that development will be suitably mitigated.</p>	<p>This is addressed in sections 5.4, 5.7, 5.9 and 5.10 to 5.13 of this chapter and the RIAA (Document Ref: 5.2).</p>
Draft Thanet Local Plan to 2031 Policy GI01	<p>Development which would have a detrimental impact on locally designated wildlife sites will not be permitted unless suitable mitigation can be provided either on or off site within Thanet. Exceptionally, where a strategic need for a proposed development is identified which outweighs the importance of the locally designated sites and cannot be located elsewhere, an equivalent area of habitat will be created elsewhere at a suitable location well related to other existing habitats.</p> <p>Wherever possible and appropriate, new</p>	<p>This is addressed in sections 5.9 and 5.10 to 5.12 of this chapter.</p>

Policy/legislation	Key provisions	Section where provision addressed
	developments will include measures to enhance and connect locally designated wildlife sites.	
Draft Thanet Local Plan to 2031 Policy GI01	On sites where protected species or farmland birds may be present, the Council will require a protected species survey to be carried out alongside any development proposals. Any mitigation necessary should be carried out in line with Natural England's Standing Advice.	This is addressed in sections 5.4, 5.7, 5.9 and 5.10 to 5.12.
Dover District Local Development Framework Core Strategy 2010 Policy DM15	Development which would result in the loss of, or adversely affect the character or appearance of the countryside will only be permitted if, amongst other things, it does not result in the loss of ecological habitats.	This is addressed in sections 5.9 and 5.10 to 5.12.

5.2.2 Account has been taken of the following relevant standards and guidance (see also References section at the end of this Chapter):

- Chartered Institute of Ecology and Environmental Management (CIEEM) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal. 2nd edition 2016;
- PINS Advice note ten: Habitat Regulations Assessment relevant to nationally significant infrastructure projects. Republished November 2017 (Version 8);
- PINS Advice note seventeen: Cumulative effects assessment. Published December 2015 (Version 1); and
- British Standard (BS) 42020:2013, Biodiversity. Code of practice for planning and development.

5.2.3 Guidance on the detailed survey methodologies are summarised in section 5.4 and described in more detail in the respective ecology baseline survey reports (Volume 5, Annexes 5-1 to 5-12) (Document Refs 6.5.5.1-6.5.5.12).

5.3 Consultation and Scoping

5.3.1 Vattenfall Wind Power Ltd (VWPL) undertook its first non-statutory consultation in December 2016 with the publication of its Scoping Report (VWPL, December 2016). Since the publication of the scoping report, meetings and other correspondence with consultees have been undertaken under the auspices of the Thanet Extension Evidence Plan (EP). Consultees that have taken part in the EP process in respect of onshore biodiversity include Natural England; Kent County Council (KCC); Thanet District Council (TDC); Dover District Council (DDC); the Environment Agency (EA); the Royal Society for the Protection of Birds (RSPB) and Kent Wildlife Trust (KWT).

5.3.2 Details of relevant scoping responses and other consultation undertaken up to and including October 2017 were provided in the November 2017 Preliminary Environmental Information Report (PEIR) Volume 3, Chapter 5: Onshore Biodiversity, produced by Amec Foster Wheeler. A summary of the key points arising from this consultation is provided in Table 5.2.

5.3.3 Table 5.2 also contains a summary of the Section 42 consultation responses received with regard to onshore biodiversity, following submission of the PEIR and a summary of relevant consultation that has taken place since the receipt of Section 42 consultation responses. Details of where consultee comments have been addressed in the assessment are also provided in the table.

Table 5.2: Summary of consultation relating to onshore biodiversity

Consultee and consultation type	Key issues raised	Section where comment addressed
SoS (PINS) Scoping Response, 02/2017	A number of points were made regarding the assessment of effects on designated sites and the need to include all designated sites that could be affected in the assessment, including sites that may be affected indirectly and sites that could be affected by cumulative or in-combination effects.	Designated sites which could be affected have been agreed through the EP process (see Evidence Plan Report, Document Ref: 8.5). Further details of designated sites included in the assessment are provided in section 5.7. Potential effects on designated sites are assessed in section 5.1-5.13 and potential effects on European sites are also assessed in the RIAA (Document Ref: 5.2).
	Stated that assessments will be required to be based on up-to-date survey information.	A range of surveys were undertaken between 2016 and 2018 to inform the EIA. Details are provided in section 5.7 with further information included in Volume 5, Annexes 5-1 to 5-12 (Document Refs: 6.5.5.1 – 6.5.5.12). The data set utilised is up to date.

Consultee and consultation type	Key issues raised	Section where comment addressed
	Strongly encouraged the Applicant to agree the scope of surveys with the relevant statutory consultees. Also highlighted the need to resolve any potential effects in relation to designated sites and European Protected Species (EPS) with Natural England. Requested that the assessment follow CIEEM guidelines and make reference to BS 42020: 2013 Biodiversity - Code of Practice for Planning and Development.	The scope of surveys has been discussed and agreed through the EP process (see Evidence Plan Report, Document Ref: 8.5). Regular consultation has been undertaken with Natural England throughout, as highlighted within this table and the Evidence Plan Report (Document Ref: 8.5). The assessment methodology follows CIEEM guidelines (see section 5.5) and the relevant provisions of BS 42020: 2013 have been taken into account.
	Noted Natural England’s request that designated nature conservation sites with dust sensitive ecological receptors should be assessed within 200 m of construction activities.	The assessment of dust impacts is included in Volume 3, Chapter 9: Air Quality (Document Ref: 6.3.9) and is cross referenced within this chapter as appropriate. The assessment includes consideration of ecological receptors in designated sites within 200 m.
	A number of points were made regarding the loss of SSSI habitat at the proposed substation location and the assessment of receptors affected by the possible southern route.	The substation location has since been moved and is no longer within the SSSI. The southern route no longer forms part of the proposed development (see Volume 1, Chapter 4: Site Selection and Alternatives Document Ref: 6.1.4)) and has therefore not been assessed.

Consultee and consultation type	Key issues raised	Section where comment addressed
	A number of points were made highlighting the need to take account of potential impacts relating to noise and vibration, air quality (including dust) and ground conditions (including the mobilisation of contaminants). It was requested that cross reference be made to the appropriate chapters of the ES where these aspects are considered.	Other relevant chapters of the ES are cross referenced throughout this chapter and in the RIAA (Document Ref: 5.2), as appropriate.
	Noted that management plans or mitigation measures may be required in respect of habitat loss, protected species and invasive non-native species.	Embedded mitigation measures are summarised in Table 5.11 with further details provided in the OLEMP (Document Ref: 8.7).
	Stated that the ES should set out the measures for reinstating habitats which are removed during construction and identify the likely locations where there would be loss of important habitats.	Habitat loss is assessed in sections 5.1-5.13. Details of proposed habitat reinstatement and restoration are provided in Table 5.11 with further details provided in the OLEMP (Document Ref: 8.7).

Consultee and consultation type	Key issues raised	Section where comment addressed
		Effects resulting from preventative (planned) maintenance are assessed in section 5.11. Embedded mitigation measures to be employed during preventative maintenance are summarised in Table 5.11 with further details provided in the OLEMP (Document Ref: 8.7).
	Noted that the ornithological assessment should include an assessment of impacts during the O&M phase and ensure that any necessary mitigation is capable of being secured as part of the Outline LEMP or otherwise.	The extent or nature of any unplanned corrective maintenance required can't be predicted at this stage and therefore possible effects can't be assessed. Any unplanned corrective maintenance required would be subject to the necessary consents and the development of appropriate mitigation measures, in consultation with the relevant nature conservation bodies.
	Noted that Natural England strongly encourage the applicant to organise the timing of works so as to avoid impacts to non-breeding bird species forming interest features of designated sites.	Works within the intertidal and at the shoreline will not be undertaken between October and March inclusive. Details are provided in Table 5.11 and the OLEMP (Document Ref: 8.7).

Consultee and consultation type	Key issues raised	Section where comment addressed
	Noted that the HRA should give regard to the continued effectiveness of Pegwell Bay Country Park to manage recreational pressure on the wider SPA if exposed to significant noise intrusion.	Consideration of possible visitor displacement from Pegwell Bay Country Park is included in sections 5.1-5.13, the RIAA (Document Ref: 5.2) and more generally in Volume 3, Chapter 4: Tourism and Recreation (Document Ref: 6.3.4), through reference to site specific data collected pre and during construction of the Nemo Interconnector and other relevant visitor survey data. Embedded mitigation measures are listed in Table 5.11.
	Where documents are intended to remain confidential the Applicant should provide these as separate paper and electronic documents with their confidential nature clearly indicated in the title, and watermarked as such on each page.	Annexes 5-1 and 5-4 (Document Refs: 6.5.5.1 and 6.5.5.4 respectively) contain confidential appendices which are provided separately.
EA Scoping Response 02/2017 EP meetings in 02/2017, 07/2017 and 10/2017 (see Evidence Plan Report, Document ref: 8.5)	<p>Raised concerns regarding the location of the substation within the SSSI.</p> <p>Requested further consultation if Eurasian beaver, shining ramshorn or otter are recorded.</p>	<p>The substation location has since been moved and is no longer within the SSSI (see Volume 1, Chapter 4: Site Selection and Alternatives (Document Ref: 6.1.4)).</p> <p>There were no records of Eurasian beaver, shining ramshorn or otter during surveys carried out in 2017 (see section 5.7).</p>

Consultee and consultation type	Key issues raised	Section where comment addressed
	Satisfied with and agreed to the scope of species and habitat surveys to be conducted. Confirmed that white clawed crayfish need not be considered.	The surveys have been undertaken as agreed.
Natural England Scoping Response 02/2017 EP meetings in 02/2017, 07/2017 and 10/2017 (see Evidence Plan Report, Document ref: 8.5)	Expressed concerns regarding the location of the substation within the SSSI and also requested full consideration of both route options.	The substation location has since been moved and is no longer within the SSSI. The southern route no longer forms part of the proposed development (see Volume 1, Chapter 4: Site Selection and Alternatives (Document Ref: 6.1.4)) and has therefore not been assessed.
	Satisfied with and agreed to the scope of species and habitat surveys to be conducted. Noted that assessment of air quality effects should extend to 200m for designated sites.	The assessment of dust impacts is included in Volume 3, Chapter 9: Air Quality (Document Ref: 6.3.9) and is cross referenced within this chapter as appropriate. The assessment includes consideration of ecological receptors in designated sites within 200 m.
	Ground contamination to be considered given proximity to designated sites. Noted that contamination or pollution incidents could affect bird species as well as other ecological receptors, particularly in terms of affecting their sources of food.	The assessment of potential contamination impacts is included in Volume 3, Chapter 6: Ground Conditions, Flood Risk and Land Use (Document Ref: 6.3.6) and is cross referenced within this chapter as appropriate.

Consultee and consultation type	Key issues raised	Section where comment addressed
	Stated that pre- and post-construction monitoring of saltmarsh and mudflats is required to inform the EIA and HRA.	Saltmarsh and mudflats are addressed in Volume 2 Chapter 5: Benthic Subtidal and Intertidal Ecology (Document Ref: 6.2.5) and in the RIAA (Document Ref: 5.2). Potential effects on birds using saltmarsh and mudflat habitats are assessed in sections 5.1-5.13 of this chapter and in the RIAA (Document Ref: 5.2).
	The Nemo Link project should be included in the cumulative assessment.	Nemo Link has been included in the cumulative effects assessment in section 5.13.
TDC Scoping Response 02/2017 EP meetings in 02/2017, 07/2017 and 10/2017 (see Evidence Plan Report, Document ref: 8.5)	Noted that nitrogen rates and dust will need to be considered in the ecological assessment of European sites. Also noted that noise effects on protected species/sites or other wildlife should be considered.	The assessment of air quality and dust impacts is included in Volume 3, Chapter 9: Air Quality (Document Ref: 6.3.9) and is cross referenced within this chapter as appropriate. Noise impacts on faunal species are assessed in sections 5.1-5.13 of this chapter and in the RIAA (Document Ref: 5.2).
DDC Scoping Response 02/2017 EP meetings in 02/2017, 07/2017 and 10/2017 (see	Requested clarification of the area of interest for the study and potential buffers.	Study areas have been discussed and agreed through the EP process (see Evidence Plan Report, Document ref: 8.5) and are defined in section 5.4 of this chapter.

Consultee and consultation type	Key issues raised	Section where comment addressed
Evidence Plan Report, Document ref: 8.5)	Stated that up to date survey information should be used.	A range of surveys were undertaken between 2016 and 2018 to inform the EIA. Details are provided in section 5.7 with further information included in Annexes 5-1 to 5-12 (Document Refs 6.5.5.1 – 6.5.5.12).
	Satisfied with and agreed to the scope of species and habitat surveys to be conducted.	The surveys have been undertaken as agreed.
KCC Scoping Response 02/2017 EP meetings in 02/2017, 07/2017 and 10/2017 (see Evidence Plan Report, Document ref: 8.5)	Requested data collection and full assessment to be presented in the ES for Option 2 (the southern route).	The southern route no longer forms part of the proposed development (see Volume 1, Chapter 4: Site Selection and Alternatives (Document Ref: 6.1.4)) and has therefore not been assessed.
	Stated that all surveys reports should be appended to ES. Requested use of BS 42020:2013 Biodiversity - Code of Practice for Planning and Development.	All survey reports are appended to the ES (Volume 5, Annexes 5-1 to 5-12 (Document Refs: 6.5.5.1 – 6.5.5.12)). The relevant provisions of BS 42020: 2013 have been taken into account.
	Outline LEMP welcomed. Noted that net gains for biodiversity should be secured.	The OLEMP (Document Ref: 8.7) includes initial proposals for biodiversity enhancements.

Consultee and consultation type	Key issues raised	Section where comment addressed
KWT Scoping Response 02/2017 EP meetings in 02/2017, 07/2017 and 10/2017 (see Evidence Plan Report, Document ref: 8.5)	Object in principle to the proposed development in the NNR.	<p>Objection noted. The site selection process is detailed in Volume 1, Chapter 4: Site Selection and Alternatives (Document Ref: 6.1.4). On balance the preferred option has the least interaction with the qualifying features of the associated European sites and/ or there is greater certainty in the success of proposed mitigation measures compared with the southern route considered previously.</p> <p>Embedded mitigation is proposed to minimise negative impacts within the NNR (see Table 5.11).</p>
	<p>Satisfied with and agreed to the scope of species and habitat surveys to be conducted.</p> <p>Agreed to exchange of data for mutual interest species groups once surveys complete.</p>	<p>Survey data collected for the project have been provided to KWT in the requested format.</p> <p>KWT have not provided survey data for natterjack toad, despite repeated requests (see Consultation Report (Document Ref: 5.1) and Evidence Plan Report (Document Ref: 8.5)).</p>

Consultee and consultation type	Key issues raised	Section where comment addressed
	Discussed route of the cable through the NNR and potential mitigation in line with KWT site objectives.	Consultee views were taken into account in site selection and routing (see Volume 1, Chapter 4: Site Selection and Alternatives (Document Ref: 6.1.4)) and the development of embedded mitigation measures (see Table 5.11 and OLEMP (Document Ref: 8.7)).
RSPB Scoping Response 02/2017 EP meetings in 02/2017, 07/2017 and 10/2017 (see Evidence Plan Report, Document ref: 8.5)	Satisfied with and agreed to the scope of surveys and ornithological study area.	The surveys have been undertaken as agreed.

Consultee and consultation type	Key issues raised	Section where comment addressed
Sandwich Bay Bird Observatory Trust (SBBOT) Meeting March 2017	Requested clarification of the area of interest for the study, potential buffers and survey methodologies. SBBOT agreed to provide contextual data to be included within the HRA and EIA. Stated that up to date survey information should be used.	Study areas have been discussed and agreed through the EP process (see Evidence Plan Report, Document ref: 8.5) and are defined in section 5.4 of this chapter. A range of surveys were undertaken between 2016 and 2018 to inform the EIA. Details are provided in section 5.7 with further information included in Annexes 5-1 to 5-12 (Document Refs: 6.5.5.1 – 6.5.5.12). SBBOT data are summarised in section 5.7 of this chapter, with further details included in Volume 5, Annex 5-4 and Annex 5-14 (Document Refs: 6.5.5.4 and 6.5.5.14 respectively).
DDC Section 42 Consultation Response (12/01/2018)	Noted that the ecological interest is predominantly within Thanet District and offshore and therefore DDC is content to defer to Natural England and KWT.	This is acknowledged although comments have been welcomed from DDC (and any comments made have been addressed).
EA Section 42 Consultation Response (12/01/2018)	Noted that there is reference in the PEIR to survey work relating to species of particular interest to the Environment Agency that were to have been completed in the autumn of 2017. Stated that additional work needs to be done to fill the very significant gaps that have been identified.	Updates to baseline data are included in section 5.7 and associated technical annexes. No material data gaps remain.

Consultee and consultation type	Key issues raised	Section where comment addressed
KCC Section 42 Consultation Response (12/01/2018)	Noted that the PEIR highlighted areas where there may be a need for additional surveys, depending on the final route. Advised that where there is a need for additional surveys, they must be completed prior to the submission of the DCO application.	Updates to baseline data are included in section 5.7 and associated technical annexes. No material data gaps remain.
	Expected the applicant to have reviewed the success of previous mitigation that has been carried out (e.g. for Thanet Windfarm and Nemo Link) to inform the detailed mitigation strategies, particularly within designated sites.	Mitigation undertaken for Nemo Link has been reviewed and the findings incorporated within embedded mitigation proposals in section 5.9. The majority of the onshore cable route for Thanet Offshore Wind Farm was buried beneath the A256 Sandwich Road and therefore mitigation for onshore biodiversity was limited.
	Recommended that the finalised cabling route will need to follow the least sensitive route to ensure the impact on all the designated sites will be minimised.	Volume 1, Chapter 4: Site Selection and Alternatives (Document Ref: 6.1.4), describes the options and process undertaken to the preferred selection.
KCC LEMP Meeting on 19/04/18 – see Evidence Plan Report (Document Ref: 8.5)	Noted that current grazing management may be restricted during construction and other management methods may need to be employed.	The OLEMP (Document Ref: 8.7) addresses potential changes to existing habitat management regimes during construction.

Consultee and consultation type	Key issues raised	Section where comment addressed
	Stated that preference for restoration/ reinstatement within Pegwell Bay Country Park is to species rich grassland using a nutrient poor substrate. VWPL subsequently (by email dated 27/04/18 – see Evidence Plan Report (Document Ref: 8.5) requested more detailed comments from KCC on the substrate to be used and whether seeding should be undertaken.	The OLEMP (Document Ref: 8.7) includes proposals to restore species-rich grassland. More detailed comments were not received from KCC.
	VWPL asked for KCC comments/ preferences on potential biodiversity enhancements within Pegwell Bay Country Park.	Comments were not received from KCC.

Consultee and consultation type	Key issues raised	Section where comment addressed
KWT Section 42 Consultation Response (12/01/2018)	Queried the cable route selection suggesting that a “favoured route” had already been selected by Vattenfall prior to consultation. KWT believe the proposed cable route is potentially a highly environmentally-damaging choice, likely to cause significant harm to an internationally and nationally designated site and strongly object to the proposal.	Detailed consultation was carried out for the different route options prior to the final route option being selected (see Consultation Report (Document Ref: 5.1). Volume 1, Chapter 4: Site Selection and Alternatives (Document Ref: 6.1.4) also describes the options and process undertaken to the preferred selection. On balance the preferred option has the least interaction with the qualifying features of the associated European sites and/ or there is greater certainty in the success of proposed mitigation measures compared with the southern route considered previously. This chapter assesses the potential for significant harm to result from the proposed design and choice of the cable route.
	Expressed concerns regarding cumulative impacts and highlighted the potential for cumulative impacts in relation to the repair of cables for the existing Thanet Offshore Wind Farm.	Cumulative effects are addressed in section 5.13. The Thanet Cable Replacement project is no longer being pursued and is therefore not included in the cumulative assessment.

Consultee and consultation type	Key issues raised	Section where comment addressed
RSPB Section 42 Consultation Response (12/01/2018)	The RSPB considered that the PEIR lacks detail on the amount and location of designated and functionally linked habitat, potentially used by designated wintering bird species of the SPA and SSSI, to be permanently lost. Requested that these points are clarified.	Habitat loss for SPA and SSSI birds is addressed in sections 5.10-5.13.
	The RSPB found the structure of the PEIR chapter particularly unhelpful. Requested a summary table of the baseline features and proposed mitigation.	ES chapter restructured. Evaluation of baseline receptors included in Table 5.8 and Table 5.9. Embedded mitigation measures listed in Table 5.11. Receptors and effects subject to detailed assessment summarised in Table 5.12 and Table 5.13.
	Considered that the methods used for bird surveys are appropriate and welcomed the use of additional data such as WeBS. Nevertheless, with only one year of data collection, and a particularly mild and dry winter during 2016/17 (the survey year), RSPB considered that any conclusions on the magnitude of the impacts for this project are premature.	Baseline data are summarised in section 5.7. Survey methods, including the duration of surveys, were agreed through the EP process, of which RSPB were part. Given the inclusion of a timing restriction for works in the intertidal (see Table 5.11) a second year of winter surveys isn't necessary.
	Were content to read that project activities will be avoiding the winter season from October to March and consider this to be an effective mitigation measure for most impacts on designated wintering bird species of the SPA and SSSI.	Noted. Additional mitigation measures for other potential impacts on designated wintering bird species of the SPA and SSSI are listed in Table 5.11.

Consultee and consultation type	Key issues raised	Section where comment addressed
	Highlighted uncertainties regarding the usage of inland non-intertidal habitat used by European golden plover. Suggested that a single year of surveys may not reflect importance and that daytime surveys will not fully reflect European golden plover use (as daytime surveys may not predict nocturnal habitat choice).	Survey methods were agreed through the EP process, of which RSPB were part. There is no suitable non-intertidal habitat for European golden plover within the RLB and therefore nocturnal surveys are not considered necessary (further details are provided in section 5.7).
	Requested better mitigation and consideration of the red-listed species nightingale, cuckoo and turtle dove.	Embedded mitigation measures listed in Table 5.11 and initial proposals for enhancement, including measures aimed at nightingale and turtle dove, included in the OLEMP (Document Ref: 8.7).
	With respect to little tern RSPB understand that the species is not at present breeding at the SPA but requested guarantees that none of the work will have an impact on the historical breeding site that would prevent the species from recolonising in the future.	The historical little tern breeding site will not be affected (see section 5.7 for further details).
	RSPB disagree that “embedded mitigation for planned O&M in the form of timing” will mitigate for permanent “land take/ land cover change” in designated or functionally linked habitats.	Noted and agreed that timing restrictions will not mitigate for permanent land take/ land cover change. Updated embedded mitigation measures are listed in Table 5.11.

Consultee and consultation type	Key issues raised	Section where comment addressed
	In respect of Schedule 1 birds, RSPB requested more information on how noise impact will be mitigated as well as evidence that screening is an effective mitigation.	Further information regarding proposed mitigation for Schedule 1 birds is provided in Table 5.11 and the OLEMP (Document Ref: 8.7).
Natural England Section 42 Consultation Response (12/01/2018)	Welcomed that site investigation works will take place to determine the feasibility of trenching and burying onshore assets within the country park. Also requested further data regarding the feasibility of landfall options further north and south, particularly around HDD constraints.	Volume 1, Chapter 4: Site Selection and Alternatives (Document Ref: 6.1.4), describes the options and process undertaken to the preferred selection. The project design has been updated to account for the option to bury assets, subject to the findings of the Site Investigation work.
	Noted that there are currently a lot of survey data gaps, which makes it hard to draw conclusions on any potential significant effects upon protected species and sites. Also highlighted a number of uncertainties over whether further surveys were proposed and requested clarification. Noted that if certain species are present a derogation licence from Natural England may be required prior to the start of the works.	Updates to baseline data are included in section 5.7 and associated technical annexes. No derogation licences are considered necessary (see sections 5.1-5.12).
	Requested that a Construction Environmental Management Plan (CEMP) be submitted as soon as possible.	A Code of Construction Practice (CoCP) is included as part of the application (Document Ref: 8.1) and provides the principles that will be followed when drafting the CEMP pre-construction.

Consultee and consultation type	Key issues raised	Section where comment addressed
	Requested further consideration of the possible effects of visitor displacement from Pegwell Bay Country Park to more sensitive areas of the coast and how any effects can be mitigated.	Consideration of possible visitor displacement included in sections 5.1-5.13 and more generally in Volume 3, Chapter 4: Tourism and Recreation (Document Ref: 6.3.4) through reference to site specific data collected pre- and during construction of the Nemo Interconnector and other relevant visitor survey data. Updated embedded mitigation measures listed in Table 5.11.
	Requested further detail in respect of the Ramsar wetland invert assemblage, including an indication as to which habitats species are associated with, an assessment of whether they could be affected by either the onshore cable route or the offshore cable where it comes through the inter-tidal and more detailed mitigation proposals.	Updated assessment of effects on the Ramsar wetland invertebrate assemblage included in sections 5.1-5.12. Updated embedded mitigation measures listed in Table 5.11.
	Requested further information on how the species recorded during the breeding bird surveys have been determined as being representative of the Sandwich Bay to Hacklinge Marshes SSSI notified feature “breeding bird assemblage – lowland open waters and their margins”.	Updated assessment of effects on the SSSI breeding bird assemblage included in sections 5.1-5.13.
	Requested further detail and consideration in respect of the Sandwich Bay to Hacklinge Marshes SSSI invertebrate and plant assemblages.	Updated assessment of effects on the SSSI invertebrate assemblage included in sections 5.1-5.13. Plant assemblages won’t be affected – see section 5.7.

Consultee and consultation type	Key issues raised	Section where comment addressed
	Construction dust impacts on designated sites should be assessed for areas within 200 m, as requested at scoping.	Updated assessment of dust impacts included in Volume 3, Chapter 9: Air Quality (Document Ref: 6.3.9). Includes consideration of ecological receptors within 200 m.
	Noted that the embedded mitigation table included in the PEIR is quite generic. Queried the reference to designated sites assents in the table as these would be covered by the DCO.	Updated embedded mitigation measures listed in Table 5.11.
	Agreed with the conclusion that adverse impacts on SPA qualifying features European golden plover and ruddy turnstone from construction would not be significant following avoidance of the key months of Oct-March for all inter-tidal and shoreline works.	Noted.
	Requested that SSSI notified interest features ringed plover, grey plover and sanderling are considered individually. Agreed that avoidance of the key months of Oct-March for all inter-tidal and shoreline works is likely to be successful but raised concerns regarding ringed plover, peak numbers of which often occur during spring and autumn passage.	Updated assessment of effects on grey plover, sanderling and ringed plover included in sections 5.1-5.13. Updated embedded mitigation measures listed in Table 5.11. Further information regarding passage ringed plover included in Volume 5, Annex 5.14 (Document Ref: 6.5.5.14).
	Welcomed the intention to continue the Oct-March timing restriction on any intertidal or shoreline works throughout the O&M phase.	Noted and applied for construction, decommissioning and planned O&M phase works.

Consultee and consultation type	Key issues raised	Section where comment addressed
	Agreed that likely impacts and embedded mitigation during the decommissioning phase would not be substantially different from construction phase.	Noted and this position is reflected within this chapter (see Table 5.11 and section 5.12).
Natural England Email dated 26/02/18, with further clarification provided by email dated 28/02/18 – see Evidence Plan Report (Document ref: 8.5)	Confirmed that the wetland invertebrate assemblage qualifying feature for the Thanet Coast and Sandwich Bay Ramsar Site refers to the 14 species listed in Section 22 (page 6) of the Ramsar Information Sheet (RIS).	Updated assessment of effects on the Ramsar wetland invertebrate assemblage included in sections 5.1-5.13 and the RIAA (Document Ref: 5.2).
	Confirmed that species forming part of the vascular plant assemblage notified feature for the Sandwich Bay to Hacklinge Marshes SSSI are those included in Table 1 of the Favourable Condition document (copy provided).	Plant assemblages won't be affected – see section 5.7.
	Confirmed that species forming part of the invertebrate assemblage notified feature for the Sandwich Bay to Hacklinge Marshes SSSI are those included in two documents (copies provided).	Updated assessment of effects on the SSSI invertebrate assemblage included in sections 5.1-5.13.
	Confirmed that species forming part of the “Assemblage of breeding birds: Lowland open waters and their margins” notified feature for the Sandwich Bay to Hacklinge Marshes SSSI are those provided within the 1990 criteria sheet (copy provided) plus lapwing, mallard and moorhen.	Updated assessment of effects on the SSSI breeding bird assemblage included in sections 5.1-5.13.
	Confirmed that Natural England’s main concern regarding possible displacement of recreational users from Pegwell Bay Country Park is that people and dogs will be displaced from the Country Park onto Pegwell Bay itself, including extensive areas of sand exposed at low tide, north of the river Stour in particular.	Consideration of possible visitor displacement included in sections 5.1-5.13. Updated embedded mitigation measures listed in Table 5.11.

Consultee and consultation type	Key issues raised	Section where comment addressed
Natural England Letter dated 08/03/18 – see Evidence Plan Report (Document ref: 8.5)	Provided comments on draft reptile survey report. Noted that every effort should be made to reduce the predicted impacts upon common (viviparous) lizard and slow-worm as far as possible. Also stated that sand lizards are unlikely to be affected by the development.	Updated embedded mitigation measures listed in Table 5.11.
	Provided comments on draft badger survey report. Agreed with the conclusions presented in the survey report. Welcomed the recommendation that survey data is updated prior to any proposed works commencing.	Updated embedded mitigation measures (including proposals for pre-construction surveys) listed in Table 5.11. Pre-construction surveys will be undertaken prior to works commencing.
	Provided comments on draft NVC report. Considered that the current NVC survey, plus the addition of the Phase 1 habitat survey has provided sufficient information to determine the baseline conditions and the vegetation communities that occur within the RLB. Recommended that if possible any further data that can be obtained from other sources should be utilised to further strengthen the baseline data.	Updates to baseline data are included in section 5.7. 2012 Kent Habitat Survey also consulted.
	Provided comments on draft terrestrial invertebrate assessment report. Content that the current assessment has provided sufficient data to characterise and evaluate the value of the site for terrestrial invertebrates but expect the desk-based assessment to be updated to cover SSSI assemblage species.	Terrestrial invertebrate report has been updated to cover SSSI assemblage species (Volume 5, Annex 5-6 (Document Ref: 6.5.5.6)).

Consultee and consultation type	Key issues raised	Section where comment addressed
Natural England Meeting (telcon) on 17/05/18 – see Evidence Plan Report (Document Ref: 8.5)	Provided comments on draft bat survey report. Acknowledged that a full season's worth of data is not available. Encouraged the completion of further roost emergence surveys and activity surveys in April and May, as discussed at the EP meeting on 08/02/18, to further strengthen the evidence base.	Additional bat surveys undertaken. Results provided in Volume 5, Annex 5-12 (Document Ref: 6.5.5.12) and incorporated into updated assessment in sections 5.1-5.13.
	Requested an update on additional surveys for great crested newt (GCN) and bats undertaken in spring 2018, including an update on survey access. Agreed that a derogation licence was not required in light of the survey findings and that the approach taken in light of restrictions on access to the Sandwich and Pegwell Bay NNR was reasonable. Requested a pre-construction survey for GCN for the waterbody unable to be accessed in spring 2018.	The results of additional GCN and bat surveys are included in section 5.7 with further detail provided in Volume 5, Annex 5-11 and Volume 5, Annex 5-12 (Document Refs: 6.5.5.11 and 6.5.5.12 respectively). Access restrictions, specifically the refusal by KWT to allow access for surveys in Pegwell Bay Country Park and Stonelees Nature Reserve, are addressed in section 5.6. Proposals for pre-construction surveys are set out in Table 5.11 and the OLEMP (Document Ref: 8.7).
	Requested that the rationale for the route selection should be included in the ES, noting that the sensitivity evidence is important and not just the number of interactions with designated sites.	Volume 1, Chapter 4: Site Selection and Alternatives (Document Ref: 6.1.4) provides details of the route selection process, including consideration of the sensitivity of underlying habitats and uncertainty over potential impacts.

Consultee and consultation type	Key issues raised	Section where comment addressed
	Requested that the OLEMP is provided as soon as possible to enable Natural England to provide comments.	The OLEMP is provided with the application (Document Ref: 8.7).
Thanet District Council Section 42 Consultation Response (16/01/2018)	Noted that KCC, Natural England and Environment Agency would be the key consultees on biodiversity and their expertise should be relied upon. Noted that construction dust and noise and vibration impacts on ecological receptors should be reviewed by the relevant ecological officers at KCC and Natural England.	Noted. Comments on dust and noise provided by KCC and Natural England.

5.4 Scope and Methodology

5.4.1 The development and agreement of the scope of baseline data collection to inform the EIA commenced at the scoping stage and has been refined during the course of the EIA, with changes discussed and agreed as part of the EP process. This section provides a summary of the scope of the baseline data collection carried out and the methodologies used. The methodology used for the impact assessment is set out in section 5.5.

Study Area

5.4.2 The study area for this assessment includes all terrestrial habitats within the RLB plus appropriate buffer zones, to enable the consideration of potential indirect impacts on receptors located outside the RLB. In addition, the study area for birds includes the area within the intertidal RLB, plus an appropriate buffer zone.

5.4.3 The extent of the study area, and therefore the size of appropriate buffer zones, varies according to the ecological receptor in question, based on relevant good practice guidance. The study areas used for the desk study are set out below and the study areas employed during baseline surveys, including appropriate buffer zones, are summarised in Table 5.4 with further details provided in the relevant technical annexes.

5.4.4 The study areas used for baseline data collection have been refined over time, as the development of the project has progressed. At the time of scoping, the proposed development included two options for the landfall and onshore grid connection, north (Pegwell Bay) and south (Sandwich Bay), as illustrated in the scoping report (Figure 1.2). At that stage, the study area for baseline surveys (referred to at that time as the Onshore Area of Interest for ecology surveys (OAoI)) was much larger and included a 500 m buffer zone around the two 25 m wide scoping routes, plus respective receptor-specific buffer zones.

5.4.5 Since that time the RLB has been refined with the final RLB, including three separate options for the landfall, shown in Figure 1.1 *et seq.*, in Volume 3, Chapter 1: Project Description (Onshore). Surveys undertaken later in the project development process have therefore covered smaller areas, defined by the RLB under consideration at that time plus respective receptor-specific buffer zones.

5.4.6 The study area used for the assessment of effects also differs according to receptor, based on relevant guidance and evidence-based research. Further details are provided in the assessment sections (sections 5.1-5.12).

Desk Study

5.4.7 Sources of desk study information are summarised in Table 5.3. Except where stated otherwise, data for designated sites and protected species were obtained through desk studies in February, March and July 2017. Data were obtained for the following areas (measured from the much larger OAoI under consideration at the time), as agreed through the EP process:

- Statutory designated sites located within 2 km;
- European sites with ornithological qualifying features within 20 km;
- Non-statutory sites of biodiversity interest located within 2 km; and
- Records of priority habitats and priority, legally protected and controlled species within 2 km and bat records within 5 km.

Table 5.3: Sources of desk study information

Information obtained	Source of information
Statutory designated sites	MAGIC website (http://magic.defra.gov.uk/home.htm); and Kent and Medway Biological Records Centre (KMBRC).
Non-statutory designated sites	KMBRC.
Priority habitats	MAGIC website (http://magic.defra.gov.uk/home.htm); and KMBRC
Records of legally protected and priority species	KMBRC; and East Kent Badger Group (EKBG).
Ornithological data	<p>BTO:</p> <ul style="list-style-type: none"> Wetland Bird Survey (WeBS) Core Count Survey data 1995/96-2014/15 inclusive, for their Pegwell Bay Core Count sector (which also covers Sandwich Bay), these data being derived from surveys undertaken at, or close to high tide; WeBS Low Tide survey data for 2008/09 (the most recent winter for which data was available) for Pegwell Bay Low Tide count sector (which also covers Sandwich Bay); and Further core count and low tide data for Pegwell Bay from the BTO website (www.bto.org). <p>Natural England: studies commissioned by Natural England into the numbers and distribution of European golden plover in the Sandwich Bay and Thanet area, the results of which are reported in Griffiths (2004) and Henderson and Sutherland (2017);</p> <p>SBBO: annual wildlife reports for 2008-2015 inclusive and report on passage ringed plover (Volume 5, Annex 5-14) (Document Ref: 6.5.5.14);</p> <p>RSPB: bird records within 2 km of the study area;</p> <p>KOS: bird records were extracted from their online database, for all species within 2 km of the study area (http://birdgroups.co.uk/kos/default.asp);</p> <p>Kent Bird Reports 2013 and 2014: (Privett [ed] 2015, 2016); and Kent Breeding Bird Atlas 2008-13 (Clements <i>et al.</i>, 2015).</p>

Information obtained	Source of information
Survey data for the Richborough Energy Park (REP) site and adjacent land	<p>The following reports were provided by REP:</p> <p>Richborough Internal Road and Landscaping – Reptile Mitigation Plan (Greengage Ecology, 2016);</p> <p>Richborough Power Station – Bat Survey Report (Greengage Ecology, 2016);</p> <p>Richborough Energy Park– Great Crested Newt Survey Report (Greengage Ecology, 2017);</p> <p>Richborough Energy Park, Riparian Mammal Survey Report (Greengage Ecology, 2017);</p> <p>Richborough Energy Park - Reptile Survey Report (Greengage Ecology, 2017);</p> <p>Richborough Peregrine Tower, Peregrine Falcon Survey Report (Greengage Ecology, 2016);</p> <p>Richborough Communications Mast Environmental Statement Ecology Chapter (Aecom, 2016);</p> <p>Breeding Bird Survey, Richborough Powerstation & South Richborough Pastures LWS (Wilson, 2016a); and</p> <p>Terrestrial and Freshwater Invertebrate Survey, Richborough Powerstation & Grazing Marsh (Wilson, 2016b).</p>
Data collected for other development proposals within 2 km	<p>Nemo Link:</p> <p>Nemo Link Environmental Statement (TEP, 2013); and</p> <p>Natterjack Toad Survey, Stonelees Nature Reserve (Brady, 2016).</p> <p>Richborough Connection Environmental Statement (National Grid, 2016)</p> <p>St Augustine’s Golf Course breeding bird survey and non-breeding bird survey (KB Ecology, 2014 & 2015).</p>

Field Surveys

5.4.8 A summary of the ecological surveys carried out to inform the preparation of this chapter is provided in Table 5.4. Where the RLB is referred to in Table 5.4 in respect of the survey area this refers to the RLB under consideration at the time of survey. Further information regarding survey methods, survey areas and survey timings is provided in the relevant technical annexes (Volume 5, Annexes 5-1 to 5-12) (Document Refs: 6.5.5.1 – 6.5.5.12).

Table 5.4: Baseline survey details

Survey	Survey Methodology	Survey Area	Survey Period
Phase 1 habitat	In accordance with the Handbook for Phase 1 habitat survey (JNCC, 2010).	Onshore RLB plus a 50 m buffer. Up to 200 m buffer in respect of dust sensitive receptors within statutory designated sites.	Multiple visits March – October 2017. Additional areas not covered in 2017 surveyed in March 2018.
NVC	In accordance with NVC Users' Handbook (Rodwell, 2006).	Onshore RLB (areas within Pegwell Bay Country Park and Stonelees Nature Reserve only)	September – October 2017.
Legally controlled plant species	Included as part of the Phase 1 habitat survey.	RLB plus a 50 m buffer.	March-October 2017 with additional areas surveyed in March 2018.
Terrestrial invertebrates	Combination of site survey (utilising a range of sampling methods) and desk study, including a review of existing species data and consideration of habitat requirements for species forming part of designated site assemblages.	Onshore RLB (areas within Pegwell Bay Country Park and Stonelees Nature Reserve only)	August 2017.
Great crested newt (GCN)	A staged approach to GCN surveys was agreed with Natural England in April 2017. Water bodies were identified from 1:10,000 scale OS maps and aerial photographs of the area (obtained from Google Earth). GCN pond scoping surveys and habitat suitability assessments	All accessible waterbodies within the RLB plus 500 m buffer were subject to scoping surveys and (where required) habitat suitability assessments. All accessible waterbodies of good	Pond scoping surveys and habitat suitability assessments started in February/ March 2017 and continued in combination with the 2017 Phase 1 surveys. eDNA surveys of accessible ponds

Survey	Survey Methodology	Survey Area	Survey Period
	were undertaken in accordance with English Nature (2001), Natural England (2015) and Oldham <i>et al.</i> (2000). eDNA surveys, where required, were undertaken in accordance with Biggs <i>et al.</i> (2014).	suitability or above were subject to eDNA surveys.	took place between 15 April - 30 June 2017. eDNA surveys of ponds within 250 m of the RLB that were initially scoped in for survey but were not able to be accessed in 2017 were completed in May 2018 (where accessible – see section 5.6).
Reptiles	In accordance with Froglife (1999).	All suitable habitats within the RLB excluding the REP site for which existing data are available (Table 5.3).	August to October 2017.
Breeding Birds	Survey methods were dependent on habitat type, but broadly followed Common Bird Census (CBC) method (Bibby <i>et al.</i> , 1992).	OAol (north) plus a 100 m buffer. Habitat appraisal for Schedule 1 species undertaken for the OAol plus a 500 m buffer.	Six survey visits: March - June 2017.
Non-breeding birds (intertidal)	Through-the-tide counts mapping wader and wildfowl distribution on an hourly basis.	Pre-determined observation points at Pegwell Bay (two) and Sandwich Bay to cover a minimum 500 m buffer zone around the intertidal RLB.	Five survey visits: November 2016 - March 2017.
Non-breeding birds	Winter bird walkover/ mapping surveys focussing on	OAol (north) plus a 500 m buffer, where	Six survey visits: November 2016 -

Survey	Survey Methodology	Survey Area	Survey Period
(terrestrial)	wildfowl and waders.	practicable.	March 2017.
Badger	In accordance with Harris <i>et al.</i> (1989).	All land within the RLB excluding the REP site, plus a 50 m buffer (where accessible).	August to November 2017.
Bats	<p>Surveys included:</p> <ul style="list-style-type: none"> - Habitat assessment; - Preliminary roost assessment (structures and trees); - Potential roost feature inspections (Baypoint Clubhouse and several trees); - Potential bat roost surveys (emergence/ return surveys of one tree line); <p>Bat activity surveys, including manual transects and use of automated static detectors;</p> <p>Survey methodologies were based on current Bat Conservation Trust guidelines (Collins, 2016).</p>	All land within and immediately adjacent to the RLB excluding the REP site for which existing data are available (Table 5.3).	<p>August to November 2017.</p> <p>May 2018 (where accessible – see section 5.6).</p>
Otter, water vole and beaver	<p>Water vole survey followed Strachan, Moorhouse and Gelling (2011).</p> <p>Otter survey followed Chanin (2003).</p> <p>Beaver survey followed Scottish Wild Beaver Group (2017).</p>	All potentially suitable watercourses and water bodies within the RLB plus a buffer of 200 m, extended to 500 m where habitats were connected to those within the 200 m buffer.	March - October 2017.

5.5 Assessment Criteria and Assignment of Significance

5.5.1 The CIEEM Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal (CIEEM, 2016) (henceforth referred to as the CIEEM guidelines) form the basis of the impact assessment methodology used in this Chapter. The CIEEM guidelines are widely regarded by the ecology profession as the ‘industry standard’. Note that this approach differs from that set out in Volume 1, Chapter 3: Approach to Environmental Impact Assessment (EIA), with the primary difference being that the CIEEM approach does not use a matrix-based approach to determine whether effects are significant. Further details of the impact assessment methodology used in this Chapter are provided below.

Determining the Importance of Receptors

5.5.2 In accordance with the CIEEM guidelines only ecological receptors (designated sites, habitats, species, ecosystems and their functions/processes), which are considered to be important and could potentially be affected by the proposed development should be subject to detailed assessment. It is not necessary to carry out detailed assessment of receptors that are sufficiently widespread, unthreatened and resilient to impacts from the proposed development and will remain viable and sustainable.

5.5.3 Ecological receptors should be considered within a defined geographical context. For the proposed development the following geographic frame of reference has been used:

- International;
- National;
- Regional (i.e. the southeast of England);
- County (i.e. Kent);
- District (i.e. Thanet/ Dover); and
- Local.

5.5.4 For designated sites, importance reflects the geographical context of the designation. For example, a SSSI is considered nationally important.

5.5.5 In accordance with CIEEM guidelines the value of habitats has been determined against published selection criteria where available. Examples of relevant criteria include Annex 1 of the Habitats Directive, the Section 41 (of the NERC Act 2006) list of habitats of principal importance for the conservation of biodiversity in England, and the list of habitats subject to Habitat Action Plans (HAPs) produced by the Kent Biodiversity Partnership (2018).

5.5.6 In assigning a level of value to a species, it is necessary to consider its distribution and status, including a consideration of trends based on available historical records. Reference has therefore been made to published lists and criteria where available. Examples of relevant lists and criteria include: species of European conservation importance (as listed on Annexes II, IV and V of the Habitats Directive and Annex 1 of the Birds Directive), the Section 41 list of species of principal importance for the conservation of biodiversity in England, the red and amber lists of Birds of Conservation Concern (BOCC) (Eaton *et al.*, 2015) and the list of species subject to Species Action Plans (SAPs) produced by the Kent Biodiversity Partnership (2018).

5.5.7 Ultimately the evaluation of importance for many habitats and species populations will be subject to a degree of professional judgment and it is essential to provide justification for any conclusions reached so that the assessment is transparent. An evaluation of the importance of ecological receptors present within the relevant study areas is provided in Section 5.7, which also includes the rationale for the levels of importance identified.

5.5.8 For the purposes of this assessment, all receptors of at least district value which could potentially be affected by the proposed development are considered important and are therefore subject to detailed assessment. In addition all legally protected or controlled species which are present and where there is potential for a breach of the relevant legislation, are considered important and are also subject to detailed assessment.

Impact Assessment

5.5.9 For each receptor subject to detailed assessment the impact assessment process involves the following steps:

- identifying and characterising impacts;
- incorporating measures to avoid and mitigate (reduce) these impacts (referred to here as embedded mitigation measures);
- assessing the significance of any residual effects after the implementation of embedded mitigation measures;
- identifying appropriate compensation measures to offset significant residual effects (if required); and
- identifying opportunities for ecological enhancement.

5.5.10 The characterisation of impacts has been based on an assessment of the likely impacts of the project, as described in Volume 3, Chapter 1: Project Description (Onshore) and section 5.8: Key Parameters for Assessment, against the baseline identified via the desk study and field surveys. Any likely changes to the baseline prior to the relevant aspect(s) of the project taking place have also been taken into consideration. Relevant published information has been referenced where possible and where professional judgment has been used conclusions drawn are fully justified.

5.5.11 When describing impacts, reference has been made to the following characteristics, as appropriate:

- beneficial, negligible or adverse;
- extent, i.e. the spatial area over which an impact or effect occurs;
- magnitude, i.e. the size of the impact or effect, quantified and expressed in absolute or relative terms, e.g. the amount of habitat lost, wherever possible;
- duration, i.e. the time period over which an effect occurs, which may be temporary or permanent;
- timing and frequency, i.e. the number of times an activity occurs and how this will influence the resulting effect; and
- reversibility, i.e. whether recovery is possible within a reasonable timescale.

5.5.12 Impacts are assessed separately for each phase of the development, i.e. construction, operation and management (O&M) and decommissioning.

5.5.13 Both direct and indirect impacts are considered: direct ecological impacts are changes that are directly attributable to a defined action, e.g. the physical loss of habitat occupied by a species during the construction process. Indirect ecological impacts are attributable to an action, but which affect ecological resources through effects on an intermediary ecosystem, process or receptor, e.g. changes to hydrological or nutrient status, which could lead to changes in habitats some distance from the impact itself.

5.5.14 A number of embedded mitigation measures have been incorporated into the project to avoid and mitigate for potential impacts wherever possible (see section 5.9). These measures include avoidance, i.e. where an impact has been avoided e.g. through changes in scheme design, and mitigation, i.e. measures to reduce or remedy a specific negative impact *in situ*. The assessment of impacts has been undertaken on the basis that these measures will be implemented.

5.5.15 For the purposes of this assessment, in accordance with CIEEM guidelines, a ‘significant effect’ is defined as an effect that either supports or undermines biodiversity conservation objectives for an ‘important ecological receptor’ or for biodiversity in general. Conservation objectives may be specific (e.g. for a designated site) or broad (e.g. national/local nature conservation policy). Effects can be considered significant at a wide range of scales from international to local (see paragraph 5.5.3). For example, a significant effect on a SSSI is likely to be of national significance whilst a significant effect on a population of a species of county importance is likely to be of county significance.

5.5.16 Consideration of conservation status is important for evaluating the effects of impacts on individual habitats and species and assessing their significance:

- habitats – conservation status is determined by the sum of the influences acting on the habitat that may affect its extent, structure and functions as well as its distribution and its typical species within a given geographical area.
- species – conservation status is determined by the sum of influences acting on the species concerned that may affect its abundance and distribution within a given geographical area.

5.5.17 A sequential process has been adopted to avoid, mitigate and compensate for ecological impacts. This is often referred to as the ‘mitigation hierarchy’. Avoidance and mitigation are defined above and have been incorporated into the project (collectively referred to here as embedded mitigation). Compensation and enhancement are defined here as follows:

- compensation describes measures taken to offset residual effects, i.e. where mitigation *in situ* is not possible; and
- enhancement is the provision of new benefits for biodiversity that are additional to those provided as part of mitigation or compensation measures, although they can be complementary

5.5.18 It is noted that there is often considerable overlap between mitigation and compensation measures and biodiversity enhancements. A number of proposed biodiversity enhancements, as required under relevant planning policy, therefore form part of the embedded mitigation set out in section 5.9 (Table 5.11) and the OLEMP (Document Ref: 8.7).

5.6 Uncertainty and Technical Difficulties Encountered

5.6.1 The scope of baseline survey work was discussed and agreed through the EP process. However, as would be expected in any project of this scale, limitations were encountered during some of the field surveys, primarily as a result of difficulties gaining access to land. A summary of the main limitations is provided below with further details provided in the relevant technical annexes (Volume 5, Annexes 5-1 to 5-12) (Document Refs: 6.5.51 – 6.5.5.12). In all cases the limitations encountered are not considered to have affected the validity of the assessment.

5.6.2 A number of the surveys were subject to timing limitations. For example, NVC survey data were collected towards the end of the optimal season for botanical surveys (September and early October 2017). To counter this, NVC data are supplemented by plant species records collected during the course of other survey visits earlier in the season (see Volume 5, Annex 5-1: Extended Phase 1 habitat survey report, Document Ref: 6.5.5.5). Pre-existing habitat data from the Kent Habitat Survey 2012, provided by KMBRC, have also been considered. Given the nature of the habitats surveyed, which are relatively common and widespread, the timing of the survey is not considered to affect the validity of the assessment.

5.6.3 The terrestrial invertebrate assessment did not commence until late in the season and therefore included a single survey visit only, in late August 2017. However, the lack of survey data for the early and mid-season periods has been compensated for by extensive desk-based study. Given the nature of the habitats likely to be affected and the temporary nature of most of the impacts the resulting assessment is therefore considered sufficient to inform the EIA. More detailed survey is also proposed post consent to inform detailed mitigation requirements (see section 5.9).

5.6.4 Bat activity surveys cover the spring and late summer periods but are missing data for June and July. Additional survey effort was employed during the spring and autumn surveys (i.e. extra survey visits, use of additional static detectors, longer recording periods and repeating survey transects) to compensate for this and given the limited extent of potential impacts on foraging bats the lack of data for mid-summer is not considered to affect the validity of the assessment.

5.6.5 The scope and timing of the ornithological surveys was agreed through the EP process with intertidal bird surveys being restricted to the most sensitive winter period. The presence of peak numbers of ringed plover during the spring and autumn passage periods was highlighted subsequently, although it was too late to undertake further surveys by that time. The lack of survey data for the spring and autumn passage periods is compensated for by extensive existing data plus a specific review of passage ringed plover count data for the last five years, undertaken by SBBO (Volume 5, Annex 5-14, Document Ref: 6.5.5.14). As such the lack of spring and autumn passage survey data is not considered to affect the validity of the assessment.

- 5.6.6 Access restrictions prevented access to certain parts of the study area, particularly for third party land within the survey buffer zones beyond the RLB. This has affected a number of surveys including the Phase 1 habitat survey and surveys for GCN, reptiles, bats, water vole and otter. In some cases survey restrictions were temporary, for example survey access to Pegwell Bay Country Park and Stonelees Nature Reserve in spring 2018 was refused by KWT. In such cases surveys were either undertaken on an alternative date or subject to a reduced number of visits. In all such cases the restrictions are not considered to affect the validity of the assessment. In other areas survey has been prevented entirely. Most of these cases refer to areas in which significant effects are unlikely or where existing data are available (e.g. the REP site) and where necessary a precautionary approach has been taken. As such the restrictions are not considered to affect the validity of the assessment.
- 5.6.7 Changes to the RLB during the course of the EIA have meant that some areas were not subject to a full suite of surveys. This particularly applies to the proposed tenant relocation area, which was only added to the RLB in early 2018. This area has been subject to a Phase 1 habitat survey however (see Volume 5, Annex 5-10: Additional Phase 1 habitat survey, Document Ref: 6.5.5.10) and was included within the survey buffer for some species surveys. Given the limited nature of predicted impacts in this area the lack of survey data for other species is not considered a significant omission and where necessary a precautionary approach has been taken.

5.7 Existing Environment

- 5.7.1 Baseline conditions within the relevant study areas (as defined in section 5.4) are summarised in this section. Further details are provided in the technical annexes (Volume 5, Annex 5-1 to 5-14) (Document Refs: 6.5.5.1 – 6.5.5.14).

Statutory Designated Sites

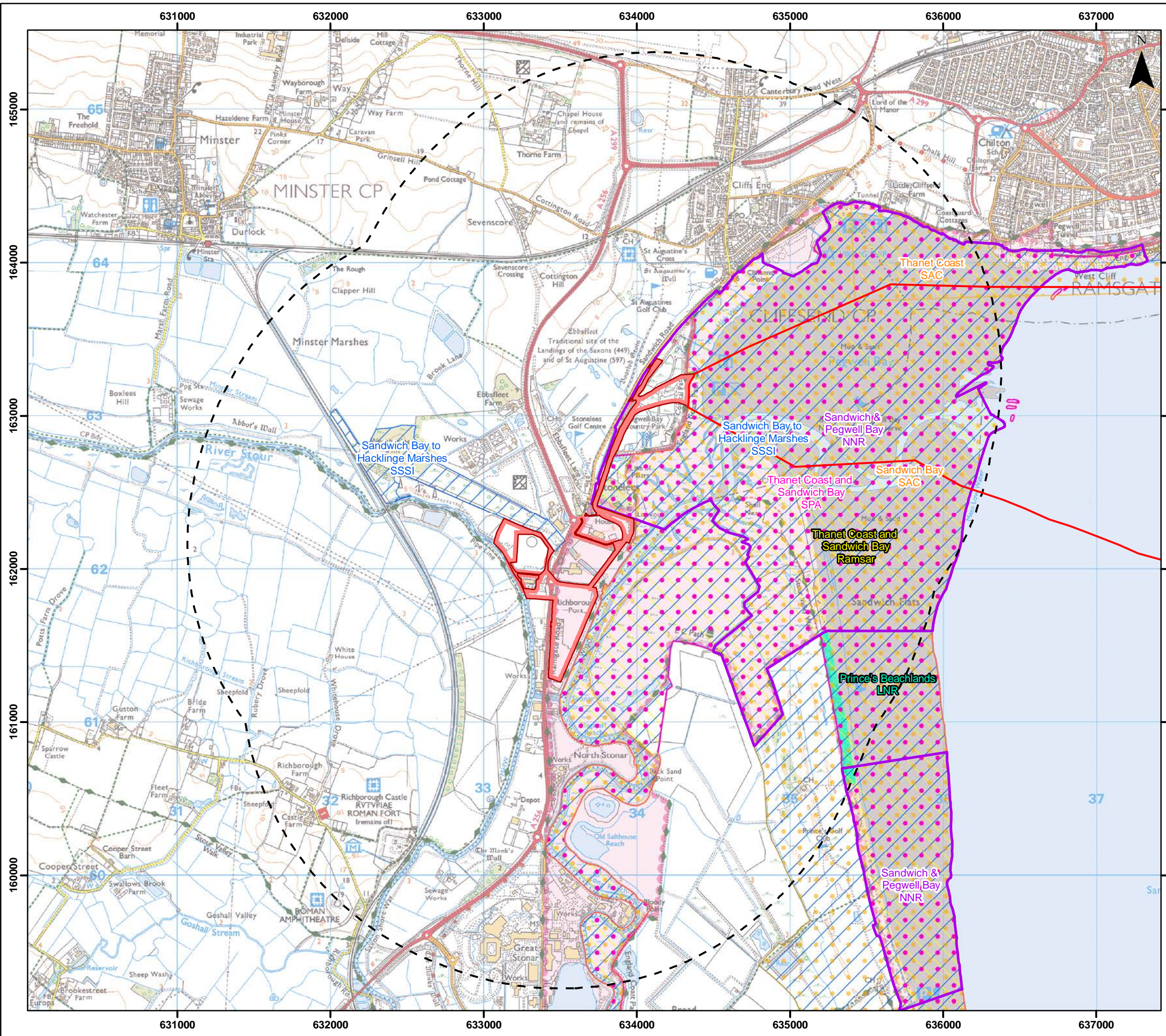
- 5.7.2 Land-based statutory designated sites within 2 km of the onshore and intertidal RLB and European sites designated for their ornithological interest within 20 km of the onshore and intertidal RLB are summarised in Table 5.5. The locations of these sites are shown in Figure 5-1 and Figure 5-2 respectively. Marine designations are not included here but are included in the relevant chapters in Volume 2: Offshore Chapters.

THANET EXTENSION OFFSHORE WIND FARM

Figure 5.1 Land-Based Statutory Designated Sites within 2km

Legend

- Offshore Red Line Boundary
- Onshore Red Line Boundary
- 2km Buffer from Onshore Red Line Boundary
- National Nature Reserve
- Special Area of Conservation
- Special Protection Area
- Sites of Special Scientific Interest
- Ramsar
- Local Nature Reserve



Datum: OSGB 1936
Projection: BNG



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1:25,000

0 0.2 0.4 0.6 0.8 1 km

Drg No	5356.0003 5.1 Land Based Statutory Designated Sites			Figure 5.1
Rev	0.1	Date	03/05/2018	
By	WR	Layout	N/A	

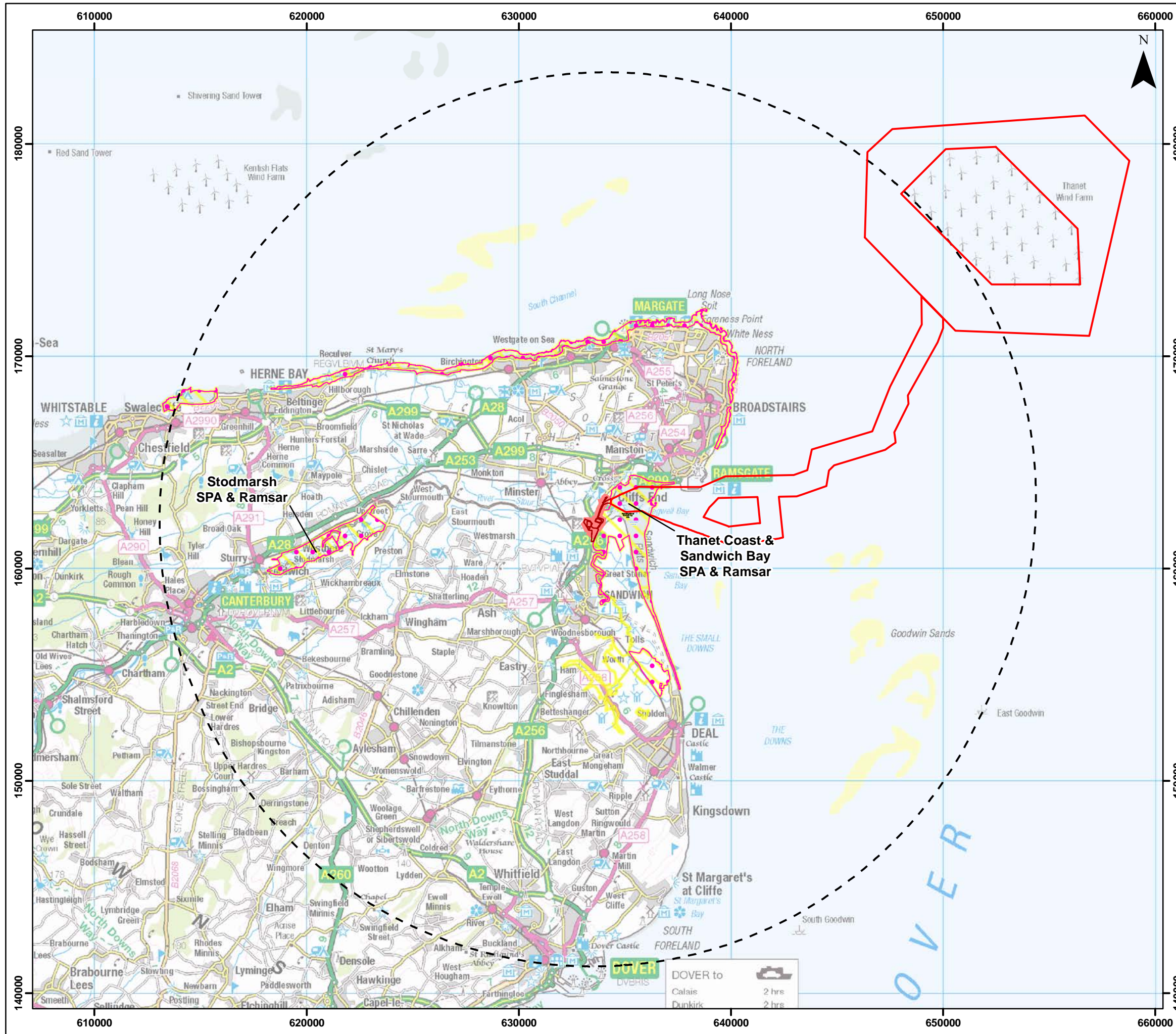


Figure 5.2
Land-Based European Sites with Ornithological Interest within 20km

Legend

- Offshore Red Line Boundary
- Onshore Red Line Boundary
- 20km Buffer from Onshore Red Line Boundary
- Boundary
- Special Protection Area
- Ramsar

Datum: OSGB 1936
Projection: BNG



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1:180,000

Drg No	5356.0003 5.2 Land Based European Sites within 20km			Figure 5.2
Rev	0.1	Date	03/05/2018	
By	WR	Layout	N/A	

DOVER to
Calais 2 hrs
Dunkirk 2 hrs

Table 5.5: Statutory Designated Sites within 2 km of the RLB (20 km for European Sites designated for the Ornithological Interest)

Designated Site	Approximate Distance and Direction from Onshore RLB	Qualifying/ Notified Features ¹
Thanet Coast and Sandwich Bay SPA	Overlaps RLB at landfall and within Stonelees Nature Reserve. Also lies adjacent to east.	Non-breeding European golden plover Non-breeding ruddy turnstone Breeding little tern
Thanet Coast and Sandwich Bay Ramsar	Overlaps RLB at landfall and within Stonelees Nature Reserve. Also lies adjacent to east.	Non-breeding ruddy turnstone Wetland invertebrate assemblage
Sandwich Bay SAC	Overlaps RLB at landfall. Also lies adjacent to east.	Embryonic shifting dunes Shifting dunes along the shoreline with <i>Ammophila arenaria</i> ("white dunes") Fixed coastal dunes with herbaceous vegetation ("grey dunes") Dunes with <i>Salix repens ssp. argentea</i> (<i>Salicion arenariae</i>) Humid dune slacks
Thanet Coast SAC	1.15 km northeast	Reefs Submerged or partially submerged sea caves
Stodmarsh SPA	9.35 km west	Non-breeding great bittern

¹ Excluding geological features.

Designated Site	Approximate Distance and Direction from Onshore RLB	Qualifying/ Notified Features ¹
		Non-breeding hen harrier Breeding gadwall Non-breeding gadwall Non-breeding northern shoveler Breeding bird assemblage Wintering waterbird assemblage
Stodmarsh Ramsar	9.35 km west	Non-breeding great bittern Non-breeding hen harrier Breeding gadwall Passage gadwall Non-breeding northern shoveler
Sandwich Bay and Hacklinge Marshes SSSI	Overlaps RLB at landfall and within Stonelees Nature Reserve. Also lies adjacent to east and northwest.	Aggregations of non-breeding birds – European golden Plover, Aggregations of non-breeding birds - grey plover, Aggregations of non-breeding birds - ringed plover, Aggregations of non-breeding birds - sanderling, Assemblages of breeding birds - lowland open waters and their margins Invertebrate assemblage Lowland ditch systems Population of Red Data Book (RDB) moth - bright wave

Designated Site	Approximate Distance and Direction from Onshore RLB	Qualifying/ Notified Features ¹
		Population of Schedule 8 plant - lizard orchid Population of Schedule 8 plant - bedstraw broomrape S4 - <i>Phragmites australis</i> swamp and reed-beds SD11 - <i>Carex arenaria</i> - <i>Cornicularia aculeata</i> dune community SD12 - <i>Carex arenaria</i> - <i>Festuca ovina</i> - <i>Agrostis capillaris</i> dune grassland SD14 - <i>Salix repens</i> - <i>Campylium stellatum</i> dune-slack community SD2 - <i>Honkenya peploides</i> - <i>Cakile maritima</i> strandline community SD4 - <i>Elymus farctus</i> ssp. <i>Boreali-atlanticus</i> foredune community SD6 - <i>Ammophila arenaria</i> mobile dune community SD7 - <i>Ammophila arenaria</i> - <i>Festuca rubra</i> semi-fixed dune community SD8 - <i>Festuca rubra</i> - <i>Galium verum</i> fixed dune grassland SD9 - <i>Ammophila arenaria</i> - <i>Arrhenatherum elatius</i> dune grassland SM14 - <i>Atriplex portulacoides</i> saltmarsh SM16a - <i>Festuca rubra</i> saltmarsh <i>Puccinellia maritima</i> sub-community SM18 - <i>Juncus maritimus</i> saltmarsh SM21 - <i>Suaeda vera</i> - <i>Limonium binervosum</i> saltmarsh SM24 - <i>Elytrigia atherica</i> saltmarsh SM9 - <i>Suaeda maritima</i> saltmarsh Vascular plant assemblage

Designated Site	Approximate Distance and Direction from Onshore RLB	Qualifying/ Notified Features ¹
Sandwich and Pegwell Bay National Nature Reserve (NNR)	Overlaps RLB within Pegwell Bay Country Park and Stonelees Nature Reserve.	Contains a complex mosaic of habitats including inter-tidal mudflats, saltmarsh, shingle beach, sand dunes, ancient dune pastures, chalk cliffs, wave cut platform and coastal scrubland. It is of international importance for its wader and wildfowl populations.
Prince’s Beachlands Local Nature Reserve (LNR)	1.38 km east	A complex mosaic of habitats of international importance for its bird population.

5.7.3 Further information regarding the statutory sites which overlap the RLB is provided below.

Thanet Coast and Sandwich Bay SPA

5.7.4 Thanet Coast and Sandwich Bay SPA covers 1881.2 ha and lies partly within the RLB, with the saltmarsh and mudflats within the intertidal RLB all lying within the SPA. Stonelees Nature Reserve also lies within the SPA boundary. The intertidal habitats adjacent to Pegwell Bay Country Park also form part of the SPA as do the intertidal habitats along the River Stour, to the east of the RLB.

5.7.5 The site qualifies as an SPA under Article 4.1 of the Birds Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive:

- European golden plover (non-breeding); and
- Little tern (breeding).

5.7.6 This site also qualifies as an SPA under Article 4.2 of the Birds Directive (79/409/EEC) by supporting populations of European importance of the following migratory species:

- Ruddy turnstone.

- 5.7.7 Since the SPA was classified in 1994 little tern has ceased to breed at the site and numbers of European golden plover have declined significantly. The second SPA review (Stroud et al., 2001), which included a comprehensive review of the UK's SPAs, therefore recommended the removal of little tern and European golden plover as qualifying features. The third SPA review (Stroud et al., 2016) also excluded little tern and European golden plover as qualifying species for the SPA. However, the findings of the SPA reviews have yet to be formally ratified and until that time the legal list of qualifying species remains that given on the SPA citation. European golden plover and little tern are therefore both still considered as qualifying features in this assessment.
- 5.7.8 Further details regarding the status of each of the three qualifying species are provided in Volume 5, Annex 5-4: Ornithology Baseline Report (Document Ref: 6.5.5.4) with a summary of key points provided below.
- 5.7.9 The original Thanet Coast SPA citation dated 1992 refers to an average peak count of 1,980 European golden plover during the period 1985/86 – 1989/90, representing 1% of the (then) British wintering population. The Natura 2000 Standard Data Form for the Thanet Coast and Sandwich Bay SPA, dated 2016, refers to a five year peak mean count of 411 European golden plover over the period 1991/92 – 1995/96, representing 0.2% of the GB non-breeding population.
- 5.7.10 The most recent five-year peak mean WeBS core count for European golden plover in the Pegwell Bay WeBS count sector, which includes Sandwich Bay (for 2011/12 – 2015/16) was 2,537. This is less than the current threshold for national importance for this species (4,000 birds). However, a peak count of 4,270 birds was recorded in the SBBO recording area in 2015, indicating that nationally important numbers of European golden plover still occasionally occur in the area.
- 5.7.11 The intertidal surveys undertaken in winter 2016-17 recorded a peak count of 670 European golden plover in Pegwell Bay during the November 2016 survey with lower numbers recorded during subsequent months. The peak count of 670 represents 163% of the SPA population (based on an SPA population of 411, as stated in the Standard Data Form), although it is well below the threshold for national importance for this species.
- 5.7.12 The number of European golden plover occurring in the Thanet area has varied greatly between years, and is currently at a low ebb (Henderson & Sutherland, 2017). Historically, European golden plover have roosted in large numbers (>10,000 birds) at low tide on the intertidal mudflats of Pegwell Bay (Musgrove et al., 2013).
- 5.7.13 Based on WeBS data for the period 2000/01 – 2015/16, European golden plover can be present in Pegwell Bay from late July to early April, although peak numbers occur during the period October to March with much lower numbers outside this period (see Volume 5, Annex 5-4 (Table C2, Appendix C), Document Ref: 6.5.5.4).
- 5.7.14 Henderson & Sutherland (2017) found that European golden plover roost in Pegwell Bay, and forage (and roost) on farmland across a much wider area from Sandwich Bay to the north Thanet coast. Henderson & Sutherland provided no evidence however to indicate that European golden plover regularly utilise terrestrial habitats within or adjacent to the RLB area to any extent, with only occasional birds recorded. European golden plover were only recorded in Pegwell Bay during the surveys in winter 2016-17. The onshore transect surveys undertaken in winter 2016-17 (Volume 5, Annex 5-4, Document Ref: 6.5.5.4) recorded no European golden plover in terrestrial habitats within 500 m of the RLB.
- 5.7.15 Since the production of the PEIR, analysis of non-breeding waterbird distribution in relation to the location of the proposed landfall has been undertaken (see Volume 5, Annex 5-13, Intertidal Waterfowl Data Analysis in Relation to Onshore Works, Document Ref: 6.5.5.13). This examined the numbers and activity of non-breeding waterbirds within 250 m of the location of the proposed landfall, as recorded during surveys carried out in 2016-17. A distance of 250 m was used because significant disturbance beyond 250 m is unlikely (Cutts et al. 2009, Collop et al. 2016).
- 5.7.16 During the 2016-17 surveys a peak count of 390 European golden plover was recorded in the intertidal habitats within 250 m of the landfall (in November 2016), with a further 280 birds recorded in intertidal habitats between 250 m and 500 m from the landfall. Much lower numbers were recorded in the same areas during the December and February surveys and none were recorded in January or March. Although not present consistently, this demonstrates that the area within 250 m of the landfall can therefore support substantial numbers of European golden plover.
- 5.7.17 An overview of the distribution of European golden plover concentrations during the winter 2016-17 survey period is provided in Volume 5, Annex 5-4, (Figure 3, Appendix D) (Document Ref: 6.5.5.4). The distribution of birds within 250 m of the landfall is also shown in Volume 5, Annex 5-13 (Figures 1 and 5) (Document Ref: 6.5.5.13).
- 5.7.18 It is noted that that European golden plover are known to use different habitats to forage in, during the night (Gillings et al., 2005). Terrestrial habitats within and adjacent to the RLB include semi-improved grassland, which is mostly rank and interspersed with scrub, scrub and woodland/scattered trees, amenity grassland and hard standing with early pioneer communities currently used for vehicle storage. None of these habitats are potentially suitable for European golden plover and the species is therefore considered very unlikely to be present in terrestrial habitats within or adjacent to the RLB at night.
- 5.7.19 Little tern has not bred at Pegwell Bay for a number of years with no known breeding records since prior to 1996. The former breeding site was located near to Shell Ness, to the east of the River Stour, outside the RLB.

- 5.7.20 The original Thanet Coast SPA citation dated 1992 refers to an average peak count of 1,340 ruddy turnstone during the period 1986/87 – 1990/91, representing 2% of the East Atlantic Flyway population. The Natura 2000 Standard Data Form for the Thanet Coast and Sandwich Bay SPA, dated 2016, refers to a five year peak mean count of 940 ruddy turnstone over the period 1991/92 – 1995/96, representing 1.4% of the Western Palearctic wintering population.
- 5.7.21 Results from the Thanet Coast Turnstone Monitoring Report (Hodgson, 2016), involving six surveys undertaken from 2001-2010, indicated that the SPA population of turnstone varied from 1,087 to 1,335 birds, with a mean of 1,227. This was followed by another coordinated count in 2013 which suggested that a marked decline has occurred, with just 620 turnstone counted. Further coordinated counts in winter 2013-14 (two counts) and latterly in 2016 (single count) confirmed this decline, with 583, 664 and 537 birds recorded respectively.
- 5.7.22 The most recent five-year peak mean WeBS core count for ruddy turnstone in the Pegwell Bay WeBS count sector (for 2011/12 – 2015/16) was 46. This is supported by data from WeBS low tide counts, results from the winter bird surveys in 2016-17 and from SBBO data, all of which indicate that Pegwell Bay supports a relatively small proportion of the SPA population of turnstone.
- 5.7.23 Ruddy turnstone was recorded on three occasions during the the intertidal surveys undertaken in winter 2016-17 with a peak count of eight. This represents 0.85% of the SPA population. No ruddy turnstone were recorded within 500 m of of the location of the proposed landfall during surveys carried out in 2016-17 (see Volume 5, Annex 5-13, Intertidal Waterfowl Data Analysis in Relation to Onshore Works, Document Ref: 6.5.5.13).
- 5.7.24 Based on WeBS data for the period 2000/01 – 2015/16, ruddy turnstone can be present in Pegwell Bay from July to April, although peak numbers occur during the period November to March with lower numbers outside this period (see Volume 5, Annex 5-4 (Table C2, Appendix C), Document Ref: 6.5.5.4).

Thanet Coast and Sandwich Bay Ramsar

- 5.7.25 Thanet Coast and Sandwich Bay Ramsar covers 2,169.2 ha and where it lies in proximity to the RLB, shares boundaries with the Thanet Coast and Sandwich Bay SPA.
- 5.7.26 The site qualifies under Ramsar Criterion 2 by supporting 15 British RDB wetland invertebrates and under Criterion 6A by supporting species/populations occurring at levels of international importance (in respect of non-breeding ruddy turnstone).
- 5.7.27 Natural England has confirmed (email dated 26th February 2018) that the wetland invertebrate assemblage qualifying feature for the Thanet Coast and Sandwich Bay Ramsar Site refers to the 14 species listed in Section 22 (page 6) of the RIS (note that the RIS only includes 14 species even though the qualification refers to 15 species).

- 5.7.28 A desk-based assessment of the likelihood that species forming part of the qualifying wetland invertebrate assemblage could occur within or adjacent to the RLB has been carried out (see Volume 5 Annex 5-6: Terrestrial Invertebrate Assessment Report, Document Ref: 6.5.5.6). Three wetland invertebrate assemblage species: the wasp *Didineis lunicornis* (referred to by its old name *Alysson lunicornis* in the RIS), the wasp *Ectemnius ruficornis* and the woodlouse *Eluma caelata* (referred to as *E. purpurescens* in the RIS) are considered to have the potential to be present within the RLB based on their known distribution and habitat requirements. All three species favour terrestrial habitats and are only likely to be present in the Stonelees Nature Reserve section of the RLB. The habitat requirements of these three species are summarised below (see Volume 5, Annex 5-6 (Document Ref: 6.5.5.6) for further details):
- *Didineis lunicornis* - strongly associated with patches of sun-baked bare or sparsely vegetated clay soil where deep desiccation cracks develop during summer months. Banks and level ground are both used. Many records relate to coastal soft rock cliffs, whilst inland records include unimproved grasslands (especially south-facing slopes), woodland rides and clearings, and re-vegetating quarries. Females prey on hoppers which are brought to nests typically dug close to waterbodies.
 - *Ectemnius ruficornis* - associated with dead wood (fallen trees, stumps, old fence posts etc.) and dead parts of living trees, in sunny situations and in the vicinity of good stands of umbellifers. Seems to be more of a woodland insect in the southern parts of its British range but it likely has a preference for open woodland such as coppice. Its presence within the RLB is considered unlikely but can't be ruled out.
 - *Eluma caelata* - A woodlouse that has a preference for disturbed habitats, whether this is on the coast (e.g. 'soft' slumping cliffs) or in synanthropic habitats (e.g. waste ground, railway lines and gardens). It typically takes refuge under mat-forming plants, beneath stones and dead wood, or among leaf-litter, tussocks, rubbish and other debris.
- 5.7.29 All other wetland invertebrate assemblage species are not likely to be present within or adjacent to the RLB due to a lack of suitable habitat.
- 5.7.30 The RIS, dated 2008, refers to an average peak count of 1,007 ruddy turnstone during the period 1998/99 – 2002/03, representing 1% of the population. Information regarding more recent population estimates and the number of birds present within the study area was provided in respect of Thanet Coast and Sandwich Bay SPA and is not repeated here.
- 5.7.31 The RIS also refers to a number of other noteworthy flora and fauna (not qualifying features) known to be present within the Ramsar site. Where relevant to the study area these species are discussed in the relevant habitats and species sections below.

Sandwich Bay SAC

- 5.7.32 Thanet Coast and Sandwich Bay SAC covers 1,136.7 ha and lies partly within the RLB, with the saltmarsh and mudflats within the intertidal RLB all lying within the SAC. None of the terrestrial habitats within the RLB are within the SAC
- 5.7.33 The qualifying features of the SAC are listed in Table 5.5 and include a number of sand dune habitats. None of these habitats are present within the onshore RLB, with the closest qualifying habitats located around Shell Ness, to the east of the River Stour.

Sandwich Bay to Hacklinge Marshes SSSI

- 5.7.34 Sandwich Bay to Hacklinge Marshes SSSI covers 1,790 ha and contains the most important sand dune system and sandy coastal grassland in south-east England and also includes a wide range of other habitats such as mudflats, saltmarsh, chalk cliffs, freshwater grazing marsh, scrub and woodland. The SSSI lies partly within the RLB, with the intertidal saltmarsh and mudflats and the terrestrial habitats within Stonelees Nature Reserve all lying within the SSSI. The intertidal habitats adjacent to Pegwell Bay Country Park also form part of the SSSI as do the intertidal habitats along the River Stour, to the east of the RLB and an area of scrub and wetland habitat to the north of the REP site.
- 5.7.35 Further details regarding the status of each of the notified features are provided in the technical annexes (Volume 5, Annexes 5-1 to 5-14, Document Refs: 6.5.5.1 – 6.5.5.14) with a summary of key points provided below.

Aggregations of Non-breeding Birds

- 5.7.36 Non-breeding European golden plover, grey plover, ringed plover and sanderling are all notified features of the SSSI on account of the site (at the time of designation) supporting nationally important numbers. Information regarding European golden plover was provided in respect of Thanet Coast and Sandwich Bay SPA and is not repeated here.
- 5.7.37 The most recent five-year peak mean WeBS core counts for grey plover in the Pegwell Bay WeBS count sector (for 2011/12 – 2015/16) was 312. This is less than the current threshold for national importance for this species (400 birds). The intertidal surveys undertaken in winter 2016-17 recorded a peak count of 146 grey plover in Pegwell Bay, although the peak count recorded within 250 m of the landfall was just seven (see Volume 5, Annex 5-13, Intertidal Waterfowl Data Analysis in Relation to Onshore Works, Document Ref: 6.5.5.13).
- 5.7.38 Based on WeBS data for the period 2000/01 – 2015/16, grey plover can be present in Pegwell Bay throughout the year, with mean peak numbers occurring during the period October to March and lower numbers outside this period (see Volume 5, Annex 5-4 (Table C2, Appendix C) (Document Ref: 6.5.5.4)).

- 5.7.39 The most recent five-year peak mean WeBS core counts for ringed plover in the Pegwell Bay WeBS count sector (for 2011/12 – 2015/16) was 154. This is less than the current threshold for national importance for this species (340 birds). The intertidal surveys undertaken in winter 2016-17 recorded a peak count of just eight ringed plover in Pegwell Bay, of which none were within 250 m of the landfall (see Volume 5, Annex 5-13, Intertidal Waterfowl Data Analysis in Relation to Onshore Works, Document Ref: 6.5.5.13).
- 5.7.40 Based on WeBS data for the period 2000/01 – 2015/16, peak numbers of ringed plover occur during autumn passage in August and September (see Volume 5, Annex 5-4 (Table C2, Appendix C), Document Ref: 6.5.5.4) with lower numbers during the winter (as illustrated by the results of the 2016-17 winter surveys). Relatively large numbers have also been recorded recently on spring passage (see Volume 5, Annex 5-4 (Table C6, Appendix C), Document Ref: 6.5.5.4). As highlighted in section 5.6, and as agreed through the EP process, intertidal bird surveys were restricted to the winter period. A review of passage ringed plover count data for Pegwell Bay collected by SBBO over the last five years (2013-17) was therefore commissioned to address the lack of survey data for the spring and autumn passage periods (see Volume 5, Annex 5-14: Passage of ringed plover in Sandwich Bay, Document Ref: 6.5.5.14). A summary of the key findings of this review is provided below.
- 5.7.41 The peak count of ringed plover in spring during the last five years was 350 in 2015, with peaks of 240 in 2013 and 180 in 2014, 2016 and 2017. Peak numbers are rarely present for more than 24 hours in spring and usually occur between mid-April and late May.
- 5.7.42 The peak count of ringed plover in autumn during the last five years was 250 in 2015, with lower numbers present in other years, i.e. 27 in 2013, 75 in 2014, 135 in 2016 and 100 in 2017. It is noted that historically ringed plover numbers tended to be higher in autumn. Autumn passage is more drawn out than in spring with birds present for longer periods. Peak numbers tend to occur in August and September.
- 5.7.43 Passage ringed plover tend to feed in two main areas: on the mudflats to the northeast of Shell Ness, to the north of the channel of the River Stour; and in the area to the east of Shell Ness, to the south of the main channel. Smaller numbers may also be present on the mudflats to the east of Pegwell Bay Country Park. The main high tide roost is at Shell Ness with smaller numbers using the banks of the River Stour to the southwest of there.

- 5.7.44 The most recent five-year peak mean WeBS core counts for sanderling in the Pegwell Bay WeBS count sector (for 2011/12 – 2015/16) was 118. This is less than the current threshold for national importance for this species (160 birds). The intertidal surveys undertaken in winter 2016-17 recorded a peak count of 76 sanderling in Pegwell Bay, although none were recorded within 250 m of the landfall (see Volume 5, Annex 5-13, Intertidal Waterfowl Data Analysis in Relation to Onshore Works, Document Ref: 6.5.5.13).
- 5.7.45 Based on WeBS data for the period 2000/01 – 2015/16, sanderling can be present in Pegwell Bay throughout the year, with the mean peak numbers occurring from October to March and lower numbers outside this period (see Volume 5, Annex 5-4 (Table C2, Appendix C), Document Ref: 6.5.5.4).

Assemblage of Breeding Birds – Lowland Open Waters and their Margins

- 5.7.46 Natural England has confirmed (emails dated 26th February 2018 and 28th February 2018) that this assemblage includes the following species: little grebe, mute swan, shelduck, mallard, water rail, moorhen, lapwing, ringed plover, snipe, redshank, cuckoo, yellow wagtail, Cetti's warbler, reed warbler, sedge warbler, marsh warbler and reed bunting.
- 5.7.47 Of these species, 12 were recorded breeding within the ornithological survey area during the 2017 surveys. Further information regarding these species is provided in the relevant species sections below and in Volume 5, Annex 5-4: Baseline Ornithology Report (Document Ref: 6.5.5.4).

Invertebrate Assemblage

- 5.7.48 Natural England has confirmed (emails dated 26th February 2018 and 28th February 2018) that the notified invertebrate assemblage includes a total of 70 species. A desk-based assessment of the likelihood that species forming part of the notified invertebrate assemblage could occur within or adjacent to the RLB has been carried out (see Volume 5 Annex 5-6: Terrestrial Invertebrate Assessment Report, Document Ref: 6.5.5.6).

- 5.7.49 The invertebrate assessment concluded that 21 species forming part of the notified invertebrate assemblage (30% of the assemblage species) could potentially be present within or adjacent to the RLB based on an assessment of their specific habitat requirements. It noted however that for some of these species the potential for occurrence is considered to be relatively low whilst a number of these species are actually relatively common and widespread. A total of 14 of the SSSI assemblage species which could potentially be present, including species which utilise a wide range of habitats, are associated with relatively open terrestrial habitats. Nine of the SSSI assemblage species which could potentially be present, including two of the species also associated with open terrestrial habitats, are most likely to be present in intertidal and/or shoreline habitats.
- 5.7.50 The bright wave moth, which is included as a notified feature of the SSSI in its own right, occurs on un-grazed vegetated shingle, golf course 'roughs' on stabilised sand and on sandy undercliffs and is not likely to occur within or adjacent to the RLB.

Vascular Plant Assemblage

- 5.7.51 Natural England has confirmed (emails dated 26th February 2018 and 28th February 2018) that the notified vascular plant assemblage is limited to the following species: sharp rush, divided sedge, fen pondweed and golden samphire. None of these species were recorded during the Phase 1 habitat or NVC surveys undertaken in 2017 and there are no previous records for them within the onshore RLB (see Volume 5, Annex 5-1 and Annex 5-5, Document Refs: 6.5.5.1 and 6.5.5.5 respectively). They are therefore considered unlikely to be present within the onshore RLB.
- 5.7.52 Lizard orchid and bedstraw broomrape are included as notified features of the SSSI in their own right. Neither of these species was recorded during the Phase 1 habitat or NVC surveys undertaken in 2017 and there are no previous records for them within the onshore RLB (see Volume 5, Annex 5-1 and Annex 5-5, Document Refs: 6.5.5.1 and 6.5.5.5 respectively). They are therefore considered unlikely to be present within the onshore RLB.

Habitats

- 5.7.53 The notified features of the SSSI include a number of sand dune and saltmarsh communities, reedbed and lowland ditch systems.
- 5.7.54 There are no sand dunes, reedbed or lowland ditch systems within or adjacent to the onshore RLB. Saltmarsh communities are covered in Volume 2, Chapter 5: Benthic Subtidal and Intertidal Ecology (Document Ref: 6.2.5).

Sandwich and Pegwell Bay NNR

- 5.7.55 Sandwich and Pegwell Bay NNR covers 629 ha, 615 ha of which is managed as a Kent Wildlife Trust Reserve (KWTR). The NNR lies partly within the RLB, with the intertidal saltmarsh and mudflats and the terrestrial habitats within Pegwell Bay Country Park and Stonelees Nature Reserve forming part of the NNR. The intertidal habitats adjacent to Pegwell Bay Country Park also form part of the NNR as do the intertidal habitats along the River Stour, to the east of the RLB.
- 5.7.56 Much of the NNR overlaps with the Sandwich Bay to Hacklinge Marshes SSSI and other designated sites listed above, the interest features for which have been described previously.

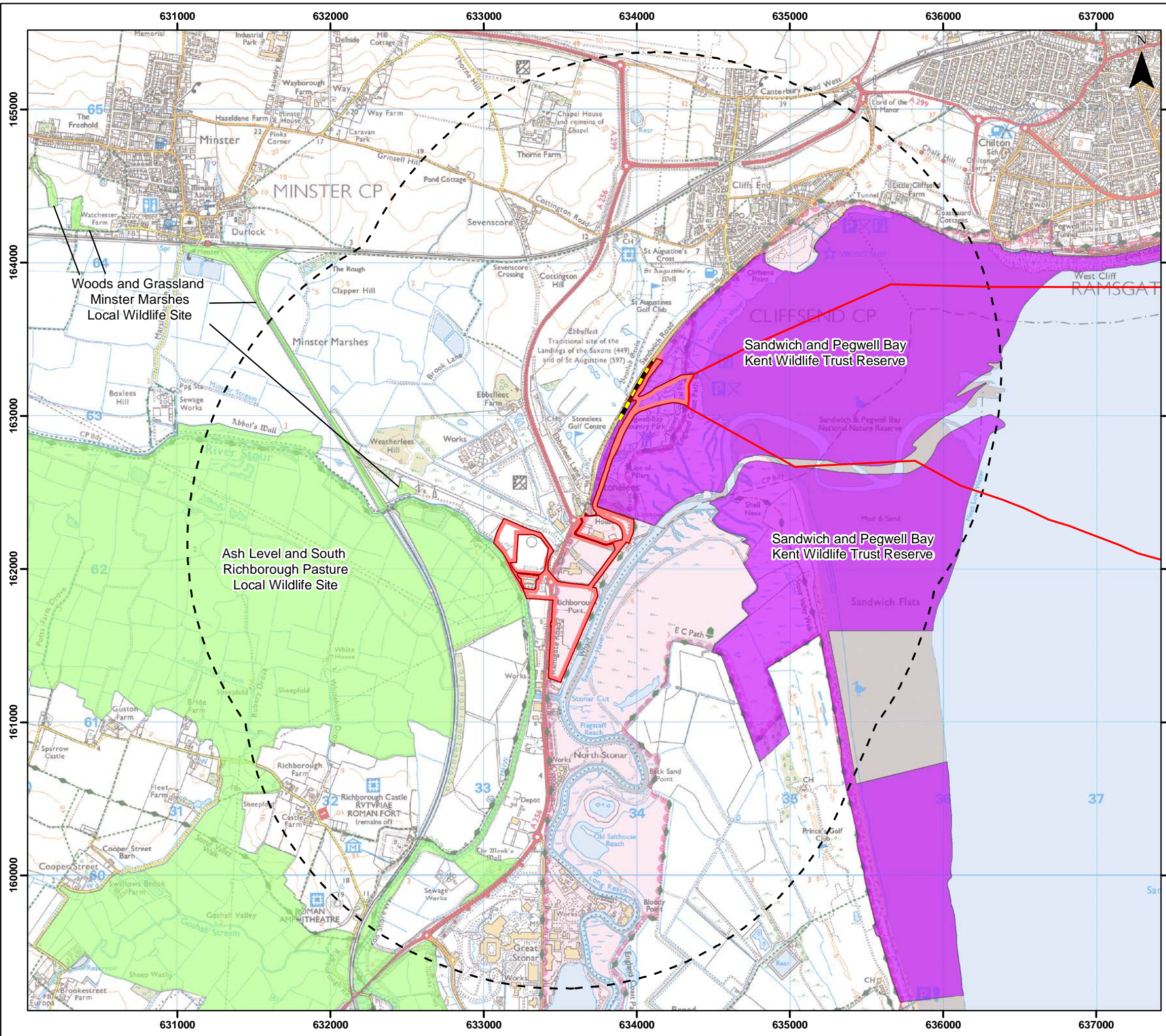
Non-statutory Designated Sites

- 5.7.57 Non-statutory designated sites present within 2 km of the onshore and intertidal RLB are summarised in Table 5.6. The locations of non-statutory designated sites within 2 km are shown in Figure 5-3.

THANET EXTENSION OFFSHORE WIND FARM

Figure 5.3 Non-Statutory Designated Sites within 2km

- Legend**
- Onshore Red Line Boundary
 - Offshore Red Line Boundary
 - 2km Buffer from Onshore Red Line Boundary
 - Roadside Nature Reserve
 - Kent Wildlife Trust Reserve
 - Local Wildlife Site



Datum: OSGB 1936
Projection: BNG



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1:25,000 0 0.2 0.4 0.6 0.8 1 km

Drg No	5356.00003 5.3 Non Statutory Designated Sites within 2km		
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By	WR	Layout	N/A

Figure 5.3

Table 5.6: Non-statutory Designated Sites within 2 km of the RLB

Designated Site	Approximate Distance and Direction from RLB	Reason(s) for Designation
Ash Level and South Richborough Pasture Local Wildlife Site (LWS)	Adjacent to RLB to southwest of REP site.	A large complex of grazing marsh (much of which has been converted to agricultural use), including botanically species rich ditches and supporting species such as the shining ram’s horn snail and wetland birds.
Woods and Grassland Minster LWS	0.58 km west	Consists of a mosaic of habitats including rough grassland, reedbed, a pond, scrub and a small stand of broadleaved woodland, which provides a refuge for wildlife in the surrounding, intensively farmed arable landscape, and enables greater connectivity with nearby designated sites.
A256 (Sandwich Road) Roadside Nature Reserve	Overlaps RLB at access points to temporary construction compound	This flat verge is 450 m long and lies on the east side of Sandwich Road. Plants include bee orchid, buck’s horn-plantain, cow parsley, wild fennel, hedge bindweed, sea couch, Yorkshire fog and wild teasel.
Sandwich and Pegwell Bay KWTR	Overlaps RLB within Pegwell Bay Country Park and Stonelees Nature Reserve.	Forms part of Sandwich and Pegwell Bay NNR (see Table 5.5).

5.7.58 Although not non-statutory designated sites as such, the Kent Nature Partnership has identified a number of Biodiversity Opportunity Area (BOAs) throughout Kent (Kent Biodiversity Partnership, 2018). These are intended to indicate where the delivery of Kent Biodiversity Strategy targets should be focused in order to secure the maximum biodiversity benefits from habitat enhancement, restoration and recreation. The BOAs should not be seen as planning constraint and development of any kind is not precluded (Kent Nature Partnership, 2015). Consideration might be needed in some cases however to ensure that development within a BOA does not significantly increase the fragmentation of wildlife habitats within target areas or neutralize significant opportunities for habitat restoration or recreation.

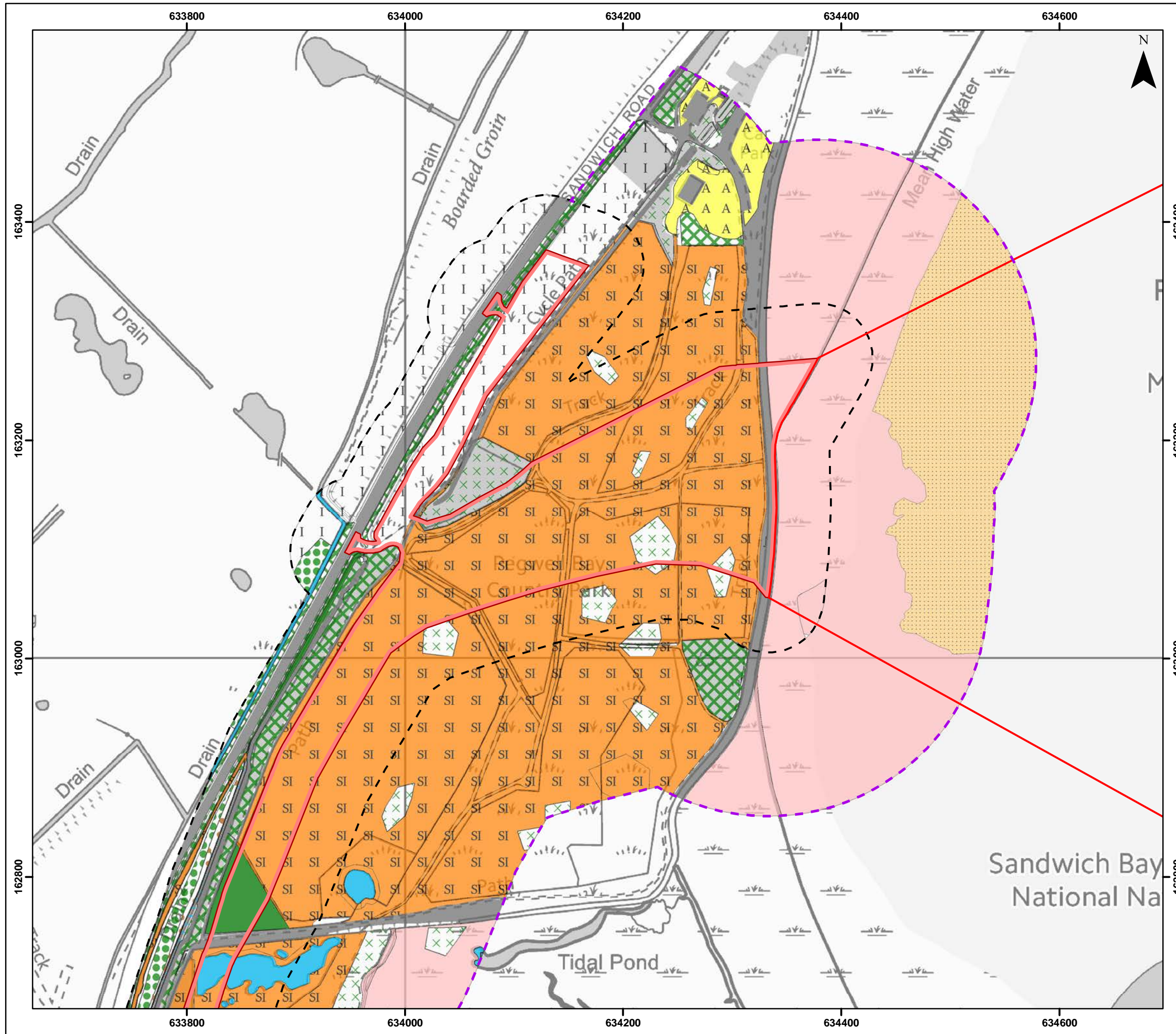
5.7.59 The area within the RLB lies within the Lower Stour Wetlands BOA, which extends from the mouth of the old Wantsum channel across reclaimed marshland to the former mouth of the River Stour, and then continues around the coast to the Sandwich mudflats and sand dunes and the Lydden valley. Targets for the Lower Stour Wetlands BOA which are potentially relevant to the study area, noting the some of these are more relevant to habitats which are covered in Volume 2, Chapter 5: Benthic Subtidal and Intertidal Ecology, include the following:

- “Protect and enhance existing UK BAP priority habitats and designated sites. There should be no net loss of intertidal mudflats and saltmarsh...”
- “Existing natural coastal processes should be maintained, and opportunities taken to... enhance intertidal habitats.”
- “Pursue opportunities to restore and/or recreate intertidal habitats, grazing marsh, fen and reedbed as part of a matrix of natural wetland and coastal habitats.”
- “Enhance at least 15 ha of species-rich grassland to bring it to UK BAP priority habitat quality.”

Habitats

5.7.60 Habitats present within the onshore RLB plus a 50 m buffer (200 m for land within designated sites) have all been subject to a Phase 1 habitat survey with grassland habitats in Pegwell Bay Country Park and Stonelees Nature Reserve also subject to an NVC survey in September-October 2017. The study area was also covered by the Kent Habitat Survey in 2012 and relevant findings from that survey have also been considered.

5.7.61 The results of the Phase 1 habitat survey are provided in detail in Volume 5, Annex 5-1 and Annex 5-10 (Document Refs: 6.5.5.1 and 6.5.5.10 respectively), with the results of the NVC survey provided in Volume 5, Annex 5-5 (Document Ref: 6.5.5.5). The results of surveys of intertidal habitats, including saltmarsh, are provided in Volume 2, Chapter 5: Subtidal and Intertidal Benthic Ecology (Document Ref: 6.2.5). Habitats present within the survey area and their extent are briefly summarised in Table 5.7. A Phase 1 habitat map is included in Figure 5-4 a-d. It should be noted that the Phase 1 habitat survey of Pegwell Bay Country Park took place prior to construction work for the Nemo Interconnector in summer 2017 and the habitats mapped therefore represent those present before the Nemo works took place. Similarly the survey of the REP site took place during ongoing construction works by National Grid and Nemo Link and the mapped habitats may therefore be subject to change as construction continues.



THANET EXTENSION OFFSHORE WIND FARM

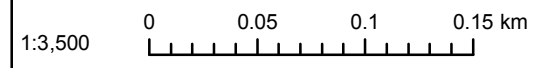
Figure 5.4a Phase 1 Habitat Map

- Legend**
- Onshore Red Line Boundary
 - Offshore Red Line Boundary
 - 50m Buffer from Onshore Red Line Boundary
 - 200m buffer from Onshore Red Line Boundary – Designated Sites Only
- Habitat**
- A1.1.1: Broadleaved woodland - semi-natural
 - A2.1: Scrub- Dense/Continuous
 - A2.2: Scrub- Scattered
 - A3.1: Parkland and scattered trees- broad-leaved
 - B2.2: Neutral grassland - semi-improved
 - B4: Improved grassland
 - B5: Marsh/marshy grassland
 - C3.2: Non-ruderal
 - G1.6: Standing water - brackish
 - G1: Standing water
 - H1.1: Intertidal - mud/sand
 - H2.6: Saltmarsh dense continuous
 - Hardstanding
 - J1.2: Amenity grassland
 - J2.6: Dry Ditch
 - J3.6: Buildings

Datum: OSGB 1936
Projection: BNG

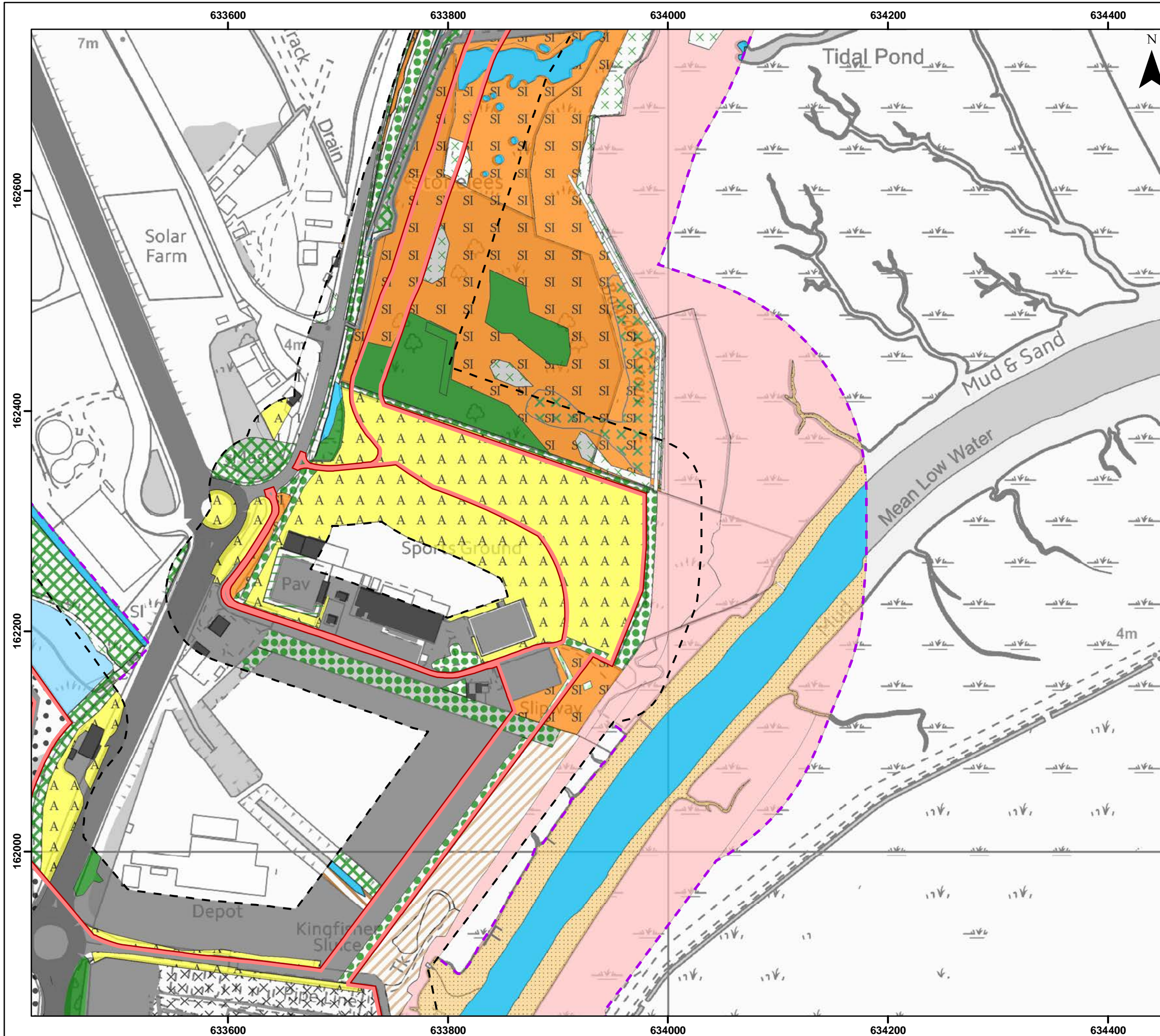


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By	WR	Layout	N/A

Figure 5.4a



THANET EXTENSION OFFSHORE WIND FARM

Figure 5.4b Phase 1 Habitat Map

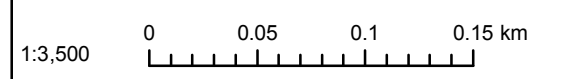
Legend

- Onshore Red Line Boundary
 - 50m Buffer from Onshore Red Line Boundary
 - 200m buffer from Onshore Red Line Boundary – Designated Sites Only
- Habitat**
- A1.1.1: Broadleaved woodland - semi-natural
 - A1.1.2: Broadleaved woodland - plantation
 - A2.1: Scrub- Dense/Continuous
 - A2.2: Scrub- Scattered
 - A3.1: Parkland and scattered trees- broad-leaved
 - A3.2: Parkland and scattered trees- coniferous
 - B2.2: Neutral grassland - semi-improved / A2.2: Scrub- Scattered
 - B2.2: Neutral grassland - semi-improved
 - B4: Improved grassland
 - C3.1: Tall ruderal
 - C3.1: Tall ruderal, Grass & Scrub
 - C3.2: Non-ruderal
 - J1.3: Ephemeral / A2.2: Scrub- Scattered
 - F1: Swamp
 - G1.6: Standing water - brackish
 - G1: Standing water
 - G2: Running water
 - H1.1: Intertidal - mud/sand
 - H2.6: Saltmarsh dense continuous
 - Hardstanding
 - J1.2: Amenity grassland
 - J2.1.2 Species Pool Hedge
 - J2.6: Dry Ditch
 - J3.6: Buildings
 - J4: Bare ground

Datum: OSGB 1936
Projection: BNG

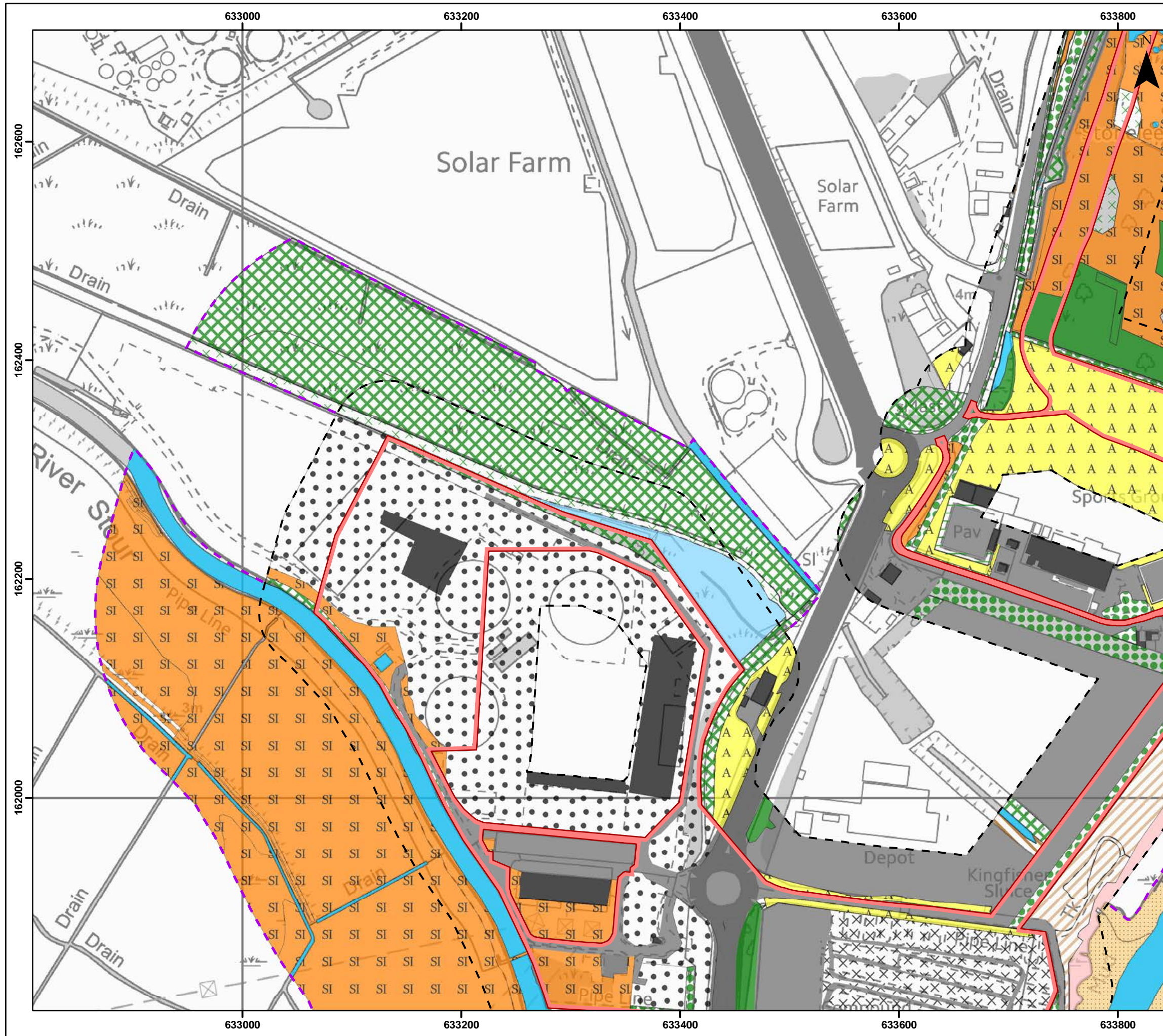


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By	WR	Layout	N/A

Figure 5.4b



THANET EXTENSION OFFSHORE WIND FARM

Figure 5.4c Phase 1 Habitat Map

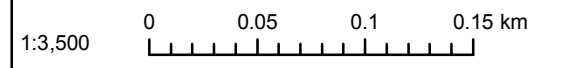
Legend

- Onshore Red Line Boundary
 - 50m Buffer from Onshore Red Line Boundary
 - 200m buffer from Onshore Red Line Boundary – Designated Sites Only
- Habitat**
- A1.1.1: Broadleaved woodland - semi-natural
 - A2.1: Scrub- Dense/Continuous
 - A2.2: Scrub- Scattered
 - A3.1: Parkland and scattered trees- broad-leaved
 - B2.2: Neutral grassland - semi-improved
 - B4: Improved grassland
 - C3.1: Tall ruderal
 - C3.1: Tall ruderal, Grass & Scrub
 - C3.2: Non-ruderal
 - J1.3: Ephemeral / A2.2: Scrub- Scattered
 - F1: Swamp
 - G1: Standing water
 - G2: Running water
 - H1.1: Intertidal - mud/sand
 - H2.6: Saltmarsh dense continuous
 - Hardstanding
 - J1.2: Amenity grassland
 - J2.1.2 Species Poor Hedge
 - J2.6: Dry Ditch
 - J3.6: Buildings
 - J4: Bare ground

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Projection: BNG



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Drg No	5356.00003 5.4a-e Phase 1 Habitat Map			Figure 5.4c
Rev	0.1	Date	03/05/2018	
By	WR	Layout	N/A	



THANET EXTENSION OFFSHORE WIND FARM

Figure 5.4d Phase 1 Habitat Map

Legend

- Onshore Red Line Boundary
 - 50m Buffer from Onshore Red Line Boundary
 - 200m buffer from Onshore Red Line Boundary – Designated Sites Only
- Habitat**
- A1.1.1: Broadleaved woodland - semi-natural
 - A2.2: Scrub- Scattered
 - A3.1: Parkland and scattered trees- broad-leaved
 - B2.2: Neutral grassland - semi-improved / A2.2: Scrub- Scattered
 - B2.2: Neutral grassland - semi-improved
 - C3.1: Tall ruderal, Grass & Scrub
 - J1.3: Ephemeral / A2.2: Scrub- Scattered
 - G1: Standing water
 - G2: Running water
 - H1.1: Intertidal - mud/sand
 - H2.6: Saltmarsh dense continuous
 - Hardstanding
 - J1.2: Amenity grassland
 - J3.6: Buildings
 - J4: Bare ground

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1:3,500

0 0.05 0.1 0.15 km

Drg No	5356.00003 5.4a-e Phase 1 Habitat Map		
Rev	0.1	Date	03/05/2018
By	WR	Layout	N/A

Figure 5.4d

Table 5.7: Phase 1 Habitats within the Study Area

Phase 1 Habitat Type	Extent (ha)			Notes
	Within Onshore RLB	Within 50 m Buffer	Within 200 m Buffer (Designated Sites Only)	
Broad-leaved woodland – semi-natural	1.24	1.12	0.36	Small blocks of semi-mature woodland are present within Stonelees Nature Reserve and Pegwell Bay Country Park
Broad-leaved woodland – plantation	-	0.0008	-	A strip of planted poplar trees forms the northern boundary of the Baypoint Sports Club site.
Dense/continuous scrub	0.35	2.93	4.60	Areas mapped as dense scrub are scattered within Pegwell Bay Country Park and alongside Sandwich Road.
Scattered scrub	0.38	1.21	1.84	Scattered scrub is present throughout Pegwell Bay Country Park and Stonelees Nature Reserve, mostly in mosaic with semi-improved neutral grassland. Scattered scrub is also present within the SSSI on the eastern side of the River Stour (the Samfer field). Small patches of immature scrub are present in places within the tenant relocation area.
Parkland and scattered trees – broad-leaved	0.72	2.32	-	Scattered broad-leaved trees are present alongside Sandwich Road, around the peripheries of the Baypoint Sports Club site and along

Phase 1 Habitat Type	Extent (ha)			Notes
	Within Onshore RLB	Within 50 m Buffer	Within 200 m Buffer (Designated Sites Only)	
				the eastern boundaries of the British Car Auctions land, the proposed substation site and the proposed tenant relocation area.
Parkland and scattered trees - coniferous	0.04	-	-	A small number of coniferous trees are present in the 50 m buffer, to the west of Sandwich Road.
Neutral grassland – semi-improved	6.98	8.98	17.87	<p>Semi-improved neutral grassland is the dominant habitat throughout much of Pegwell Bay Country Park and Stonelees Nature Reserve. Where this was mapped to NVC level the dominant community was MG1 <i>Arrhenatherum elatius</i> grassland. A number of open ground communities were also recorded, including the OV10 <i>Poa annua – Senecio vulgaris</i>, OV21 <i>Poa annua – Plantage major</i>, OV22 <i>Poa annua – Taraxacum officinale</i> and OV24 <i>Urtica dioica – Galium aparine</i> communities. These areas were mapped as coarse neutral grassland in the 2012 Kent Habitat Survey.</p> <p>Semi-improved neutral grassland is also present in the 50 m buffer to the southwest of the REP site (to the south of the river) and within the SSSI to the east of the River Stour (the Samfer Field). Both of these areas were mapped as semi-improved grazing marsh pasture in</p>

Phase 1 Habitat Type	Extent (ha)			Notes
	Within Onshore RLB	Within 50 m Buffer	Within 200 m Buffer (Designated Sites Only)	
				the 2012 Kent Habitat Survey.
Improved grassland	0.93	1.87	0.40	Small areas within Pegwell Bay Country Park and parts of the golf course within the 50 m buffer to the west were mapped as improved grassland.
Tall ruderal	0.001	1.17	-	Small patches of tall ruderal are present within Pegwell Bay Country Park and within the 50m buffer (some of which are mapped as a mosaic with grassland and scrub).
Non-ruderal	-	0.09	-	Small patches of non-ruderal vegetation are present within the 50 m buffer.
Standing water	0.08	0.31	0.40	A number of small pools within Stonelees Nature Reserve have been mapped as standing water, although all are ephemeral and dry for much of the summer. At least one of these is located within the RLB (no other pools appear to be present within the RLB based on aerial photos, although identification is made difficult as all pools were dry at the time aerial photos were taken and walkover surveys were completed). One other pond is present within the survey area, in the southern part of

Phase 1 Habitat Type	Extent (ha)			Notes
	Within Onshore RLB	Within 50 m Buffer	Within 200 m Buffer (Designated Sites Only)	
				<p>Pegwell Bay Country Park.</p> <p>Brackish water bodies are present within the saltmarsh to the north and south of Pegwell Bay Country Park (within the 200m buffer).</p> <p>A number of wet ditches are present within the 50 m buffer zone, both within the golf courses to the west and to the southwest of the REP site.</p> <p>The Minster Stream, where it passes through the 50 m buffer, has also been mapped as standing water as flow is controlled by sluice gates at either end.</p>
Running water	0.02	2.47	11.11	The River Stour flows from south to north within the buffer zone to the east of the RLB and from northwest to southeast within the buffer zone to the southwest of the REP site.
Intertidal mud/sand	-	0.47	8.42	See Volume 2, Chapter 5: Subtidal and Intertidal Benthic Ecology (Document Ref: 6.2.5).
Saltmarsh – dense/continuous	0.17	3.66	19.27	See Volume 2, Chapter 5: Subtidal and Intertidal Benthic Ecology (Document Ref: 6.2.5).

Phase 1 Habitat Type	Extent (ha)			Notes
	Within Onshore RLB	Within 50 m Buffer	Within 200 m Buffer (Designated Sites Only)	
Amenity grassland	2.47	2.94	0.54	Most of the Baypoint Sports Club site comprises amenity grassland (sports pitches). There are also small areas of regularly mown grassland, mapped as amenity grassland, around the car park at Pegwell Bay Country Park and next to roads within the REP site.
Ephemeral/ short perennial	4.07	0.43	-	Ephemeral/short perennial habitat is present in the eastern part of the proposed substation site and tenant relocation areas, where it has formed on old areas of hardstanding which have fallen into disrepair. In some areas, where habitats are further developed, these habitats form a mosaic with grassland and scattered scrub habitats.
Dry ditch	-	0.12	-	A number of dry ditches are present within the 50 m buffer zone. The ditch running along the eastern side of Sandwich Road from the Baypoint Sports Club northwards has been mapped as a dry ditch, although at the time of the additional Phase 1 habitat survey in March 2018 the southern part of this ditch contained standing water.

Phase 1 Habitat Type	Extent (ha)			Notes
	Within Onshore RLB	Within 50 m Buffer	Within 200 m Buffer (Designated Sites Only)	
Buildings	-	2.13	0.003	There only buildings within the RLB are located within the former Richborough Port site and include metal storage units, porta-cabins and other similar structures.
Bare ground/ hardstanding	14.22	14.18	1.06	Bare ground/ hardstanding is present throughout much of the proposed substation site, the tenant relocation area and the REP site.

Invasive Non-native Species

- 5.7.62 During the Phase 1 habitat surveys any evidence of controlled species observed within the RLB and a minimum 7 m buffer such as Japanese knotweed, New Zealand pigmyweed, giant hogweed, water fern and Himalayan balsam was noted and mapped.
- 5.7.63 Japanese knotweed was recorded in three small stands within the roadside verge alongside Sandwich Road (Volume 5, Annex 5-1 (Document Ref: 6.5.5.1), Appendix E, TN19). New Zealand pygmyweed was recorded in two drainage ditches (Volume 5, Annex 5-1, Appendix E, TN9 and TN10, Document Ref: 6.5.5.1) over 100 m to the west of the RLB on the other side of the River Stour.

Faunal Species

Terrestrial Invertebrates

- 5.7.64 The results of the terrestrial invertebrate assessment are presented in full in Volume 5, Annex 5-6: Terrestrial Invertebrate Assessment Report (Document Ref: 6.5.5.6) with a brief summary of key findings provided below.
- 5.7.65 The terrestrial invertebrate assessment focussed on the habitats within Pegwell Bay Country Park and Stonelees Nature Reserve, which following an initial walkover survey, were considered to have the greatest potential value for terrestrial invertebrates.

- 5.7.66 The potential for these areas to support species forming part of the Thanet Coast and Sandwich Bay Ramsar wetland invertebrate assemblage or the Sandwich Bay to Hacklinge Marshes SSSI invertebrate assemblage was considered previously (paragraphs 5.7.27-5.7.29 and 5.7.48-5.7.50) and is not repeated here.
- 5.7.67 A total of 77 species of terrestrial invertebrate were recorded during the survey, including four nationally rare or scarce species, the nationally rare Chalcid wasp *Brachymeria minuta*, the nationally scarce rove beetle *Paederus fuscipes*, the red bartsia bee and the sharp-collared furrow bee. In addition five Local species were found within the study area. It is noted that further survey effort earlier in the season would almost certainly have identified additional invertebrate species within the study area, potentially including additional rare or scarce species. However, the current survey has identified the broad habitat types within the study area likely to support invertebrates of conservation interest and therefore further survey to confirm the exact species present is not considered necessary to inform this impact assessment.
- 5.7.68 The potential for areas within or adjacent to the RLB that were not covered by the terrestrial invertebrate assessment presented in Annex 5-6 (Document Ref: 6.5.5.6) to support notable invertebrate populations is considered in the following paragraphs.
- 5.7.69 The proposed substation site and tenant relocation area was not included in the terrestrial invertebrate assessment due to lack of access or the areas not forming part of the RLB at the time. These areas were visited in March 2018 (during Phase 1 habitat surveys) when an assessment of their potential to support notable invertebrate communities was made.
- 5.7.70 An area of approximately 4.2 ha, representing a mosaic of ephemeral/short perennial and scattered scrub habitats, has developed on former hardstanding along the eastern side of the proposed substation site and tenant relocation area. The ground is level, with a lack of banks and hollows favoured by important groups such as mining bees. It is also relatively exposed (and therefore subject to wide ranges of temperature and humidity, which may also serve as a limiting factor to the presence within the site of a invertebrate diversity. Some of this area is currently used for HGV storage.
- 5.7.71 The mosaic of ephemeral/ short perennial vegetation and scattered scrub is likely to favour the presence of a mix of arboreal and field layer assemblages, particularly including bees, sawflies (Symphyta) and wasps (i.e. aerial nesters), butterflies and moths (Lepidoptera), true flies (Diptera) and beetles (Coleoptera). The mats of bryophyte-rich vegetation will also likely support a range of ground-based invertebrates such as ground bugs (Lygaeidae), hoppers (Auchenorrhyncha), a range of spiders (Aranaea), Myriapods (woodlice, centipedes and millipedes), land snails (Mollusca Gastropoda), ground beetles (Carabidae), ants (Formicidae) and grasshoppers and crickets (Orthoptera). Given the nature of the habitats present and the site's geographical location in southeast Kent the area might be expected to support a number of locally, regionally and nationally rare or scarce species. However, the lack of topographic diversity and high level of exposure is likely to limit the number of species present. The invertebrate assemblage is therefore considered unlikely to be exceptional.
- 5.7.72 The REP site was not included in the invertebrate assessment due to a lack of access. However, an invertebrate survey of the REP site was undertaken in 2016 (Wilson, 2016b). This evaluated the invertebrate community present across the short, flower-rich open habitats and scrub communities supporting a saproxylic (wood decay) fauna that were present within the REP site at that time to be of national significance. However, none of these habitats were present within the parts of the REP site that could be affected by the proposed development during the Phase 1 habitat survey in March 2018, with the majority of the area forming part of a major construction site at that time.
- Reptiles*
- 5.7.73 KMBRC provided several records of common (viviparous) lizard within 2 km of the RLB (Volume 5, Annex 5-1: Extended Phase 1 Habitat Survey Report, Document Ref: 6.5.5.1). The results of the reptile surveys are presented in full in Volume 5, Annex 5-7: Reptile Survey Report (Document Ref: 6.5.5.7) with a brief summary of key findings provided below.
- 5.7.74 The surveys confirmed the presence of reptiles in all the component survey areas, including Pegwell Bay Country Park, Stonelees Nature Reserve and around the fringes of the Baypoint Sports Club site and the proposed substation site. Two species were recorded, viviparous lizard and slow-worm.
- 5.7.75 A good population of viviparous lizard, based on Froglife (1999) guidelines, was recorded in Pegwell Bay Country Park and Baypoint Sports Club and low populations were recorded in Stonelees Nature Reserve and at the proposed substation site. Slow-worm was only recorded in Pegwell Bay Country Park where the numbers indicate a low population based on Froglife (1999) guidelines.

- 5.7.76 The tenant relocation area was not included within the RLB at the time of survey so was not surveyed. It is likely that this area supports a relatively small population of viviparous lizard, as is present in similar habitats within the proposed substation site.
- 5.7.77 The REP site was not accessible for survey, although a reptile survey took place there most recently in 2016 (Greengage Ecology, 2017c). These surveys identified exceptional populations of slow worm, good populations of common (viviparous) lizard and low populations of grass snake, based on Froglife guidelines. It is understood that since that survey a reptile mitigation programme has taken place and no suitable habitats for these species were present within the parts of the REP site that could be affected by the proposed development in March 2018.

Amphibians

- 5.7.78 The data search carried out by KMBRC provided no records of great crested newt (GCN) within 2 km of the RLB. Brady (2016) also states that although GCN has previously been recorded from a garden pond near Ramsgate, this species is not believed to be native to the local area.
- 5.7.79 Detailed results of surveys for GCN in 2017 and 2018 are presented in Volume 5, Annex 5-3: Great Crested Newt Survey Report and Annex 5-11: Additional Great Crested Newt Survey Report (Document Refs: 6.5.5.3 and 6.5.5.11) respectively. A brief summary of key findings is provided below.
- 5.7.80 In 2017, 133 water bodies were identified within 500 m of the RLB under consideration at that time, of which 110 were able to be accessed. Of these just 14 were initially determined to be potentially suitable for GCN. Seven of these 14 water bodies were subject to an eDNA survey in 2017. No evidence of GCN was recorded. Of the remaining seven potentially suitable water bodies, six were unable to be accessed for eDNA survey at that time and one was completely dry so was not able to be surveyed. Two of the water bodies unable to be surveyed in 2017 are located within 250 m of the RLB, one of which was subject to eDNA survey in April 2018 (permission to access the other waterbody, in Pegwell Bay Country Park, was refused by KWT). No evidence of GCN was recorded. The other five water bodies are all located over 250 m from the RLB and survey was not considered necessary.
- 5.7.81 Of the 23 water bodies unable to be accessed, most are drainage ditches to the west of the RLB which based on the evidence of similar ditches in the surrounding area are not likely to be suitable for GCN. A survey of the REP site and surrounding area in 2016 (Greengage Ecology, 2017b) found no suitable water bodies in the REP site or within 500 m.
- 5.7.82 Based on the above GCN are considered likely to be absent from the study area.

- 5.7.83 Although no records of natterjack toad were provided by the desk study, it is understood that natterjack toads were reintroduced to a number of specially created ephemeral pools within Stonelees Nature Reserve by KWT between 2003 and 2005 (WSP Parsons Brinckerhoff, 2016b).
- 5.7.84 Natterjack toadlets were identified at the site in 2009 and 2010 (TEP, 2013). During surveys undertaken in 2011 a single natterjack toad was identified and in 2012 tadpoles were recorded in two ponds (TEP, 2015, cited by WSP Parsons Brinckerhoff, 2016b). In 2014, surveys undertaken by TEP on behalf of the Nemo Link project recorded two adults and one juvenile toad, although no evidence of breeding was recorded (WSP Parsons Brinckerhoff, 2016b).
- 5.7.85 Another survey was undertaken in 2016 on behalf of the Nemo Link project (Brady, 2016) but this recorded no evidence of natterjack toads, following which it was determined that mitigation for natterjack toad during construction of the Nemo Link was no longer required. It is understood that further survey data may be held by KWT but the results have not been made available, despite repeated requests (see Consultation Report, Document Ref: 5.1).
- 5.7.86 On current knowledge it is considered unlikely that natterjack toad is still present within the study area.

Birds

Breeding Birds

- 5.7.87 Full details of breeding bird surveys undertaken in 2017, along with a summary of a number of existing sources of breeding bird data for the study area, are provided in Volume 5, Annex 5-4: Ornithology Baseline Report (Document Ref: 6.5.5.4). A brief summary of findings for key species is provided below.
- 5.7.88 Four species included on Schedule 1 of the Wildlife & Countryside Act 1981 were recorded breeding (or considered likely to be breeding) within the study area in 2017: peregrine falcon, marsh harrier, kingfisher and Cetti's warbler.
- 5.7.89 Two pairs of peregrine were identified during the survey in 2017, one of which was successful. One of these pairs is located [REDACTED] at the REP site, over 300 m from the RLB. The other pair is located over 500 m from the RLB. The nest site at the REP site was also occupied in 2016 (Wilson, 2016a).
- 5.7.90 A single pair of marsh harrier attempted to breed at one location within the ornithological study area in 2017 and breeding may have been attempted at a second site just south of the study area. Both locations are more than 500 m from the RLB.

- 5.7.91 There were regular sightings of kingfisher flying up and down the River Stour to the southwest of the REP site during the 2017 surveys but although birds were seen carrying food the nest site was not located. Kingfisher was also recorded in this area in 2016 (Wilson, 2016a), the species was considered to have bred somewhere along the River Stour near Wetherlees Hill and the disused reservoir.
- 5.7.92 46 Cetti's warbler territories were reported to be present within the ornithological study area in 2017, of which 16 were inside the RLB or within *circa* 50 m. It is considered this figure could represent an over-estimate as Cetti's warbler males are known to occupy large territories and move large distances (Bibby, 1982). Cetti's warbler was also recorded within the REP site in 2016 (Wilson, 2016a).
- 5.7.93 Other Schedule 1 species which are considered to have the potential to be present within the ornithological study area include hobby, barn owl and black redstart, although no evidence of breeding by these species was recorded during the 2017 survey. Due to the current absence of these species from the study area, these species are not considered in the assessment, although pre-construction surveys are proposed and appropriate mitigation measures for these species would be developed if necessary (see Table 5.11).
- 5.7.94 As stated in respect of Sandwich Bay to Hacklinge Marshes SSSI, 12 species forming part of the notified 'assemblage of breeding birds – lowland open waters and their margins' were recorded breeding within the ornithological survey area during the 2017 surveys. These were: mute swan, shelduck, mallard, water rail, moorhen, redshank, cuckoo, yellow wagtail, Cetti's warbler, reed warbler, sedge warbler and reed bunting.
- 5.7.95 13 additional species included on the BOCC red list (Eaton *et al.*, 2015), the Section 41 list of species of principal importance or subject to a Species Action Plan in Kent (Kent Biodiversity Partnership, 2018) were also recorded within the ornithological survey area. These included grey partridge, herring gull, turtle dove, skylark, dunnock, nightingale, song thrush, mistle thrush, starling, house sparrow, bullfinch, linnets and yellowhammer.
- 5.7.96 In their Section 42 response RSPB highlighted three of the species listed above as requiring particular consideration: cuckoo, turtle dove and nightingale. Breeding redshank was also highlighted as a particular concern in the Nemo Link ES. A total of 17 cuckoo territories were reported during the 2017 breeding bird survey. Five of the reported territories were either within the RLB or within *circa* 100 m. A total of eight turtle dove territories were located within the ornithological study area in 2017, with two of these within the RLB plus 100 m buffer, both in Stonelees Nature Reserve. Six nightingale territories were located within the RLB plus 100 m buffer with 13 recorded in total within the ornithological study area. Seven redshank territories were identified, all of which were recorded in the upper saltmarsh either to the north (2 territories) or south (5 territories) of Pegwell Bay Country Park.

Non-breeding Birds

- 5.7.97 Full details of non-breeding bird surveys undertaken in 2016-17, along with a summary of a number of existing sources of non-breeding bird data for the study area, are provided in Volume 5, Annex 5-4: Ornithology Baseline Report (Document Ref: 6.5.5.4). Information relating to non-breeding waterbirds forming qualifying or notified features for designated sites were summarised in the section on statutory designated sites above and details are not repeated here. A brief summary of findings for other key species is provided below.
- 5.7.98 Four species have been recorded in nationally important numbers in Pegwell Bay in recent years:
- Brent goose: foraging on the mudflats in Pegwell Bay, and loafing on the inshore waters at high tide, primarily from October to March;
 - Red-throated diver: flocks of birds foraging offshore in Pegwell Bay, primarily from December to February;
 - Great crested grebe: flocks of birds foraging offshore, primarily from December to March; and
 - Lapwing: flocks of roosting birds on the mudflats and adjacent saltmarsh, primarily from October to February.
- 5.7.99 Of these species brent goose and great crested grebe were not recorded within 250 m of the proposed landfall location during the winter surveys in 2016-17 whilst red-throated diver was recorded within 250 m of the landfall on one date only, with a peak count of ten (see Volume 5, Annex 5-13, Intertidal Waterfowl Data Analysis in Relation to Onshore Works, Document Ref: 6.5.5.13). Lapwing however was regularly recorded within 250 m of the landfall, with a peak count in this area of 503 in December 2016.
- 5.7.100 WeBS data (Volume 5, Annex 5-4 (Document Ref: 6.5.5.4), Table C2 in Appendix C), SBBO data and results from the 2016-17 surveys highlight a number of other species which are likely to be present in numbers of at least county importance at Pegwell Bay over the past five years. These include: but on a more infrequent basis: cormorant, little egret, bar-tailed godwit, Mediterranean gull, In addition, Pegwell Bay provides an important stop-over location for migrant waders, in particular, for, from July to September. For the remaining species of wildfowl, waders and gulls that occur regularly in the area, Pegwell Bay supports county important numbers of these species outside the breeding season (based on the peak counts at key sites in Kent, provided in Privett [ed] 2015, 2016), including:
- Wildfowl: shelduck, wigeon, teal, shoveler, mallard and common scoter;
 - Waders: oystercatcher, grey plover, knot, dunlin, curlew, redshank, whimbrel, greenshank and common sandpiper;

- Terns: Sandwich tern, common tern and little tern;
- Gulls: Great-black backed gull, herring gull, Mediterranean gull, black-headed gull and common gull; and
- Other waterbirds: little egret and cormorant.

5.7.101 Most of the above species are present in the highest numbers during winter (October to March), although peak numbers of some wader species occur in autumn while number of terns and some gull species are highest in late summer.

Mammals

Badger

5.7.102 The results of the badger survey are presented in Volume 5, Annex 5-8: Badger Survey Report (Document Ref: 6.5.5.8) and existing data obtained during the desk study is provided in Volume 5, Annex 5-1: Extended Phase 1 Habitat Survey (Document Ref: 6.5.5.1) (confidential appendix D).

5.7.103 No evidence of badger was recorded within the RLB or 50 m buffer during the survey and the closest existing record is located approximately 1 km from the RLB. Badger is therefore considered unlikely to be present within the study area. No evidence of badger has been recorded within the REP site (Aecom, 2016).

Bats

5.7.104 The desk study provided no records for bats within the RLB; records for common pipistrelle, soprano pipistrelle, Nathusius pipistrelle, noctule, whiskered, Daubenton's, Natterer's, brown long-eared and a horseshoe bat species were provided for the area within 5 km of the RLB (see Volume 5, Annex 5-1: Extended Phase 1 habitat survey, Document Ref: 6.5.5.1).

5.7.105 The results of bat surveys undertaken between August and November 2017 are presented in Volume 5, Annex 5-9: Bat Survey Report (Document Ref: 6.5.5.9) and the results of additional surveys in May 2018 are presented in Annex 5-12: Additional Bat Surveys (Document Ref: 6.5.5.12). A summary of key findings is provided below.

5.7.106 At least seven bat species were recorded during the surveys in August to October 2017 (identification of *Myotis* bats was not attempted, meaning more than one *Myotis* species may have been present) and six of these species (excluding Leisler's) were also recorded in May 2018. The species recorded were:

- Common pipistrelle;
- Soprano pipistrelle;
- Nathusius' pipistrelle;

- Noctule;
- Leisler's;
- Serotine; and
- *Myotis* species.

5.7.107 No roost sites were observed during the tree and building inspections or during the nocturnal roost surveys and no activity indicative of roosts was identified during the manual transect surveys. A small number of bat droppings were recorded at the Baypoint Sports Clubhouse, approximately 75 m from the RLB in March 2017 (Volume 5, Annex 5-1: Extended Phase 1 Habitat Survey Report, Document Ref: 6.5.5.1) but no evidence of bats was recorded during a full internal inspection in November 2017. A small number of trees which could potentially be affected by the proposed development were identified as having low potential to support bat roosts.

5.7.108 Common and soprano pipistrelle were by far the most commonly-recorded species during bat activity surveys with other species all recorded much less frequently. Nathusius' pipistrelle was rarely registered during the activity surveys in the autumn and although more were recorded during surveys in May 2018, the survey data indicate that individuals were likely to be commuting or briefly using habitats within the survey area for foraging activity before moving on. Leisler's and serotine were recorded very rarely with less than one pass per night recorded at any location.

5.7.109 Whilst caution should be applied when directly comparing levels of bat activity between recording locations owing to differences in the dates of recording at some locations, the data strongly indicate that the highest levels of bat activity were associated with the woodland edge and tree line along the northern and eastern edges of the Baypoint Sports Club site and southern end of Stonelees Nature Reserve. Activity levels in more open habitats within Pegwell Bay Country Park were generally much lower. The habitats at the southern end of the study area, including the British Car Auctions site, the proposed substation site and the tenant relocation area, were not surveyed but are dominated by hardstanding and are not considered likely to be of significant value to foraging and commuting bats, although occasional foraging along boundary tree lines is possible.

5.7.110 The REP site was not accessible for survey in 2017 or 2018 but was surveyed in 2016 (Greengage Ecology, 2016b). Activity surveys at the REP site recorded a similar range of species to those recorded during the 2017 surveys for Thanet Extension. It is understood that a bat barn is present in the northwest corner of the REP site (outside the RLB), which was built as mitigation for the loss of roosts in the old power station in 2011. No evidence of roosting bats was found in the bat barn in 2016, although surveys in 2015 (reported by Greengage Ecology, 2016b) recorded evidence of roosting bats in five out of 22 tree-mounted bat boxes erected at the same time. No habitats of potential value for bats were present within the parts of the REP site that could be affected by the proposed development in March 2018 (see Volume 5, Annex 5-10: Additional Phase 1 Habitat Survey, Document Ref: 6.5.5.10).

Water Vole and Otter

5.7.111 The results of water vole and otter surveys undertaken in 2017 are presented in Volume 5, Annex 5-2: Water Vole and Otter Survey Report (Document Ref: 6.5.5.2). A summary of key findings is provided below.

5.7.112 A total of 192 records of water vole were provided by the desk study; the majority of which were more than 2 km from the RLB. One record was provided from within the RLB, from the River Stour to the southwest of the REP site, but the record is over ten years old. Although not picked up by the desk study reported in Annex 5-2, water vole was recorded in 2014 along the ditch on the eastern side of Sandwich Road, adjacent to the RLB, where it runs alongside Stonelees Nature Reserve and the southern part of Pegwell Bay Country Park (WSP Parsons Brinckerhoff, 2016a). Water vole was also recorded here in 2005 (TEP, 2013) but not in 2011 when the ditch was dry. The ditch was also dry at the time of the surveys in 2017, although it was wet in March 2018.

5.7.113 No signs of water vole were recorded within or immediately adjacent to the RLB during the surveys in 2017 and there are just two features with potential to support water vole within or adjacent to the RLB. These are the ditch adjacent to Sandwich Road (see above) and the Minster Stream within the British Car Auctions site, although no evidence of water vole was recorded here in 2017. Beyond the RLB, to the west and north-west of Sandwich Road, water vole were recorded within the network of drainage ditches within the golf courses. Signs of water vole were also recorded in ditches to the southwest of the REP site, on the far side of the River Stour.

5.7.114 One record of otter was provided by the desk study, 2.8 km to the southwest of the RLB, in 2016. During the otter surveys, no signs of otter were recorded within the RLB or within a 200 m buffer. The sections of the River Stour (immediately to the east of the RLB and immediately southwest of the REP site) have features with the potential to support otter and a possible otter holt was recorded to the southwest of the REP site in 2016 (Greengage Ecology, 2017a), although no confirmed evidence of otter was found.

5.7.115 One record of beaver was returned by the desk study 1.75 km to the north-east of the RLB. No field signs of beaver were noted during the surveys.

Predicted Future Baseline

5.7.116 In the absence of development and in the absence of knowledge regarding any significant changes to the current management regimes it is assumed that the habitats present within and adjacent to the RLB will remain broadly similar to those present now. Assuming current management continues, gradual changes that might be expected would include an increase in scrub and a corresponding decrease in grassland habitats across Pegwell Bay Country Park and parts of Stonelees Nature Reserve. Areas of ephemeral/short perennial vegetation within the proposed substation site and tenant relocation area are also likely to gradually be succeeded by rank grassland and scrub.

5.7.117 Faunal species populations are likely to change in response to habitat changes and other factors, for example increases in the population of American mink may lead to a decline in the local water vole population. Such changes are difficult to predict and assuming current management continues, most changes are not likely to be significant in the short to medium term. To allow for possible changes in the distribution of protected faunal species pre-construction surveys for natterjack toad, badger, otter, water vole and Schedule 1 bird species would be undertaken to ensure legislative compliance during construction, as detailed in section 5.9.

5.7.118 Some species populations are also likely to change in response to external factors such as climate change. Recent collaborative work by Durham University, the BTO and RSPB predict substantial changes in species ranges during the coming decades with an average shift north of 4 km per year and contraction of range and species richness (Huntley *et al.*, 2007). Survey work represents a snapshot of the bird community at the time of the survey and cannot be extrapolated to predict future population trends in the wake of such external factors.

5.7.119 Planning consent has been granted for the replacement of the wind turbine to the west of the REP site. Prior to construction of the new turbine the peregrine falcon nest box, which is located in close proximity to the turbine location, will be moved to a new location to the west, further away from the turbine. The new location will be over 700 m from the RLB.

Evaluation of Receptors

Designated Sites

5.7.120 As set out in section 5.5, for designated sites and their qualifying or notified features, importance reflects the geographical context of the designation. SPAs, SACs and Ramsar sites are therefore all considered to be internationally important. SSSIs and NNRs are considered nationally important and LWSs and KWTRs are considered important at a county (Kent) level. LNRs and Roadside Nature Reserves are considered important at district (Thanet/ Dover) level.

Habitats

5.7.121 An evaluation of the importance of the habitats present within the study area is provided in Table 5.8. Table 5.8 also includes information regarding the conservation status of each habitat type and justification for the evaluation given.

Table 5.8: Evaluation of Habitats within the Study Area

Phase 1 Habitat Type	Conservation Status	Reason for Evaluation	Level of Importance
Broad-leaved woodland – semi-natural	Section 41 - lowland mixed deciduous woodland Kent HAP - native woodland	Although native woodland is a conservation priority, woodland within the study area is relatively small in extent (3.96 ha), semi-mature and some areas are likely to have been planted (despite being mapped as semi-natural in the Phase 1 habitat survey), e.g. the triangular area in the southwest of Pegwell Bay Country Park which is dominated by the non-native white poplar. It is therefore unlikely to meet the criteria for Section 41 priority habitat status or Kent priority status.	Local
Broad-leaved woodland – plantation	Section 41 - lowland mixed deciduous woodland	The strip of trees forming the northern boundary of the Baypoint Sports Club site is planted and contains non-native species (e.g.	Local

Phase 1 Habitat Type	Conservation Status	Reason for Evaluation	Level of Importance
	Kent HAP - native woodland	Lombardy poplar).	
Dense/continuous scrub	n/a	Although scrub is not a priority habitat in its own right it provides habitat for a range of faunal species, e.g. breeding birds.	Local
Scattered scrub	n/a	Although scrub is not a priority habitat in its own right it provides habitat for a range of faunal species, e.g. breeding birds.	Local
Parkland and scattered trees – broad-leaved	n/a	Scattered broad-leaved trees are mostly semi-mature and include a number of non-native species, e.g. white poplar and Lombardy poplar. No veteran trees were identified within the study area.	Local
Parkland and scattered trees - coniferous	n/a	A small number of coniferous trees are present in the 50 m buffer, to the west of Sandwich Road.	Local
Neutral grassland – semi-improved	Section 41 – lowland meadow Kent HAP – lowland meadow Section 41 – coastal and floodplain	Semi-improved neutral grassland throughout Pegwell Bay Country Park and Stonelees Nature Reserve does not meet the definition of lowland meadow (BRIG, 2011; Kent Biodiversity Partnership, 2018), which relates to unimproved, species-rich grasslands subject to grazing or managed for hay. Semi-improved neutral grassland in the 50 m buffer to the southwest of	Local District (areas of semi-improved grazing marsh pasture in the buffer zone)

Phase 1 Habitat Type	Conservation Status	Reason for Evaluation	Level of Importance
	grazing marsh Kent HAP – coastal and floodplain grazing marsh	the REP site and within the SSSI to the east of the River Stour was mapped as semi-improved grazing marsh pasture in the 2012 Kent Habitat Survey. Kent supports a total of 6,900 ha of grazing marsh (Kent Biodiversity Partnership, 2018). The extent within the study area is relatively small (12.5 ha) and therefore not considered to be of county-level importance but is important at a district level.	
Improved grassland	n/a	Improved grassland is a very common and widespread habitat type of low conservation value.	Local
Tall ruderal	n/a	Tall ruderal is a very common and widespread habitat type of low conservation value.	Local
Non-ruderal	n/a	Non ruderal is a common and widespread habitat type of low conservation value.	Local
Standing water	Section 41 – ponds Kent HAP – standing open water	The small ephemeral pools within Stonelees Nature Reserve may meet the UK BAP definition of ponds (BRIG, 2011) as they have previously supported natterjack toad, although natterjack is no longer present which reduces their value. No other ponds within the survey area meet the BRIG (2011) definition. Wet ditches within the 50 m buffer zone may meet the Kent HAP	District

Phase 1 Habitat Type	Conservation Status	Reason for Evaluation	Level of Importance
		definition of standing open water, although their extent is limited. Ecological receptors within intertidal areas (excluding birds) are covered in Volume 2, Chapter 5: Subtidal and Intertidal Benthic Ecology (Document Ref: 6.2.5).	
Running water	Section 41 – rivers	The UK BAP definition of rivers includes rivers which are near natural or fulfil one or more specific criteria relating to BAP priority species or habitat types. Lower parts of rivers within the freshwater tidal zone may be included. The River Stour to the southwest of the REP site is likely to meet the UK BAP definition and as one of relatively few major rivers in Kent is considered to be of county importance. Ecological receptors within intertidal areas (excluding birds) are covered in Volume 2, Chapter 5: Subtidal and Intertidal Benthic Ecology (Document Ref: 6.2.5).	County
Intertidal mud/sand	Section 41 – intertidal mudflats Kent HAP – mudflats Lower Stour BOA target habitat	Ecological receptors within intertidal areas (excluding birds but including intertidal mud/ sand) are covered in Volume 2, Chapter 5: Subtidal and Intertidal Benthic Ecology (Document Ref: 6.2.5).	n/a

Phase 1 Habitat Type	Conservation Status	Reason for Evaluation	Level of Importance
Saltmarsh – dense/continuous	Section 41 – coastal saltmarsh Lower Stour BOA target habitat	Ecological receptors within intertidal areas (excluding birds but including saltmarsh) are covered in Volume 2, Chapter 5: Subtidal and Intertidal Benthic Ecology (Document Ref: 6.2.5).	n/a
Amenity grassland	n/a	Amenity grassland is a very common and widespread habitat type of low conservation value.	Local
Ephemeral/short perennial	Section 41 – open mosaic habitats on previously developed land Kent HAP – built-up areas and gardens	Ephemeral/short perennial habitat in the eastern part of the proposed substation site and tenant relocation areas meets the BRIG (2011) criteria for this priority habitat type. Spatial and topographical variation is limited and succession to scrub has already begun in places and is likely to continue without management, which will reduce the value of this area.	District
Dry ditch	n/a	Dry ditches are a common and widespread habitat type of low conservation value.	Local
Buildings	n/a	The buildings within the RLB have low conservation value.	Local
Bare ground/hardstanding	n/a	Hardstanding is of low conservation value.	Local

Faunal Species

5.7.122 An evaluation of the importance of the faunal species which are either known to be present or considered likely to be present within the relevant study areas is provided in Table 5.9. Table 5.9 also includes information regarding the conservation and legal status of each species and justification for the evaluation given. For simplicity some receptors have been grouped for the purposes of evaluation.

Table 5.9: Evaluation of Faunal Receptors

Receptor	Conservation/ Legal Status	Reason for Evaluation	Level of Importance
Terrestrial invertebrates – Thanet Coast and Sandwich Bay Ramsar wetland invertebrate assemblage species	RDB 3 species (rare) Qualifying feature for Ramsar	Three species forming part of the Ramsar wetland invertebrate assemblage could potentially be present within the RLB.	International (if present)
Terrestrial invertebrates – Sandwich Bay to Hacklinge Marshes invertebrate assemblage species	Various categories of nationally rare and scarce Qualifying feature for SSSI	21 species forming part of the SSSI invertebrate assemblage could potentially be present within the RLB.	National (if present)
Terrestrial invertebrates – other species (outside SSSI/ Ramsar)	Various categories of nationally rare and scarce	Pegwell Bay Country Park was assessed to be of local or potentially district significance for invertebrates based on consideration of the conservation status of species recorded or likely to be present and a broader assessment of the potential of the habitats present to support invertebrate assemblages of potential value (see Volume 5, Annex 5-6: Terrestrial Invertebrate Assessment	Local to County

Receptor	Conservation/ Legal Status	Reason for Evaluation	Level of Importance
		<p>(Document Ref: 6.5.5.6) for further details).</p> <p>The open mosaic habitats in the proposed substation site and tenant relocation area are likely to support a number of rare or scarce species, although the lack of topographic diversity and high level of exposure is likely to limit the number of species present. The invertebrate assemblage is therefore considered unlikely to be exceptional but in the absence of survey data a precautionary approach has been taken which assumes the assemblage could be of county value.</p> <p>The REP site was formerly regarded as being nationally important for invertebrates but in March 2018 no potentially valuable habitats were present within the RLB.</p>	
Reptiles (slow-worm and viviparous lizard)	<p>Schedule 5 of the Wildlife & Countryside Act 1981 (as amended) – protected in respect of killing, injuring and sale or offering for sale only.</p> <p>Section 41 – both species</p> <p>Kent BAP – both</p>	<p>Surveys indicated a good population of viviparous lizard in Pegwell Bay Country Park and Baypoint Sports Club. A low population of slow-worm was recorded in Pegwell Bay Country Park and low populations of viviparous lizard were recorded in Stonelees Nature Reserve and at the proposed substation site. The proposed tenant relocation area is also likely to support a low</p>	<p>District (viviparous lizard)</p> <p>Local (slow-worm)</p>

Receptor	Conservation/ Legal Status	Reason for Evaluation	Level of Importance
	species	population of viviparous lizard.	
Breeding birds – Schedule 1 species (peregrine falcon, marsh harrier, kingfisher and Cetti’s warbler)	<p>Schedule 1 of the Wildlife & Countryside Act 1981 (as amended)</p> <p>Annex 1 of the EC Birds Directive (peregrine falcon and marsh harrier)</p>	<p>2 pairs of peregrine falcon represents between 5-6.6% of the Kent population of 30-40 pairs (Clements <i>et al.</i>, 2015).</p> <p>1 pair of marsh harrier represents between 1-1.3% of the Kent population of 80-100 pairs (Clements <i>et al.</i>, 2015).</p> <p>1 pair of kingfisher represents between 1-1.3% of the Kent population of 75-100 pairs (Clements <i>et al.</i>, 2015).</p> <p>46 pairs of Cetti’s warbler (if correct) would represent 2.3% of the UK population based on Musgrove <i>et al.</i> (2013), although more recent estimates (Pitches, 2018) indicate that 46 pairs would represent less than 1.5% of the UK population, which is now more than 3,000 pairs. Given the uncertainty over the size of the study area population and the continuing growth in the UK population of this species the population within the study area is probably best considered to be of county importance.</p>	County
Breeding birds - Sandwich Bay to Hacklinge Marshes lowland open	<p>Section 41 – cuckoo, yellow wagtail and reed bunting</p> <p>BOCC red list – cuckoo</p>	12 species forming part of the SSSI assemblage were recorded breeding within the study area in 2017.	National

Receptor	Conservation/ Legal Status	Reason for Evaluation	Level of Importance
waters and their margins assemblage species	and yellow wagtail Kent BAP - cuckoo and yellow wagtail Notified feature for SSSI All wild birds subject to protection under Section 1 of the Wildlife & Countryside Act 1981 (as amended)		
Breeding birds – turtle dove and nightingale	Section 41 – turtle dove BOCC red list – turtle dove and nightingale Kent BAP – turtle dove All wild birds subject to protection under Section 1 of the Wildlife & Countryside Act 1981 (as amended)	Eight turtle dove territories represents 0.27-0.4% of the Kent population of 2000-3000 pairs (Clements <i>et al.</i> , 2015). 13 nightingale territories represents 0.8-0.9% of the Kent population of 1,450-1,550 pairs (Clements <i>et al.</i> , 2015). Both species are therefore below the level required to be of county importance.	District
Breeding birds – other species of conservation concern	Section 41 – several species BOCC red list – several species Kent BAP – several species	A number of Birds of Conservation Concern were recorded breeding within the ornithological study area, although most species not already covered above are still relatively common and widespread. Populations are therefore unlikely to be of more	Local - District

Receptor	Conservation/ Legal Status	Reason for Evaluation	Level of Importance
	All wild birds subject to protection under Section 1 of the Wildlife & Countryside Act 1981 (as amended)	than local or perhaps district importance.	
Non-breeding birds – Thanet Coast and Sandwich Bay SPA/ Ramsar qualifying species	Annex 1 of the EC Birds Directive – European golden plover Qualifying feature for SPA (European golden plover and ruddy turnstone) Qualifying feature for Ramsar (ruddy turnstone)	Although both species have declined since the time of classification and European golden plover is recommended for removal as a qualifying feature by the second SPA review (Stroud <i>et al.</i> , 2001) both species currently still represent qualifying features.	International
Non-breeding birds - Sandwich Bay to Hacklinge Marshes notified species	Annex 1 of the EC Birds Directive – European golden plover BOCC red list – ringed plover Notified feature for SSSI	Although none of these species have been regularly present in nationally important numbers in the last few years they are all notified features for the SSSI.	National
Non-breeding birds – lapwing	Section 41 BOCC red list Kent BAP	Numbers of lapwing recorded in Pegwell Bay exceed the threshold for national importance.	National

Receptor	Conservation/ Legal Status	Reason for Evaluation	Level of Importance
Non-breeding birds – other waterbird species	Annex 1 of the EC Birds Directive – various species Section 41 – various species BOCC red list – various species Kent BAP – various species	See paragraph 5.7.100	County
Bats	Schedule 2 of the Habitats Regulations – all species Schedule 5 of the Wildlife & Countryside Act 1981 (as amended) – all species Section 41/ Kent BAP – noctule and soprano pipistrelle	No roosts recorded within or directly adjacent to the RLB. At least seven bat species recorded during activity surveys. Activity of most species was relatively low, although common and soprano pipistrelle were recorded in reasonable numbers in some places.	Local - District
Water vole	Schedule 5 of the Wildlife & Countryside Act 1981 (as amended) Section 41/ Kent BAP	Recorded in several locations within the wider study area, but not within the RLB itself (although water vole was present along the eastern side of Sandwich Road in 2014).	District
Otter	Schedule 2 of the Habitats Regulations Schedule 5 of the	There are no confirmed records within the study area, although there is one possible record from	Local

Receptor	Conservation/ Legal Status	Reason for Evaluation	Level of Importance
	Wildlife & Countryside Act 1981 (as amended) Section 41/ Kent BAP	2016 and suitable habitat is present.	

Receptors Subject to Detailed Assessment

5.7.123 As set out in section 5.5, all receptors of at least district value and all legally protected or controlled species, which could potentially be affected by the proposed development are subject to detailed assessment. On this basis of the evaluation presented in Table 5.8 and Table 5.9, the following receptors are therefore subject to detailed assessment in this chapter.

Designated Sites

- Thanet Coast and Sandwich Bay SPA – non-breeding European golden plover and ruddy turnstone;
- Thanet Coast and Sandwich Bay Ramsar – wetland invertebrate assemblage and non-breeding ruddy turnstone;
- Sandwich Bay and Hacklinge Marshes SSSI – aggregations of non-breeding birds, assemblage of breeding birds and invertebrate assemblage;
- Sandwich and Pegwell Bay NNR;
- Ash Level and South Richborough Pasture LWS;
- A256 (Sandwich Road) Roadside Nature Reserve; and
- Sandwich and Pegwell Bay KWTR.

Habitats/ Vegetation

- Semi-improved neutral grassland – areas of semi-improved grazing marsh pasture in the buffer zone to the east and southwest of the RLB;
- Standing water – ephemeral pools in Stonelees Nature Reserve;
- Running water – River Stour;
- Ephemeral/ short perennial habitats within the proposed substation site and tenant relocation area; and

- Invasive non-native plant species.

Faunal Species (where not included as qualifying or notified features for designated sites)

- Terrestrial invertebrates – outside designated sites;
- Reptiles – slow-worm and viviparous lizard;
- Breeding birds – Schedule 1 species;
- Breeding birds – turtle dove and nightingale;
- Breeding birds – other species of conservation concern;
- Breeding birds – all species (in respect of destruction of or damage to active nests only);
- Non-breeding birds – lapwing;
- Non-breeding birds – other waterbird species;
- Bats;
- Water vole; and
- Otter.

Receptors Scoped Out

5.7.124 As agreed during Section 42 consultation and the EP process, the following designated sites, or qualifying/ notified features for designated sites, have been scoped out as there is no potential for significant effects upon them:

- Thanet Coast and Sandwich Bay SPA (breeding little tern) – little tern no longer breeds within the SPA and therefore there is no potential for significant effects;
- Sandwich Bay to Hacklinge Marshes SSSI (lowland ditch systems, bright wave moth, lizard orchid, bedstraw broomrape, reedbed, sand dune and saltmarsh habitats, vascular plant assessmblage) – effects on saltmarsh habitats are covered in Volume 2, Chapter 5: Subtidal and Intertidal Benthic Ecology (Document Ref: 6.2.5), the other features are not present within the study area and are not likely to be subject to significant effects;
- Sandwich Bay SAC – the project design has avoided the Sandwich Bay SAC onshore boundary and therefore there is no potential for significant effects on the qualifying features;
- Thanet Coast SAC – the qualifying features for Thanet Coast SAC are marine and are therefore not assessed here but are covered in Volume 2, Chapter 5: Subtidal and Intertidal Benthic Ecology (Document Ref: 6.2.5);

- Stodmarsh SPA – Stodmarsh is located 9.35 km from the RLB and there is no evidence of a functional link between the area within the RLB and the SPA for any of the qualifying features;
 - Stodmarsh Ramsar – Stodmarsh is located 9.35 km from the RLB and there is no evidence of a functional link between the area within the RLB and the SPA for any of the qualifying features;
 - Prince’s Beachlands Local Nature Reserve (LNR) – Prince’s Beachlands is located 1.38 km from the RLB with no direct hydrological connection (other than the sea) and there is no potential for significant effects on the interest features; and
 - Woods and Grassland Minster LWS – the LWS is located 0.58 km from the RLB and although potentially hydrologically linked is located upstream of the RLB therefore the potential for pollution effects is negligible.
- 5.7.125 Effects on intertidal habitats, e.g. saltmarsh, intertidal mudflats and brackish pools and their associated fauna (excluding birds) are not assessed here but are covered in Volume 2, Chapter 5: Subtidal and Intertidal Benthic Ecology (Document Ref: 6.2.5).

5.8 Key Parameters for Assessment

- 5.8.1 The project description for onshore aspects of the projects is presented in Volume 3, Chapter 1: Project Description (Onshore) (Document Ref: 6.3.1). Offshore aspects of the project, which are relevant here in respect to birds using intertidal areas, are presented in Volume 2, Chapter 1: Project Description (Offshore) (Document Ref: 6.2.1).
- 5.8.2 For a number of aspects of the project, a range of options are available, particularly during the construction phase. To understand the potential for impact, and in line with the Planning Inspectorate Advice Note Nine: Rochdale Envelope (Planning Inspectorate, 2012), the project elements that represent the maximum adverse scenario for onshore biodiversity (the ‘Rochdale Envelope’) have been identified in Table 5.10.

Table 5.10: Maximum design scenario assessed

Potential effect	Maximum design scenario assessed	Justification
Construction		
Permanent habitat loss (terrestrial)	<p>A total of approximately 2.4 ha of ephemeral/ short perennial habitat could be permanently lost during construction of the substation.</p> <p>In addition a small area of approximately 0.06 ha comprising amenity grassland and a small number of semi-mature trees will be lost to facilitate the construction of a new permanent access into the Baypoint Sports Club site.</p>	<p>This figure assumes that all habitat within the substation site will be lost during construction, although in practice some of the habitat lost will be restored within the substation compound following construction (see Section 5.9). It also assumes that all habitat within the associated construction and laydown area will be permanently lost, although in practice some of this habitat may re-establish following construction works.</p> <p>All other terrestrial habitats affected during construction will be reinstated or restored and are therefore covered under temporary habitat loss/ disturbance.</p>
Permanent habitat loss (intertidal)	<p>Option 2 for the proposed landfall works (locating the Transition Joint Bays (TJBs) above ground within the Country Park) could involve extending the existing sea defence within the saltmarsh by up to 18.5 m over a length of up to 155 m. The total maximum area of permanent habitat loss as part of the landfall works is 1,399 m² of saltmarsh habitat.</p> <p>The permanent loss of saltmarsh habitat is covered in Volume 2, Chapter 5: Subtidal and Intertidal Benthic Ecology (Document Ref: 6.2.5) and is only assessed here with respect to indirect effects on birds.</p>	<p>Options 1 and 3 for the proposed landfall works (locating the TJBs below ground within the Country Park and installation of the offshore cables by Horizontal Directional Drilling (HDD) or trenching respectively) would involve no permanent loss of saltmarsh habitat. Option 2 therefore represents the maximum design scenario assessed.</p> <p>Note that options 1 and 3 are dependent on Site Investigation works indicating that trenching and/or HDD are possible within the historic landfill.</p>

Potential effect	Maximum design scenario assessed	Justification
<p>Temporary habitat loss/ disturbance (terrestrial)</p>	<p>The maximum areas affected by temporary habitat loss/ disturbance are as follows:</p> <p>TJBs (option 1 – installation of the offshore cables by HDD): 3,000 m²;</p> <p>Temporary access track to landfall: 1,750 m² (350 x 5 m);</p> <p>Onshore cable route – Pegwell Bay Country Park (option 2 – above ground cable installation): 24,650 m² (725 x 34 m);</p> <p>Onshore cable route – Stonelees Nature Reserve: 10,500 m² (350 x 30 m);</p> <p>Onshore cable route – Baypoint Sports Club site: 13,500 m² (450 x 30 m);</p> <p>Onshore cable route – British Car Auctions site: 9,000 m² (300 x 30 m); and</p> <p>Construction and laydown areas (cable route only – substation included under permanent loss): 9,320 m² at Pegwell Bay Country Park, plus 1,415 m² for the creation of additional temporary access and 1,800 m² at the Baypoint Sports Club site.</p> <p>Terrestrial habitats including scrub, broad-leaved woodland, scattered trees, semi-improved neutral grassland, amenity grassland, hardstanding and ephemeral/ short perennial communities may be temporarily lost/ disturbed during construction works. In addition at least one small, ephemeral water body may be lost within Stonelees Nature Reserve.</p> <p>All of the semi-natural habitats affected will either be reinstated or restored (if cabling is installed within a berm in the country park) – see Table 5.11 and the OLEMP (Document Ref: 8.7). Any water bodies lost will be replaced.</p>	<p>The maximum areas affected are taken from Volume 3, Chapter 1: Project Description (Onshore) (Document Ref: 6.3.1). Where different construction options would result in differences in the area affected the worst-case option is used.</p> <p>The maximum areas of each habitat affected are based on the assumption that the maximum extent of each habitat type within the relevant section of the RLB could be affected.</p>
<p>Temporary habitat loss/ disturbance (intertidal)</p>	<p>Four cable trenches will be installed across the intertidal, between Mean Low Water Spring and the edge of the saltmarsh. Trench width will be up to 10 m wide (28 m including spoil, based on a 30 degree slope), with burial up to 3 m below the seabed. The maximum intertidal habitat disturbed during construction will be 80,000 m².</p> <p>Four trenches will be installed through the saltmarsh. Trenches will be 1 m wide, with 5 m either side to be used for vehicle movement and spoil. This will result in a maximum working area of up to 35 m through the saltmarsh for a length of ~ 50 m. Under options 2 and 3 for the landfall a cofferdam will be required. This would be up to 165 m long by 25 m wide (4,125 m²). The maximum extent of saltmarsh disturbed during construction, from trenching and the cofferdam, will be 5,875 m².</p> <p>The temporary loss/ disturbance of intertidal habitats is covered in Volume 2, Chapter 5: Subtidal and Intertidal Benthic Ecology (Document Ref: 6.2.5) and is only assessed here with respect to indirect effects on birds.</p>	<p>Option 1 for the proposed landfall works (locating the TJBs below ground within the Country Park and installation of the offshore cables by HDD) would involve no temporary loss or disturbance of saltmarsh habitat. Options 2 and 3 therefore represent the maximum design scenario assessed.</p> <p>Note that option 1 is dependent on Site Investigation works indicating that HDD is possible within the historic landfill.</p>

Potential effect	Maximum design scenario assessed	Justification
Accidental killing or injuring of faunal species	<p>In the absence of mitigation, there is potential for construction works to result in the accidental killing or injuring of faunal species.</p> <p>The maximum area over which such effects are possible is outlined above with respect to permanent and temporary habitat loss/ disturbance. The maximum duration over which such effects are possible is as follows:</p> <p>Landfall: 5 months construction period;</p> <p>Cabling: up to 18 months construction period (excluding cable pulling); and</p> <p>Substation: up to 24 months.</p> <p>The total duration of the construction period may be up to a maximum of 30 months, although there may be gaps in the construction programme where no works are undertaken.</p>	<p>Justification for the maximum spatial extent affected is provided above.</p> <p>The construction programme is taken from Volume 3, Chapter 1: Project Description (Onshore) (Document Ref: 6.3.1) and represents a worst-case.</p>
Disturbance to faunal species (noise/ vibration, visual, lighting)	<p>The construction programme is outlined above with respect to accidental killing and injuring.</p> <p>Noise and vibration: maximum construction noise levels are set out in Volume 3, Chapter 1, Project Description (Document Ref: 6.3.1), Table 1.10. It is assumed that percussive piling may be required during installation of the landfall coffer dam, if either Options 2 or 3 for the landfall are adopted. This would generate noise levels of up to 132dB, which would be irregular in character and could last for a period of 16 days. Noise generated by other construction activities would be more regular in character.</p> <p>Visual: it is assumed that visual disturbance is possible at any time when construction works are taking place, where there is a direct line of sight between the source of disturbance and the relevant receptor.</p> <p>Lighting: most works would only take place between the hours of 07.00 and 19.00. Lighting would be restricted to lighting of working areas whilst works were taking place and there would be no requirement for lighting overnight, except for security lighting at the substation. 24-hour working may be required for HDD and for some works at the substation, e.g. during commissioning.</p> <p>Construction of the TJBs could take place anywhere within the RLB from immediately inland of the landfall to a distance of 350 m inland. Construction immediately inland of the landfall is assessed.</p>	<p>Information regarding noise and vibration, lighting and the construction programme is taken from Volume 3, Chapter 1: Project Description (Onshore) (Document Ref: 6.3.1).</p> <p>The use of percussive piling at the landfall is assessed as a worst-case in respect of noise.</p> <p>The assumption that the TJBs will be located close to the landfall represents a worst-case in relation to potential disturbance to birds using intertidal habitats.</p>
Pollution (air quality)	<p>Dust arising from construction activities and associated movements of traffic could affect sensitive habitats within 200 m of the RLB (or the route(s) used by construction vehicles on the public highway up to 500 m from the site entrances).</p> <p>Deposition of airborne pollutants generated by construction traffic, notably NO_x but also nitrogen and acid could affect sensitive habitats and have therefore been assessed.</p>	<p>The approach to the dust assessment is in accordance with IAQM (2014) guidance and the approach to deposition of airborne pollutants from construction traffic is in accordance with the DMRB (see Volume 3, Chapter 9: Air Quality (Document Ref: 6.3.9) for details).</p> <p>Traffic figures are taken from Volume 3, Chapter 1: Project Description (Onshore) (Document Ref: 6.3.1).</p>

Potential effect	Maximum design scenario assessed	Justification
Pollution (water environment)	<p>In the absence of mitigation, works at the landfall under options 2 and 3 could create pathways for the migration of potential contaminants from the landfill into intertidal habitats.</p> <p>In the absence of mitigation, other construction works could also result in pollution of water-based resources, although these will be minimised by the adoption of standard pollution prevention measures (see section 5.9).</p> <p>Pollution of intertidal habitats is covered in Volume 2, Chapter 5: Subtidal and Intertidal Benthic Ecology (Document Ref: 6.3.5) and is only assessed here with respect to indirect effects on birds.</p>	<p>Options 2 and 3 for the landfall works have been assessed as they represent a worst-case. Option 1 (HDD) would result in a much lower risk of accidental pollution to intertidal habitats.</p> <p>Note that option 1 is dependent on Site Investigation works indicating that HDD is possible within the historic landfill.</p>
O&M		
Temporary habitat loss/ disturbance (terrestrial)	<p>Planned maintenance onshore is likely to be restricted to weekly visits to the substation, up to eight checks of joint pits per year and annual checks of TJBs, all of which will take place for the lifetime of the wind farm (40 years). These checks would involve the use of up to two people and a light vehicle only, with up to two HGV visits to the substation also required each month.</p> <p>The extent or nature of any unplanned corrective maintenance required can't be predicted at this stage as it is by its nature unplanned, and therefore possible effects in terms of temporary habitat loss/ disturbance can't be assessed. Any unplanned corrective maintenance required would be subject to any necessary consents and consultation with the relevant nature conservation bodies.</p>	<p>Information regarding the likely extent of planned maintenance works is taken from Volume 3, Chapter 1: Project Description (Onshore) (Document Ref: 6.3.1).</p> <p>The extent or nature of any corrective maintenance required can't be predicted at this stage.</p>
Temporary habitat loss/ disturbance (intertidal)	<p>Planned maintenance in the intertidal zone will include periodic preventative maintenance work, including geophysical investigations. The most likely scenario is that there would be planned yearly inspections of all cables within the intertidal, combined with 'unscheduled' inspections following extreme events (e.g. large storm events). The inspections are likely to comprise two or three persons accessing the intertidal on foot or small four wheel drive vehicle (use of low pressure vehicles such as an ARGO Cat or the use of hovercraft will also be considered) for a duration of approximately two to three weeks.</p> <p>The extent or nature of any unplanned corrective maintenance required can't be predicted at this stage and therefore possible effects in terms of temporary habitat loss/ disturbance can't be assessed. Any unplanned corrective maintenance required would be subject to any necessary consents and consultation with the relevant nature conservation bodies.</p>	<p>Information regarding the likely extent of planned maintenance works is taken from Volume 2, Chapter 1: Project Description (Offshore) (Document Ref: 6.2.1).</p> <p>The extent or nature of any corrective maintenance required can't be predicted at this stage.</p>

Potential effect	Maximum design scenario assessed	Justification
Disturbance (noise/ vibration, visual, lighting) (terrestrial)	<p>During normal operation noise will only be generated by the substation, at a level of 90 dB, which will be regular in character. There will be no lighting or visual disturbance during normal operation.</p> <p>The extent of planned maintenance activities was set out above in relation to temporary habitat loss/ disturbance.</p> <p>The extent or nature of any unplanned corrective maintenance required can't be predicted at this stage and therefore possible effects in terms of disturbance can't be assessed. Any unplanned corrective maintenance required would be subject to any necessary consents and consultation with the relevant nature conservation bodies.</p>	<p>Information regarding the likely extent of planned maintenance works is taken from Volume 3, Chapter 1: Project Description (Onshore) (Document Ref: 6.3.1).</p> <p>The extent or nature of any unplanned corrective maintenance required can't be predicted at this stage.</p>
Disturbance (noise/ vibration, visual, lighting) (intertidal)	<p>The extent of planned maintenance activities was set out above in relation to temporary habitat loss/ disturbance.</p> <p>The extent or nature of any unplanned corrective maintenance required can't be predicted at this stage and therefore possible effects in terms of disturbance can't be assessed. Any unplanned corrective maintenance required would be subject to any necessary consents and consultation with the relevant nature conservation bodies.</p>	<p>Information regarding the likely extent of planned maintenance works is taken from Volume 2, Chapter 1: Project Description (Offshore) (Document Ref: 6.2.1).</p> <p>The extent or nature of any unplanned corrective maintenance required can't be predicted at this stage.</p>
Pollution (water environment)	<p>In the absence of mitigation, planned O&M works could result in pollution of water-based resources, although these will be minimised by the adoption of standard pollution prevention measures (see section 5.9).</p> <p>The extent or nature of any unplanned corrective maintenance required can't be predicted at this stage and therefore possible effects in terms of accidental pollution can't be assessed. Any unplanned corrective maintenance required would be subject to any necessary consents and consultation with the relevant nature conservation bodies.</p>	<p>Information regarding the likely extent of planned maintenance works is taken from Volume 3, Chapter 1: Project Description (Onshore) (Document Ref: 6.3.1).</p> <p>The extent or nature of any unplanned corrective maintenance required can't be predicted at this stage.</p>
Decommissioning		
Impacts from decommissioning are expected to be similar to those for construction but over a reduced timescale and affecting a smaller area since the assets are already <i>in situ</i> . Any final decommissioning methodology would adhere to industry good practice, rules and regulations at the time of decommissioning.		
Cumulative effects (All phases)		
Addressed in section 5.13: Cumulative Effects		

5.8.3 Potential effects on ecological receptors resulting from airborne pollution (dust and airborne emissions from development-related traffic) during O&M have been scoped out as they are not likely to be significant. This approach is in line with the approach adopted in the air quality assessment (Volume 3, Chapter 9: Air Quality, Document Ref: 6.3.9).

5.9 Embedded Mitigation

5.9.1 Mitigation measures have been incorporated into the project to avoid and mitigate for potential impacts wherever possible. These measures are referred to as ‘embedded mitigation’ and include avoidance, i.e. where an impact has been avoided e.g. through changes in scheme design, and mitigation, i.e. measures to reduce or remedy a specific negative impact *in situ*.

5.9.2 Embedded mitigation measures relating to onshore biodiversity are set out in Table 5.11.

5.9.3 and the assessment of impacts has been undertaken on the basis that these measures will all be implemented.

5.9.4 Further details of embedded mitigation measures relating to onshore biodiversity are provided in the OLEMP (Document Ref: 8.7). The OLEMP sets out the principles of proposed landscape and ecological mitigation onshore and is intended as a precursor to a more detailed LEMP, which would be produced post consent. The production, agreement and implementation of the detailed LEMP, which will be developed in accordance with the measures set out in the OLEMP, form the subject of a DCO Requirement (Document Ref: 3.1). The OLEMP also includes initial proposals for biodiversity enhancements, as required under relevant planning policy, which will be developed further in consultation with relevant stakeholders and details provided within the detailed LEMP. Further details of other environmental mitigation measures relevant to onshore biodiversity, e.g. mitigation for invasive non-native species, dust and accidental pollution are provided in the CoCP (Document ref: 8.1).

5.9.5 Further details of mitigation measures relating to the intertidal environment are provided in Volume 2, Chapter 5: Subtidal and Benthic Ecology (Document Ref: 6.2.5) and in the Saltmarsh Mitigation, Reinstatement and Monitoring Plan (SMRMP) (Document Ref: 8.13). Further details will be provided post consent within a Project Environmental Management Plan (PEMP), the production and agreement of which form the subject of a DCO Requirement (Document Ref: 3.1).

Table 5.11: Embedded Mitigation Relating to Onshore Biodiversity

Parameter	Mitigation measures embedded into the project design
General	
Project design	<p>Careful routing of the onshore cable route has taken place to avoid key areas of sensitivity where possible, e.g. the terrestrial parts of Sandwich Bay SAC have been avoided.</p> <p>The proposed works at the landfall under Option 2 have been significantly reduced in extent to reduce associated permanent loss of saltmarsh habitat.</p> <p>The introduction of HDD has been brought forward under Option 1 to avoid interaction with the sea wall and areas of saltmarsh, subject to the results of SI works.</p>
Construction	
Micro-siting	Where practicable, micro-siting of the final cable alignment and other associated works will be employed so that important receptors are avoided or impacts minimised.
Protection of retained habitats	Protective fencing will be used as necessary to protect retained habitats from inadvertent damage during construction.
Reinstatement and restoration (terrestrial habitats)	<p>For cabling and associated works within Stonelees Nature Reserve (and Pegwell Bay Country Park under options 1 and 3i) all excavated soils will be carefully stored and reinstated as soon as possible or, where appropriate, disposed of and replaced with neutral soils in the case of contaminated sediments within Pegwell Bay Country Park.</p> <p>If reinstatement is not possible (e.g. under landfall option 2 – installation of the TJBs and cabling above ground within the country park) the resulting berm would be restored to species-rich grassland in accordance with the OLEMP (Document Ref: 8.7).</p> <p>Any water bodies within Stonelees Nature Reserve that cannot be avoided will be replaced, on a 2:1 basis, elsewhere within the RLB or within the adjacent field (subject to landowner agreement).</p>
Reinstatement and restoration (intertidal habitats)	Details of measures to reinstate and restore saltmarsh habitat providing supporting habitat for non-breeding waterbirds, following construction, are provided in the SMRMP (Document Ref: 8.13).
Ecological Clerk of Works	A suitably qualified Ecological Clerk of Works (ECoW) will be employed for the duration of the construction period (and any subsequent reinstatement works), although this may not necessarily be a full-time role throughout. The ECoW will oversee the implementation of the LEMP and check that the works comply with applicable wildlife legislation and the relevant commitments made in this ES and associated management plans. The ECoW will provide regular reports to Natural England and other relevant stakeholders throughout the construction period (and subsequent reinstatement). The frequency and format of these updates will be agreed as part of the detailed LEMP.

Parameter	Mitigation measures embedded into the project design
Pre-construction surveys	<p>Due to the time that will have elapsed since the last surveys and the possibility that certain protected or controlled species presence or activity could have changed in the intervening period, or being unable to carry out surveys due to access restrictions, surveys for the following species will be undertaken prior to construction commencing:</p> <ul style="list-style-type: none"> • Invasive non-native species; • Natterjack toad; • Great crested newt (Pegwell Bay Country Park only); • Breeding birds (focussing on Schedule 1 species); • Badger; • Water vole; and • Otter. <p>The results of the pre-construction surveys would inform the need for any mitigation measures, as set out or required in the LEMP.</p>
Seasonal restrictions	<p>Following broadly similar mitigation measures employed for Nemo Link and Thanet Offshore Wind Farm (TOWF), seasonal restrictions would be implemented to restrict works with potential to cause significant disturbance to non-breeding waterbirds utilising intertidal habitats in Pegwell Bay. These restrictions would apply to all construction works within intertidal habitats and at the shoreline, i.e. within any coffer dam at the proposed landfall location (as required under options 2 and 3 for the landfall). This would prevent any works taking place in these areas during the period October to March inclusive.</p> <p>Any driven/ percussive piling within Pegwell Bay Country Park (if required), e.g. if additional cofferdams are required to prevent the migration of contaminants if a buried solution is feasible (landfall options 1 and 3), would also be subject to a timing restriction and would not take place during the period October to March inclusive. HDD works (landfall option 1), if feasible, would also be subject to the same timing restriction.</p>
Screening of works	<p>Any works within 250 m of intertidal habitats that are not covered by seasonal restrictions but are in direct line of sight from intertidal habitats, e.g. works on the TJBs, would only take place during October - March following the erection of screening fencing to avoid visual disturbance to non-breeding waterbirds using intertidal habitats. The details of proposed screening will be provided in the detailed LEMP and will be subject to agreement with Natural England.</p>
Mitigation for possible displacement of recreational visitors from Pegwell Bay Country Park	<p>Mitigation to minimise disturbance to non-breeding waterbirds from displaced visitors would include:</p> <ul style="list-style-type: none"> - Erection of additional signs to discourage people from entering intertidal habitats during sensitive periods; and - The ECoW (or temporary warden/ natural ambassador) would monitor visitor disturbance to intertidal areas across all parts of Pegwell Bay during the sensitive October to March period and would speak to visitors to discourage them from entering intertidal habitats, if required. Regular reports to Natural England and other relevant stakeholders regarding the outcome of the monitoring and visitor interactions will be provided throughout the construction period. The frequency and format of these updates will be agreed as part of the detailed LEMP.

Parameter	Mitigation measures embedded into the project design
Terrestrial invertebrate mitigation strategy	<p>As set out in the OLEMP (Document Ref: 8.7), a terrestrial invertebrate mitigation strategy (TIMS) will be developed post consent and will form part of the detailed LEMP. The TIMS will be informed by a detailed invertebrate survey of affected areas prior to production and agreement of the detailed LEMP.</p> <p>The TIMS will include specific measures to be employed within Pegwell Bay Country Park and Stonelees Nature Reserve to avoid or reduce effects on: species forming part of the Thanet Coast and Sandwich Bay Ramsar wetland invertebrate assemblage (if present); species forming part of the Sandwich Bay to Hacklinge Marshes SSSI invertebrate assemblage (if present) and any other nationally rare or scarce species which could be significantly affected, for example KWT has highlighted the presence of nationally rare micromoths associated with the plant tansy within Stonelees Nature Reserve. The TIMS will also include measures to ensure that suitable habitat for these species is maintained and enhanced following construction works.</p> <p>The TIMS will also include details of measures to maintain and enhance any important invertebrate populations associated with the ephemeral/ short perennial habitat within the proposed substation site and associated compound and laydown area. These will include the retention and enhancement of an area of 0.4 ha on the eastern side of the substation site. Measures involving the creation and management of ephemeral/ short perennial habitat on open ground within the substation compound, where possible, will also be included.</p>
Mitigation for reptiles	<p>Reasonable measures will be employed to reduce the chances of inadvertently killing or injuring individual viviparous lizards or slow-worms during construction works. Given that large areas of suitable habitat will remain unaffected by the works and most habitats will be reinstated or restored following construction, fencing and translocation are not considered appropriate. Mitigation will therefore involve the management of vegetation (e.g. strimming long grass) to discourage occupation by reptiles and the identification/removal of potential refugia and hibernacula (if present) by the ECoW prior to construction works taking place in the relevant area.</p> <p>The retention and management of an area of 0.4 ha on the eastern side of the substation site (see above in respect of terrestrial invertebrates) would also be designed to benefit viviparous lizard.</p>
Mitigation for breeding birds	<p>Wherever possible, vegetation which could support nesting birds (all species) will be cleared outside the main bird breeding season (March to August inclusive) to avoid damage to, or destruction of nests. Where this is not possible vegetation to be cleared will be checked for active nests by the ECoW prior to clearance. If active nests are found vegetation clearance in the applicable area will be delayed until the relevant nesting attempt(s) has finished.</p> <p>Surveys for Schedule 1 species and other breeding species of conservation concern which are likely to be particularly sensitive to disturbance, e.g. redshank, will take place prior to and during construction (as required). Avoidance of disturbance to these species whilst nesting will be achieved through the implementation of disturbance-free buffer zones around active nests. The extent of any buffer zones will be species and location-specific and will be determined by the ECoW, taking into consideration relevant guidance and experience from other sites, as appropriate. The ECoW will also monitor nesting attempts to check that the agreed buffer zones are successful.</p>
Mitigation for bats	<p>A small number of trees which could potentially be affected by the proposed development were identified as having low potential to support bat roosts (see Volume 5, Annex 5-9 and Annex 5-12, Document Refs: 6.5.5.9 and 6.5.5.12 respectively). In accordance with current BCT guidelines, if felling of any of these trees is required appropriate precautions will be undertaken during felling.</p>
Mitigation for mammals (generic)	<p>The adoption of a site speed limit of 15mph during construction will reduce the likelihood of accidental injury/killing of mammals by construction traffic.</p> <p>All potentially dangerous substances or materials will be carefully stored to prevent them causing any harm to animals which may enter working areas at night.</p> <p>All excavations greater than 1m depth will either be covered at night or designed to include a ramp to allow animals a means of escape should they fall in.</p>
Mitigation to avoid the spread of invasive non-native species	<p>Stands of invasive non-native species, whether existing or identified during pre-construction surveys, will be avoided wherever possible. If avoidance is not possible a detailed mitigation plan will be produced and agreed as part of the CEMP to ensure compliance with the relevant legislation (see CoCP, Document Ref: 8.1).</p>

Parameter	Mitigation measures embedded into the project design
Dust	Dust control measures that will be implemented during construction to avoid or reduce the potential for significant effects on ecological receptors are set out in Volume 3, Chapter 9: Air Quality (section 9.15) (Document Ref: 6.3.9) and will form part of the CEMP (see CoCP, Document Ref: 8.1).
Accidental pollution	<p>A summary of measures that will be employed to avoid or reduce accidental spills and potential contaminant releases in the intertidal environment is provided in Volume 2, Chapter 5: Subtidal and Benthic Ecology (Document Ref: 6.2.5) with full details to be included in a PEMP post consent.</p> <p>A summary of measures that will be employed to avoid or reduce accidental spills and potential contaminant releases in the onshore environment is provided in Volume 3, Chapter 6: Ground Conditions, Flood Risk and Land Use (Document Ref: 6.3.6).</p> <p>Details of measures to avoid accidental spills and potential release of contaminants within the onshore environment are provided in the CoCP (Document Ref: 8.1).</p>
Biodiversity enhancements	<p>Initial proposals for biodiversity enhancements, as required under relevant planning policy, are provided in the OLEMP (Document Ref: 8.7). These include:</p> <ul style="list-style-type: none"> • Creation of additional ponds/ pools; • Creation of reptile refugia/ hibernacula; • Erection of bat and bird boxes; • Scrub management to promote grassland habitat and benefit nightingale; and • Creation of small areas of sacrificial crop (for seed-eating birds).
O&M	
Seasonal restrictions	Planned O&M works at the shoreline or within intertidal habitats will avoid the period October to March inclusive (as for construction).
Protection of sensitive habitats and protected species	Planned inspections will follow an agreed methodology, set out in the LEMP, designed to avoid damage to sensitive habitats or disturbance to protected species. Regular inspections of any joint pits located within Stonelees Nature Reserve will be undertaken on foot to avoid damage to retained or reinstated habitats within the onshore parts of the Thanet Coast and Sandwich Bay SPA/ Ramsar and Sandwich Bay to Hacklinge Marshes SSSI. Any maintenance within Stonelees Nature Reserve would only be undertaken following discussions with the relevant Statutory Nature Conservation Bodies. Regular inspections of the TJBs and joint pits within Pegwell Bay Country Park will be undertaken on foot or using a light vehicle only which will be restricted to existing tracks.
Accidental pollution	A summary of measures that will be employed to avoid or reduce accidental spills and potential contaminant releases in the onshore environment during planned O&M works is provided in Volume 3, Chapter 6: Ground Conditions, Flood Risk and Land Use (Document Ref: 6.3.6).
Unplanned corrective O&M works	The extent or nature of any unplanned corrective maintenance required can't be predicted at this stage and therefore requirements for mitigation during unplanned O&M works can't be predicted at this time. Where unplanned O&M works are required, appropriate mitigation measures would be developed and agreed with relevant consultees prior to works taking place.
Decommissioning	
All	Embedded mitigation measures implemented in the decommissioning phase are likely to be similar to those implemented during the construction phase and would adhere to relevant good practice and legislation in place at the time of decommissioning.

5.10 Environmental Assessment: Construction Phase

- 5.10.1 This section assesses potential effects during the construction phase. Effects are assessed for each of the receptors subject to detailed assessment (see paragraph 5.7.123) in turn. Each of the potential effects listed in Table 5.10 has been assessed for each receptor, where relevant (although see below in relation to potential pollution impacts). For each effect, potential impacts are characterised and the significance of the resulting effects is determined in accordance with the methodology set out in section 5.5, on the basis that the embedded mitigation measures listed in Table 5.11 are all implemented.
- 5.10.2 In terms of pollution potential effects on ecological receptors resulting from dust generated during construction are assessed in Volume 3, Chapter 9: Air Quality (Document Ref: 6.3.9). The assessment concludes that following the implementation of the proposed dust controls the magnitude of impact will be negligible and effects will not be significant.
- 5.10.3 Potential effects on ecological receptors resulting from emissions from construction traffic are also assessed in Volume 3, Chapter 9: Air Quality (Document Ref: 6.3.9). The assessment concludes that the magnitude of impact of deposition of NO_x, nitrogen and acid on ecological receptors will be negligible and effects will not be significant.
- 5.10.4 Following the implementation of embedded mitigation measures set out in Volume 2, Chapter 5: Benthic Subtidal and Intertidal Ecology (Document Ref: 6.2.5), Volume 3, Chapter 6: Ground Conditions, Flood Risk and Land Use (Document Ref: 6.3.6) and the CoCP (Document ref: 8.1) any effects resulting from accidental pollution of water-based resources are also not likely to be significant.
- 5.10.5 On the basis of the above, effects relating to pollution (air and water-based) are not likely to be significant for any receptor and have therefore not been considered in the detailed receptor by receptor assessments presented below.
- 5.10.6 A summary of ecological receptors and potential effects subject to detailed assessment during the construction phase is provided in Table 5.12.

Table 5.12: Ecological Receptors and Potential Effects Subject to Detailed Assessment during the Construction Phase

Receptor	Potential Effect				
	Permanent Habitat Loss	Temporary Habitat Loss/ Disturbance	Disturbance (noise & vibration, visual, lighting)	Disturbance due to possible displacement of recreational users from Pegwell Bay Country Park	Accidental killing/ injury
Designated Sites					
Thanet Coast and Sandwich Bay SPA – Non-breeding European golden plover and ruddy turnstone	✓	✓	✓	✓	n/a
Thanet Coast and Sandwich Bay Ramsar – non-breeding ruddy turnstone	✓	✓	✓	✓	n/a
Thanet Coast and Sandwich Bay Ramsar – wetland invertebrate assemblage	n/a	✓	n/a	n/a	n/a
Sandwich Bay and Hacklinge Marshes SSSI –	✓	✓	✓	✓	n/a

Receptor	Potential Effect				
	Permanent Habitat Loss	Temporary Habitat Loss/ Disturbance	Disturbance (noise & vibration, visual, lighting)	Disturbance due to possible displacement of recreational users from Pegwell Bay Country Park	Accidental killing/ injury
aggregations of non-breeding birds					
Sandwich Bay and Hacklinge Marshes SSSI – assemblage of breeding birds	✓	✓	✓	n/a	n/a
Sandwich Bay and Hacklinge Marshes SSSI – invertebrate assemblage	✓	✓	n/a	n/a	n/a
Sandwich and Pegwell Bay NNR (receptors not covered elsewhere in assessment)	n/a	✓	n/a	n/a	n/a
Ash Level and South Richborough Pasture LWS	n/a – effects on faunal receptors covered elsewhere in assessment				

Receptor	Potential Effect				
	Permanent Habitat Loss	Temporary Habitat Loss/ Disturbance	Disturbance (noise & vibration, visual, lighting)	Disturbance due to possible displacement of recreational users from Pegwell Bay Country Park	Accidental killing/ injury
A256 (Sandwich Road) Roadside Nature Reserve	n/a	✓	n/a	n/a	n/a
Sandwich and Pegwell Bay KWTR	n/a – covered under Sandwich and Pegwell Bay NNR				
Habitats/ Vegetation					
Semi-improved grazing marsh pasture to the east and southwest of the RLB	n/a	n/a	n/a	n/a	n/a
Ephemeral pools in Stonelees Nature Reserve	✓	✓	n/a	n/a	n/a
River Stour	n/a	n/a	n/a	n/a	n/a
Ephemeral/ short perennial habitats within the proposed substation site	✓	✓	n/a	n/a	n/a

Receptor	Potential Effect				
	Permanent Habitat Loss	Temporary Habitat Loss/ Disturbance	Disturbance (noise & vibration, visual, lighting)	Disturbance due to possible displacement of recreational users from Pegwell Bay Country Park	Accidental killing/ injury
and tenant relocation area					
Invasive non-native plant species	n/a – effects considered in relation to inadvertent spreading of species only				
Faunal Species (where not included as qualifying or notified features for designated sites)					
Terrestrial invertebrates – outside designated sites	✓	✓	n/a	n/a	n/a
Reptiles – slow-worm and viviparous lizard	✓	✓	n/a	n/a	✓
Breeding birds – Schedule 1 species	✓	✓	✓	n/a	✓
Breeding birds – turtle dove and nightingale	n/a	✓	n/a	n/a	✓ (in respect of birds and active nests)

Receptor	Potential Effect				
	Permanent Habitat Loss	Temporary Habitat Loss/ Disturbance	Disturbance (noise & vibration, visual, lighting)	Disturbance due to possible displacement of recreational users from Pegwell Bay Country Park	Accidental killing/ injury
Breeding birds – other species of conservation concern	n/a	✓	n/a	n/a	✓ (in respect of birds and active nests)
Breeding birds – all other species	n/a	n/a	n/a	n/a	✓ (in respect of birds and active nests)
Non-breeding birds – lapwing	✓	✓	✓	✓	n/a
Non-breeding birds – other waterbird species	✓	✓	✓	✓	n/a
Bats	✓	✓	✓	n/a	✓
Water vole	n/a – not likely to be affected based on current survey data				
Otter	n/a – not likely to be affected based on current survey data				

Thanet Coast and Sandwich Bay SPA

European Golden Plover and Ruddy Turnstone (Non-breeding)

Permanent Habitat Loss

- 5.10.7 A total of up to 1,399 m² of saltmarsh, extending to a maximum of 18.5 m from the existing seawall, would be permanently lost under option 2 for construction of the landfall. The saltmarsh to be lost represents upper saltmarsh, subject to tidal inundation on an infrequent basis and characterised by relatively tall (>30 cm), dense vegetation dominated by *Spartina*. Information on the potential importance of this upper saltmarsh habitat to the designated bird species has been drawn from the wider literature (e.g. Cramp & Perrins, 1997 *et seq.* and Gillings & Sutherland, 2007) but also Hodgson, 2016 for ruddy turnstone and Henderson & Sutherland, 2017, for European golden plover) as well as survey data collected in winter 2016-17 (Vol 5, Annex 5-4, Ornithology Baseline Report, Document Ref: 6.5.5.4).
- 5.10.8 European golden plover typically feed on intertidal mudflats and agricultural land (arable and pasture), roosting on intertidal mudflats at low tide, on open saltmarsh at low and high tide and on agricultural land (arable and pasture). Like most plovers, European golden plover avoids terrain in which it cannot easily run and which has poor visibility of approaching predators. The upper saltmarsh habitat to be lost does not provide suitable habitat for feeding or roosting European golden plover as the vegetation is too tall and dense. The area which could be lost is also situated adjacent to a well-used footpath and therefore subject to regular disturbance which further reduces its potential value to roosting European golden plover.
- 5.10.9 Survey data collected in winter 2016-17 (see Vol 5, Annex 5-4, Ornithology Baseline Report, Document Ref: 6.5.5.4) identified the presence of a roosting flock of 300 European golden plover in close proximity to the location of the landfall on a single hourly count during the November 2016 survey visit, i.e. on one out of 30 counts. There were no other records of European golden plover in the immediate vicinity of the landfall during the remainder of the winter 2016-17 surveys. The survey data indicate a very small overlap between a small number of birds forming part of this flock and the area which could be affected by the extension of the seawall (see Vol 5, Annex 5-13 (Document Ref: 6.5.5.13, Figure 5). However, mapping the location of flocks of waterbirds in the field is subject to a relatively high degree of error and in reality it is considered likely that these birds were actually using the more open saltmarsh, just to the east of the area which could be affected by the seawall extension, where the habitat is more suitable for them. Even in the unlikely event that small numbers of birds were using the unsuitable upper saltmarsh habitat on this occasion, the very low number of birds affected and the infrequency of use indicates that the level of usage is not significant.

- 5.10.10 Outside the breeding season ruddy turnstone are almost entirely coastal preferring shores which are stony, rocky or covered with seaweed. The upper saltmarsh habitat which could be lost is not suitable for ruddy turnstone and no ruddy turnstones were recorded within at least 500 m of the landfall during surveys in winter 2016-17. Hodgson (2016) suggests that prior to high tide, ruddy turnstones from the Thanet Coast and Sandwich Bay SPA flew to join a roost, 2.5 km west of Whitstable Harbour on the north Kent coast, within the Swale SPA and some 18 km north-west of the proposed development. Tabulated survey results from the same report indicate that ruddy turnstone concentrations within the Thanet Coast and Sandwich Bay SPA occur mainly across the northern extremities of the SPA, heading west toward Whitstable, with Pegwell Bay supporting only a small proportion of the total SPA population.
- 5.10.11 On the basis of the above there will be no permanent loss of intertidal habitat used by non-breeding European golden plover or ruddy turnstone.
- 5.10.12 A total of up to 4.1 ha of hardstanding and ephemeral/ short perennial vegetation, outside the SPA, could be permanently lost during construction of the substation. European golden plover and ruddy turnstone were not recorded during transect surveys of terrestrial habitats in winter 2016-17 and the habitat at the substation site, which is currently used for vehicle storage, is not likely to be used by either species. There will therefore be no permanent loss of terrestrial habitat used by non-breeding European golden plover or ruddy turnstone.
- 5.10.13 The conservation objectives for the SPA require the maintenance of: the extent and distribution of the habitats of the qualifying features; the structure and function of the habitats of the qualifying features; the supporting processes on which the habitats of the qualifying features rely; the population of each of the qualifying features, and the distribution of the qualifying features within the site. None of the conservation objectives will be undermined by the permanent loss of habitat, which is unsuitable for European golden plover or ruddy turnstone. **No significant effect on European golden plover or ruddy turnstone is therefore predicted in terms of permanent habitat loss.**

Temporary Habitat Loss/ Disturbance

- 5.10.14 The temporary loss/ disturbance of intertidal habitats during construction is covered in more detail in Volume 2, Chapter 5: Subtidal and Intertidal Benthic Ecology (Document Ref: 6.2.5) but is discussed here with respect to the indirect effect on European golden plover which can use these habitats in significant numbers (the number of ruddy turnstone using these habitats is much smaller). Approximately 80,000 m² of the intertidal foreshore (mudflats and sandflats) (0.71% of the total intertidal foreshore habitat within the SPA) could be disturbed during construction. The maximum extent of saltmarsh disturbed during construction, from trenching and the cofferdam (under options 2 and 3 for the landfall) would be 5,875 m² (approximately 0.53% of the total saltmarsh habitat within the SPA).

- 5.10.15 Saltmarsh will be reinstated in accordance with the draft SMRMP (Document Ref: 8.13). Recent monitoring surveys indicate that following the TOWF installation the saltmarsh feature reverted to its pre-construction status relatively quickly with no significant change being found after two years. Intertidal mudflats are likely to revert to their pre-construction status within a much shorter period.
- 5.10.16 A total of up to 7.5 ha of terrestrial habitat could be temporarily lost/ disturbed during construction. European golden plover and ruddy turnstone were not recorded during transect surveys of terrestrial habitats undertaken for this project in winter 2016-17. Similarly, no European golden plover were recorded within terrestrial habitats within or adjacent to the RLB during surveys of the wider Thanet to Sandwich Bay area undertaken by Henderson & Sutherland (2017) during the same period. Terrestrial habitats within the RLB include semi-improved grassland, which is mostly rank and interspersed with scrub, scrub and woodland/scattered trees, amenity grassland and hard standing with areas of ephemeral/ short perennial vegetation currently used for vehicle storage. None of these habitats are potentially suitable for European golden plover or ruddy turnstone. There will therefore be no temporary loss or disturbance of terrestrial habitat used by non-breeding European golden plover or ruddy turnstone.
- 5.10.17 Adverse effects on European golden plover and ruddy turnstone resulting from temporary loss or disturbance of intertidal habitat will be of short-term duration (maximum two years, in the case of saltmarsh but much less for mudflats) and will extend across a very small proportion of the available habitat within the SPA. None of the conservation objectives for the SPA will therefore be undermined in the medium to long-term. There will be no temporary loss or disturbance of terrestrial habitat for either species. **No significant effect on European golden plover or ruddy turnstone is therefore predicted in terms of temporary habitat loss/ disturbance.**

Disturbance (Noise and Vibration, Visual, Lighting)

- 5.10.18 Peak European golden plover numbers at Pegwell Bay occur during the period October to March and peak ruddy turnstone numbers occur between November and March. Much lower numbers of both species are recorded outside this period. Embedded mitigation has been included that would involve a timing restriction on all works within the intertidal habitats and at the shoreline (see Table 5.11). This would prevent any works taking place in these areas during the period October to March inclusive. In addition, any works within 250 m of inter-tidal habitats and in direct line of sight from intertidal habitats, e.g. works on the TJBs, would only take place following the erection of screening fencing to avoid visual disturbance. Noise generated by construction works away from the shoreline would be regular in character (birds' tolerance of regular noise is much higher – Cutts *et al.*, 2008) and given the intervening distance it is likely that any birds using the intertidal would quickly become habituated to it. In the unlikely event that driven piling is required within 250 m of inter-tidal areas this would also be subject to a timing restriction and would not take place during the period October to March. The implementation of the embedded mitigation would therefore avoid significant disturbance to non-breeding European golden plover and ruddy turnstone using intertidal habitats and none of the conservation objectives for the SPA will be undermined.
- 5.10.19 None of the terrestrial habitats within the RLB are potentially suitable for European golden plover or ruddy turnstone and neither species has been recorded using terrestrial habitats within at least 250 m of the RLB during surveys in 2016-17. It is possible that European golden plover could use suitable terrestrial habitats within 250 m of the RLB at night, e.g. the golf courses to the west and the semi-improved grazing marsh to the southwest and to the east, on the other side of the River Stour. However, most works will only take place during the period 07.00 to 19.00 and those works that could take place at night (i.e. HDD or works at the substation) will either be >250 m from potentially suitable habitat or screened from it by existing vegetation. Furthermore, if the HDD option for the landfall is taken forward this would be subject to the timing restrictions outlined above (because it would involve works within the intertidal). Significant disturbance to European golden plover or ruddy turnstone using terrestrial habitats is therefore unlikely.
- 5.10.20 On the basis of the above, no significant effect on European golden plover or ruddy turnstone is predicted in terms of disturbance.

Disturbance due to Possible Displacement of Recreational Users from Pegwell Bay Country Park

- 5.10.21 Although works at the shoreline will be subject to a timing restriction and will not take place during the period October to March, other works could take place within the country park during the winter months. Disturbance to non-breeding European golden plover and ruddy turnstone is therefore possible if visitors are displaced from the country park to other more sensitive areas elsewhere within Pegwell Bay.

- 5.10.22 To examine the potential extent of possible displacement a desk-based study was undertaken. As part of this study, data for the number of car parking tickets sold at Pegwell Bay Country Park were provided by KCC for both 2016 and 2017. Comparison of the data between years indicated no significant difference in the number of visitors between the period that construction works for the Nemo Link were taking place within the country park (April to September 2017) and the corresponding period in 2016 (see Volume 3, Chapter 4: Tourism and Recreation (Document Ref: 6.3.4), Figure 4.1 and Table 4.8). This strongly suggests that visitor numbers at the country park are not likely to be significantly affected by the proposed construction works, which would be of similar scale to the works for the Nemo Link.
- 5.10.23 The above notwithstanding, a precautionary approach has been adopted which assumes that some displacement of recreational users of the country park is possible. Consideration of a visitor study carried out in 2012 (Strategic Marketing, 2012) indicates that the majority of visitors to Pegwell Bay Country Park (61%) came from Cliffsend or the Thanet towns. 58% of visitors' main reason for visiting was to walk their dog(s), most planned to walk less than two miles, 91% came by car and 87% were repeat visitors. This suggests that any displacement is most likely to involve regular dog walkers, travelling by car from the north. It is therefore assumed that displacement is most likely to affect sites to the north of the country park with easy vehicular access. This assumption is supported by anecdotal information from the operator of the coffee stall in the country park car park (pers. comm., March 2018) who, despite the car parking data, suggested that visitors were displaced during construction works for the Nemo Link and went instead to the 'pirate ship' picnic site at Cliffsend or the Western Undercliff at Ramsgate. Intertidal habitats adjacent to both locations are readily accessible and are already subject to relatively high numbers of visitors (Duncan Watson, personal observation).
- 5.10.24 The main concern of Natural England is that any displaced dog walkers could utilise the intertidal habitats. It is considered very unlikely that displaced visitors would utilise the saltmarsh habitats adjacent to Pegwell Bay Country Park which contain deep, wet creeks and are very difficult to walk across. It is also considered unlikely that significant numbers of visitors would utilise the mudflats and sandflats, although some usage of these areas, particularly in the northern half of Pegwell Bay, close to the alternative car parks at Cliffsend and the Western Undercliff, is possible. However, as a precaution, embedded mitigation has been proposed to discourage any displaced visitors from accessing intertidal habitats during the sensitive October to March period (see Table 5.11).
- 5.10.25 Taking into account the low likelihood of visitor displacement, the location of the sites which visitors are most likely to be displaced to and the embedded mitigation, the conservation objectives for the SPA will not be undermined. **No significant effect on European golden plover or ruddy turnstone is therefore predicted in terms of disturbance due to the possible displacement of recreational users from Pegwell Bay Country Park.**

Thanet Coast and Sandwich Bay Ramsar

Ruddy Turnstone (Non-breeding)

- 5.10.26 An assessment of potential effects on ruddy turnstone is presented above in respect of the Thanet Coast and Sandwich Bay SPA are is not repeated here. **In conclusion, following the implementation of embedded mitigation measures no significant effects on ruddy turnstone are predicted.**

Wetland Invertebrate Assemblage

- 5.10.27 Three wetland invertebrate assemblage species have the potential to be present within the parts of the Ramsar lying within or immediately adjacent to the RLB: the wasps *Didineis lunicornis* and *Ectemnius ruficornis*; and the woodlouse *Eluma caelata*. If present, all three species are only likely to be present in the Stonelees Nature Reserve section of the RLB and have the potential to be affected by temporary habitat loss/disturbance. There will be no permanent habitat loss within this area and these species are not likely to be subject to disturbance due to noise and vibration, visual or lighting or displacement of recreational users from Pegwell Bay Country Park, or be significantly affected by accidental killing/ injury.

Temporary Habitat Loss/ Disturbance

- 5.10.28 Approximately 350 m of cabling would be trenched through Stonelees Nature Reserve, resulting in the temporary loss/ disturbance of up to 1.05 ha of habitat including disturbed ground, scrub, semi-improved neutral grassland and at least one small ephemeral water body. All of these habitat types are also present within the nature reserve in areas outside the RLB. Terrestrial habitats would be reinstated as soon as possible following completion of the works and the ephemeral water bodies would be replaced elsewhere within the same field.
- 5.10.29 Embedded mitigation includes the development of a terrestrial invertebrate mitigation strategy, which would be informed by a detailed survey of affected areas, prior to construction commencing. Specific measures will be included in the strategy to reduce effects on the three assemblage species, if present, e.g. micro-siting, where possible. Measures will also be included to ensure that suitable habitat for these species is maintained and enhanced following construction works.

5.10.30 There are no conservation objectives for the Thanet Coast and Sandwich Bay Ramsar. However, it is reasonable to assume that conservation objectives would include the maintenance of the populations and distribution of wetland invertebrate assemblage species and their supporting habitats. Given the relatively small area which would be subject to temporary loss; the availability of similar habitats outside the RLB; the proposed reinstatement of habitats; and the embedded mitigation which includes a targeted mitigation strategy if any of the three assemblage species are present, the conservation status of the relevant species is not likely to be significantly affected. **As such no significant effect on the Ramsar wetland invertebrate assemblage is predicted in terms of temporary habitat loss/ disturbance.**

Sandwich Bay to Hacklinge Marshes SSSI

Aggregations of Non-breeding Birds

5.10.31 Non-breeding European golden plover, grey plover, ringed plover and sanderling are all notified features of the SSSI. An assessment of potential effects on European golden plover is presented above in respect of the Thanet Coast and Sandwich Bay SPA are is not repeated here. The remaining species almost exclusively utilise coastal and intertidal habitats outside the breeding season and therefore the assessment of potential effects relates solely to intertidal areas.

Permanent Habitat Loss

5.10.32 A total of up to 1,399 m² of saltmarsh would be permanently lost under option 2 for construction of the landfall. No grey plover, sanderling or ringed plover were recorded using this area during surveys in winter 2016-17. Furthermore, this area, which comprises an area of upper saltmarsh, adjacent to a well-used footpath is considered very unlikely to be used by any of these species, even on an occasional basis. **There will therefore be no permanent loss of intertidal used by any of the notified non-breeding wader species and no significant effect is predicted in terms of permanent habitat loss.**

Temporary Habitat Loss/ Disturbance

5.10.33 The temporary loss/ disturbance of intertidal habitats was discussed above in relation to the Thanet Coast and Sandwich Bay SPA. As for the SPA qualifying features, adverse effects on grey plover, ringed plover and sanderling resulting from temporary loss or disturbance of intertidal habitat will be of short-term duration (maximum two years for saltmarsh but much less for mudflats) and will extend across a very small proportion of the available habitat within the SSSI. **No significant effect on any of the notified non-breeding wader species is therefore predicted in terms of temporary habitat loss/ disturbance.**

Disturbance (Noise and Vibration, Visual, Lighting)

5.10.34 Peak grey plover and sanderling numbers at Pegwell Bay occur during the period October to March with much lower numbers of both species recorded outside this period. As discussed in relation to the SPA, embedded mitigation has been included to avoid disturbance to non-breeding European golden plover and ruddy turnstone using intertidal habitats. The implementation of the embedded mitigation would also avoid significant disturbance to non-breeding grey plover and sanderling. **No significant effect on grey plover or sanderling is therefore predicted in terms of disturbance.**

5.10.35 Peak numbers of ringed plover at Sandwich Bay occur during the spring and autumn passage periods and they won't therefore benefit from the proposed timing restrictions. Negative effects due to disturbance are likely to be greater during winter due to colder temperatures and shorter day length however. During cold periods birds must feed more quickly and forage more successfully to maintain their basal metabolic rate in order to survive. As days are short they also have to feed at night, using different types of food searching strategies in the dark. Their prey will also tend to burrow deeper during periods of cold weather. As such any disturbance to birds during this sensitive period that prevents them from obtaining enough food can have impacts on their survival. Disturbance at other times of year is likely to have a comparatively lower impact, nevertheless, some negative effects due to disturbance are still possible.

5.10.36 Passage ringed plover tend to use two main areas, an area of mudflats northeast of Shell Ness, just north of the main channel of the River Stour and an area of sand and mud to the east of Shell Ness, to the south of the main channel (see Volume 5, Annex 5-14: Passage of Ringed Plover in Sandwich Bay, Document Ref: 6.5.5.14). The first area is located entirely within the offshore RLB and the second area is partially within the RLB. Large numbers of ringed plover use these areas for a relatively short time period, often as little as a couple of days in spring and 4-6 weeks in autumn.

5.10.37 At this stage, before the offshore cable route has been finalised, it is not known whether the areas favoured by ringed plover will be affected by construction works. Similarly, in the absence of a detailed construction programme at this stage it is not known whether they could be affected at the times when peak numbers of ringed plover are present (i.e. mid-April to late May or August to September). It is quite possible that works will take place away from the favoured areas and/ or at times when passage birds are not present, in which case there would be no disturbance effect. However, a precautionary approach has been adopted here which assumes that works could take place within these areas (or within 250 m of these areas) at the times when passage ringed plover are present. Under this scenario some disturbance is likely.

5.10.38 If birds are disturbed from one of the main feeding areas they are most likely to move to the other favoured area. It is very unlikely that construction works would affect both of the favoured areas simultaneously due to the intervening distance and therefore disturbance of both favoured areas due to construction is unlikely. However, it is possible that other sources of disturbance, external to the project, could also affect the birds, with the additional disturbance resulting from construction works increasing the likelihood of displacement to less favoured feeding areas or even from Pegwell Bay altogether. **If displacement from the favoured areas occurred it could represent a significant negative effect on a receptor of national importance.** It is noted however that the likelihood that significant displacement will occur is relatively low.

5.10.39 Additional mitigation is proposed (see section 5.15) which would be implemented if: the final cable route passes within 250 m of the favoured areas; and construction works in those areas are due to take place during times when peak numbers of ringed plover are present. If the final routing does not pass within 250 m of the favoured areas, or works in the relevant areas do not take place during the periods mid-April to late May and August to September, no additional mitigation will be required.

Disturbance due to Possible Displacement of Recreational Users from Pegwell Bay Country Park

5.10.40 An assessment of potential disturbance effects of possible displacement of recreational users from Pegwell Bay Country Park was presented in relation to the SPA and is not repeated here. Taking into account the low likelihood of visitor displacement, the location of the sites which visitors are most likely to be displaced to and the embedded mitigation, that assessment concluded that no significant effect on the SPA qualifying species was likely. **The same conclusion (no significant effect) also applies to grey plover and sanderling, which are present at similar times of year to European golden plover and ruddy turnstone.**

5.10.41 Ringed plover are present in peak numbers during spring and autumn passage and the embedded mitigation would only partially apply. However, the main areas used by passage ringed plover are located some distance to the east and southeast of Pegwell Bay Country Park, with one area located on the opposite side of the channel of the River Stour. These areas are therefore unlikely to be affected by any displaced visitors who are more likely to use intertidal areas to the north of the country park. **No significant effect on passage ringed plover is therefore likely.**

Assemblage of Breeding Birds – Lowland Open Waters and their Margins

5.10.42 12 species forming part of this assemblage were recorded breeding within the ornithological survey area during the 2017 surveys. Of these species Cetti's warbler is included on Schedule 1 of the Wildlife & Countryside Act 1981 (as amended) and is considered separately in the section of Schedule 1 birds. The other species are assessed below.

Permanent Habitat Loss

5.10.43 A total of up to 1,399 m² of saltmarsh within the SSSI would be permanently lost under option 2 for construction of the landfall. None of the assemblage bird species were recorded breeding in this area during surveys in 2017. Furthermore, this area, which comprises an area of upper saltmarsh, adjacent to a well-used footpath is considered unlikely to be used for nesting by any of these species. Whilst this area could occasionally be used for foraging by assemblage species such as redshank and reed bunting the extent of habitat that could be lost is relatively small and similar habitat is widely available throughout the SSSI.

5.10.44 A total of up to 4.1 ha of hardstanding and ephemeral/ short perennial vegetation, outside the SSSI, could be permanently lost during construction of the substation. None of the assemblage bird species were recorded breeding in this area during surveys in 2017. Furthermore, this area, which is currently used for vehicle storage is considered unlikely to be used for nesting or foraging by any of these species.

5.10.45 On the basis of the above no significant effect on SSSI breeding bird assemblage species is predicted in terms of permanent habitat loss.

Temporary Habitat Loss/ Disturbance

5.10.46 The temporary loss/ disturbance of intertidal habitats was discussed above in relation to the Thanet Coast and Sandwich Bay SPA. Based on the results of the breeding bird surveys the only breeding bird assemblage species likely to breed in intertidal habitats within the study area is redshank. However, nesting has not been recorded in the area of saltmarsh which could be subject to temporary loss/ disturbance, either in 2017 or during previous surveys for the Nemo Interconnector.

5.10.47 Intertidal habitats could potentially be used by breeding bird assemblage species such as shelduck, mallard, ringed plover and redshank for foraging but as noted in respect of non-breeding waterbirds the temporary loss or disturbance of intertidal habitat will be of short-term duration (maximum two years but mostly much less) and will extend across a very small proportion of the available habitat within the SSSI.

5.10.48 A total of up to 1.05 ha of terrestrial habitat could be temporarily lost/ disturbed within the SSSI during construction including disturbed ground, scrub, semi-improved neutral grassland and at least one small ephemeral water body. This could potentially support a number of breeding bird assemblage species, including mallard, moorhen, cuckoo, sedge warbler and reed bunting. All of these habitat types are also present within the SSSI in areas outside the RLB. Terrestrial habitats would be reinstated as soon as possible following completion of the works and the ephemeral water bodies would be replaced elsewhere within the same field.

5.10.49 The temporary loss of a small extent of intertidal and terrestrial habitat, which is widespread in other parts of the SSSI is not likely to have a significant effect on the SSSI breeding bird assemblage.

Disturbance (Noise and Vibration, Visual, Lighting) and Damage to/ Destruction of Nests

5.10.50 Embedded mitigation will be implemented to avoid damage to, or destruction of nests and to avoid disturbance to the nests of species likely to be particularly sensitive to disturbance, e.g. redshank (see Table 5.11).

5.10.51 Following the implementation of the embedded mitigation no significant effect on the SSSI breeding bird assemblage is predicted in terms of disturbance.

Invertebrate Assemblage

5.10.52 As set out in section 5.7, 21 species forming part of the notified invertebrate assemblage could potentially be present within or adjacent to the RLB, although it was noted that for some of these species the potential for occurrence is relatively low whilst a number of the assemblage species are actually relatively common and widespread. 14 of the SSSI assemblage species which could potentially be present are associated with relatively open terrestrial habitats. Nine of the SSSI assemblage species which could potentially be present, including two of the species also associated with open terrestrial habitats, are associated with intertidal and/or shoreline habitats.

5.10.53 If present, these species have the potential to be affected by permanent habitat loss and temporary habitat loss/ disturbance. Invertebrate assemblage species are not likely to be subject to disturbance due to noise and vibration, visual or lighting or displacement of recreational users from Pegwell Bay Country Park, or be significantly affected by accidental killing/ injury.

Permanent Habitat Loss

5.10.54 A total of up to 1,399 m² of intertidal habitat (saltmarsh) within the SSSI would be permanently lost under option 2 for construction of the landfall. It is possible that up to nine of the SSSI invertebrate assemblage species could be present in this area, although none were recorded there during the survey in August 2017. There will be no permanent loss of terrestrial habitat within the SSSI.

5.10.55 Embedded mitigation includes the development of a terrestrial invertebrate mitigation strategy, which would be informed by a detailed survey of affected areas, prior to construction commencing. Specific measures will be included in the strategy to reduce effects on assemblage species, if present, e.g. micro-siting, where possible. Measures will also be included to ensure that suitable habitat for these species is maintained and enhanced following construction works.

5.10.56 Given the relatively small area of intertidal habitat to be lost, the wide availability of similar habitat elsewhere within the SSSI and the embedded mitigation proposed no significant effect on the SSSI invertebrate assemblage is predicted in terms of permanent habitat loss.

Temporary Habitat Loss/ Disturbance

5.10.57 Approximately 350 m of cabling would be trenched through Stonelees Nature Reserve, resulting in the temporary loss/ disturbance of up to 1.05 ha of habitat within the SSSI including disturbed ground, scrub, semi-improved neutral grassland and at least one small ephemeral water body. These habitats could potentially support up to 14 invertebrate assemblage species. However, all of these habitat types are also present within the nature reserve in areas outside the RLB, terrestrial habitats would be reinstated as soon as possible following completion of the works and the ephemeral water bodies would be replaced elsewhere within the same field. Embedded mitigation also includes the development of a terrestrial invertebrate mitigation strategy, as set out above.

5.10.58 On the basis of the above, the conservation status of the relevant species is not likely to be significantly affected. As such no significant effect on the SSSI invertebrate assemblage is therefore predicted in terms of temporary habitat loss/ disturbance.

Sandwich and Pegwell Bay NNR

5.10.59 The NNR includes Pegwell Bay Country Park, Stonelees Nature Reserve and all of the intertidal habitat within Pegwell Bay. With the exception of Pegwell Bay Country Park, these areas are all covered by other designations including Thanet Coast and Sandwich Bay SPA/Ramsar, Sandwich Bay SAC (in part) and Sandwich Bay to Hacklinge Marshes SSSI.

5.10.60 The effects on notified or qualifying species for the other designated sites are covered above and are not repeated here. Similarly the effects on important habitats and important and/or legally protected faunal species, some of which are present within the NNR, are covered in the sections on habitats and fauna below.

5.10.61 This section is therefore restricted to an assessment of receptors which are not covered elsewhere, i.e. semi-improved neutral grassland, scrub and woodland habitats, which could be affected by temporary habitat loss/ disturbance or accidental pollution during construction. There will be no permanent loss of terrestrial habitat within the NNR.

Temporary Habitat Loss/ Disturbance

5.10.62 Construction works within Pegwell Bay Country Park and Stonelees Nature Reserve could result in the temporary loss or disturbance of 5.06 ha of neutral semi-improved grassland, scrub and broad-leaved woodland habitats. All of these habitat types are widespread throughout the NNR and all are considered to be of no more than local value (see Table 5.8). Embedded mitigation would include; micro-siting of works (where possible) to avoid features of particular interest; the use of temporary fencing to avoid inadvertent damage to retained habitats; and the reinstatement or restoration of disturbed areas following construction works. **Following the implementation of embedded mitigation measures no significant adverse effect on the terrestrial habitats within the NNR is predicted.**

Non-Statutory Sites*Ash Level and South Richborough Pasture LWS*

5.10.63 This site lies adjacent to the REP site to the southwest, on the other side of the River Stour. It will not be affected by permanent or temporary habitat loss. Potential disturbance to faunal species within the LWS is covered in the section on fauna below.

Roadside Nature Reserve A256 (Sandwich Road)

5.10.64 This site is 450 m long and lies on the east side of Sandwich Road. The proposed new northern access and the existing access to the proposed construction compound in Pegwell Bay Country Park pass through the Roadside Nature Reserve. The Roadside Nature Reserve will therefore be subject to temporary habitat loss due to the creation of a new temporary access to the construction compound and the temporary widening of the existing access.

Temporary Habitat Loss/ Disturbance

5.10.65 The existing access from Sandwich Road to the proposed construction compound could be widened by up to 1 m on the northern side. This would result in a small loss of trees, shrubs and grassland habitats. In addition a new temporary access, of 5 m width, would be created from the A256 into the northern end of the proposed construction compound. This would result in the loss of a line of shrubs and immature trees of 5 m width plus the loss of a small strip of grassland alongside the road.

5.10.66 These areas would all be reinstated following construction, including the replacement of trees and shrubs removed during construction of the access (see the OLEMP, Document Ref: 8.7).

5.10.67 Given the small size of the areas affected and on the basis that these areas would be reinstated as soon as possible following completion of the works no significant effect is predicted in terms of temporary habitat loss/ disturbance.

Sandwich and Pegwell Bay KWTR

5.10.68 This reserve forms part of Sandwich and Pegwell Bay NNR and is therefore covered under the assessment for the NNR.

Habitats*Semi-improved Grazing Marsh Pasture*

5.10.69 Semi-improved grazing marsh pasture is present outside the RLB to the southwest of the REP site, on the other side of the River Stour and to the east of the proposed substation site and tenant relocation area, also on the opposite side of the River Stour. **This habitat type will not be affected by permanent or temporary habitat loss and potential impacts are therefore limited to pollution, which following the implementation of embedded mitigation will not be significant (see paragraphs 5.10.2-5.10.5).**

Standing Water – Ephemeral Pools in Stonelees Nature Reserve

5.10.70 36 pools were created in Stonelees Nature Reserve in 2003 to provide habitat for reintroduced natterjack toads. Although natterjack toad is no longer present, the pools themselves still retain some value and are assessed as potentially being of district importance. The cable routing within Stonelees Nature Reserve could result in the loss of at least one of these pools.

5.10.71 Embedded mitigation includes micro-siting of the cable route, where possible, to avoid loss or damage to the pools. Temporary fencing will also be used to avoid inadvertent damage to retained pools. Any pools which cannot be avoided will be replaced with new pools on a 2:1 basis. The existing ponds are all only 15 years old and contain limited vegetation. It is therefore anticipated that creation of new pools of similar value will be relatively straightforward, i.e. by excavating shallow depressions similar to those currently present (see also the OLEMP, Document Ref 8.7).

5.10.72 On this basis of the above the conservation status of the pools in Stonelees Nature Reserve will not be affected in the medium to long-term. **No significant effects on standing water habitat are therefore predicted.**

Running Water – River Stour

5.10.73 The River Stour is located outside the RLB. The river will therefore not be affected by permanent or temporary habitat loss and potential impacts are therefore limited to pollution, which following the implementation of embedded mitigation will not be significant (see paragraphs 5.10.2-5.10.5).

Ephemeral/ Short Perennial Vegetation

- 5.10.74 Ephemeral/short perennial habitat in the eastern part of the proposed substation site and tenant relocation areas meets the criteria for the priority habitat type ‘open mosaic habitats on previously developed land’. Taken together these areas are considered to be of district value.
- 5.10.75 A total of approximately 2.4 ha of ephemeral/ short perennial habitat could be permanently lost during construction of the substation. This figure includes the ephemeral/ short perennial habitat present within the proposed substation site itself plus the habitat within the associated construction and laydown area, although it is possible that habitat within the construction and laydown area (0.39 ha) may re-establish following construction.
- 5.10.76 The ephemeral/ short perennial habitat within the proposed tenant relocation area (approximately 0.9 ha in extent) will be retained *in situ*, although some of these areas may be used for the storage of HGV trailers, as takes place currently in similar habitats across much of the proposed substation site. This is not however considered likely to significantly reduce the value of the habitat.
- 5.10.77 Embedded mitigation includes the retention and enhancement of an area of 0.4 ha of ephemeral/ short perennial habitat on the eastern side of the substation site. Embedded mitigation proposals also include the creation and management of ephemeral/ short perennial habitat on open ground within the substation site once operational. It is not possible to quantify the amount of habitat that will be able to be created within the operational substation at this stage as the detailed design will not be finalised until post consent. However, the substation building is only likely to take up a relatively small proportion of the site meaning that a relatively large area of open land may be available for habitat restoration.
- 5.10.78 Following the implementation of embedded mitigation measures the loss of this priority habitat type is not predicted to be significant.

Invasive Non-native Species

- 5.10.79 Following the implementation of embedded mitigation to ensure compliance with relevant legislation no contravention of the relevant legislation, and therefore no significant effects are predicted in respect of invasive non-native species.

Faunal Species (where not included as qualifying or notified features for designated sites)*Terrestrial invertebrates*

- 5.10.80 Important populations of terrestrial invertebrates are potentially present outside the SSSI/Ramsar, both within Pegwell Bay Country Park and in the ephemeral/ short perennial habitats within the proposed substation site and tenant relocation area. Populations in Pegwell Bay Country Park have the potential to be affected by temporary habitat loss/ disturbance whilst populations within the proposed substation site (and associated compound/ laydown area) have the potential to be affected by permanent habitat loss. Invertebrate species are not likely to be subject to noise and vibration or visual disturbance, nor is the low level of lighting proposed during construction likely to cause disturbance to invertebrate species. The assessment therefore focusses on permanent and temporary habitat loss.

Permanent Habitat Loss

- 5.10.81 A total of approximately 2.4 ha of ephemeral/ short perennial habitat could be permanently lost during construction of the substation. The ephemeral/ short perennial habitat within the proposed tenant relocation area (approximately 0.9 ha in extent) will be retained, although some of these areas may be used for the storage of HGV trailers, as takes place currently in similar habitat within the proposed substation site. This is not considered likely to significantly reduce the value of the habitat for invertebrates.
- 5.10.82 Embedded mitigation includes the development of a terrestrial invertebrate mitigation strategy, which would be informed by a detailed survey of affected areas, prior to construction commencing. The mitigation strategy will include details of measures to maintain and enhance any important invertebrate populations associated with the ephemeral/ short perennial habitat within the proposed substation site and associated compound and laydown area. These will include the retention and enhancement of an area of 0.4 ha on the eastern side of the substation site. Embedded mitigation proposals also include the creation and management of ephemeral/ short perennial habitat on open ground within the substation site once operational, although as noted above it is not possible to quantify the amount of habitat that will be able to be created within the operational substation at this stage.
- 5.10.83 Following the implementation of embedded mitigation measures the permanent loss of ephemeral/ short perennial habitat is considered unlikely to adversely affect the conservation status of the invertebrate assemblage present and is not predicted to be significant.

Temporary Habitat Loss/ Disturbance

- 5.10.84 Approximately 4.01 ha of scrub, semi-improved neutral grassland and broad-leaved woodland habitat would be temporarily lost/ disturbed within Pegwell Bay Country Park. All of these habitat types are widespread across the country park in areas outside the RLB. Terrestrial habitats would be reinstated or restored as soon as possible following completion of the works.
- 5.10.85 As noted above, embedded mitigation includes the development of a terrestrial invertebrate mitigation strategy, which would be informed by a detailed survey of affected areas, prior to construction commencing. Specific measures will be included in the strategy to reduce effects on any particularly important invertebrate species identified, e.g. micro-siting, where possible. Measures will also be included to ensure that suitable habitat for these species is maintained and enhanced following construction works.
- 5.10.86 Following the implementation of embedded mitigation measures the temporary loss of habitat/ disturbance to habitats within Pegwell Bay Country Park is considered unlikely to adversely affect the conservation status of the invertebrate assemblage present and is not predicted to be significant.

Reptiles – slow-worm and viviparous lizard

- 5.10.87 A good population of viviparous lizard was recorded in suitable habitats within Pegwell Bay Country Park and Baypoint Sports Club and low populations were recorded in Stonelees Nature Reserve and at the proposed substation site. A low population is also considered likely to be present in suitable habitat within the tenant relocation area. Slow-worm was only recorded in Pegwell Bay Country Park where the numbers indicate a low population.
- 5.10.88 Populations in Pegwell Bay Country Park, Stonelees Nature Reserve and Baypoint Sports Club have the potential to be affected by temporary habitat loss and accidental killing/ injuring during construction whilst populations within the proposed substation site have the potential to be affected by permanent habitat loss as well as accidental killing/ injuring. The ephemeral/ short perennial habitat within the proposed tenant relocation area will be retained and significant effects on viviparous lizard are not anticipated there. Reptiles are not likely to be subject to significant noise and vibration or visual disturbance, nor is the low level of lighting proposed during construction likely to cause disturbance to reptiles. The assessment therefore focusses on permanent and temporary habitat loss and accidental killing/ injuring.

Permanent Habitat Loss

- 5.10.89 A total of approximately 2.4 ha of ephemeral/ short perennial habitat could be permanently lost within the substation site, although most of this area is not suitable for viviparous lizard with suitable habitat effectively restricted to the periphery of the site where the habitat is better established.
- 5.10.90 Embedded mitigation includes the retention and management of an area of 0.4 ha on the eastern side of the substation site. This area would be managed to enhance its value to lizards and invertebrates.
- 5.10.91 Following the implementation of embedded mitigation measures the permanent loss of ephemeral/ short perennial habitat is considered unlikely to adversely affect the conservation status of viviparous lizard at the site and is not predicted to be significant.

Temporary Habitat Loss/ Disturbance

- 5.10.92 Approximately 4.01 ha of scrub, semi-improved neutral grassland and broad-leaved woodland habitat would be temporarily lost/ disturbed within Pegwell Bay Country Park; 1.05 ha of similar habitat would be temporarily affected within Stonelees Nature Reserve; and 1.35 ha would be affected within the Baypoint Sports Club site (although most of this is amenity grassland of negligible value to reptiles). All of the affected habitat types are widespread in areas outside the RLB and the affected areas represent a relatively small proportion of the suitable habitat for reptiles within the wider study area. As part of the embedded mitigation terrestrial habitats would all be reinstated or restored as soon as possible following completion of the works.
- 5.10.93 Following the implementation of embedded mitigation measures the temporary loss of habitat/ disturbance to habitats occupied by reptiles is considered unlikely to adversely affect the conservation status of the local reptile population. **No significant effect is therefore predicted.**

Accidental Killing/ Injuring

- 5.10.94 Embedded mitigation measures would be implemented to avoid the accidental killing or injuring of viviparous lizard and slow-worm. As set out in Table 5.11 these would involve the management of vegetation to discourage occupation by reptiles and the identification/removal of potential refugia and hibernacula (if present) prior to construction works taking place in the relevant area.
- 5.10.95 Following the implementation of embedded mitigation measures the risk of accidental killing or injuring of individual reptiles would be low and therefore contravention of the relevant legislation is unlikely. **As such no significant adverse effects are predicted in relation to the accidental killing or injuring of reptiles during construction.**

Breeding birds – Schedule 1 species

- 5.10.96 Four species included on Schedule 1 of the Wildlife & Countryside Act 1981 (as amended) were recorded breeding, or considered likely to be breeding, within the study area in 2017: peregrine falcon, marsh harrier, kingfisher and Cetti's warbler.
- 5.10.97 Of these species only one, Cetti's warbler, bred within the RLB. Habitat loss is therefore considered in relation to Cetti's warbler only. All four species are considered in respect of potential disturbance whilst nesting.

Permanent Habitat Loss

- 5.10.98 The only permanent loss of habitat will take place at the substation site, at the new access into Baypoint Sports Club and at the landfall (under option 2 for the landfall). **None of these areas are suitable for Cetti's warbler, whether for nesting or foraging and no significant effect is therefore predicted in relation to permanent habitat loss.**

Temporary Habitat Loss/ Disturbance

- 5.10.99 Scrub habitat within Pegwell Bay Country Park and Stonelees Nature Reserve is suitable for Cetti's warbler and territories were recorded in these areas during surveys in 2017. Up to 5.06 ha of grassland, scrub and woodland habitat could be temporarily lost or disturbed in these areas, although the extent of this area which is suitable for Cetti's warbler is relatively small and similar habitat is widespread in areas outside the RLB. As part of the embedded mitigation terrestrial habitats would be reinstated or restored as soon as possible following completion of the works. **The temporary loss of habitat represents a very small proportion of the suitable habitat within the study area and following the implementation of embedded mitigation is not predicted to be significant.**

Disturbance (Noise and Vibration, Visual, Lighting) while Nesting

- 5.10.100 Two pairs of peregrine were identified during the survey in 2017, one in a nestbox on a mast at the REP site, over 300 m from the RLB and the other over 500 m from the RLB. The site on the mast at the REP site is proposed to be relocated to facilitate the replacement of the existing wind turbine, following which it would be located over 700 m from the RLB. The potential disturbance distance for this species whilst nesting is given by Ruddock & Whitfield (2007) as 500-750 m. However, in practice the birds at the REP site are likely to be much more tolerant of human disturbance, their nest site being located in close proximity to ongoing construction works at the REP site. The other pair are also likely to have some tolerance for human disturbance given the nest location. **On that basis, disturbance to peregrine due to construction works for Thanet Extension is not likely to be significant.**

- 5.10.101 A single pair of marsh harrier attempted to breed at one location within the ornithological study area in 2017 and breeding may have been attempted at a second site just south of the study area. Both locations are more than 500 m from the RLB. The potential disturbance distance for this species whilst nesting is given by Ruddock & Whitfield (2007) as 300-500 m. **On that basis, disturbance to marsh harrier due to construction works is not likely to be significant.**

- 5.10.102 Although the nest site was not located kingfisher is considered to have bred somewhere along the River Stour, to the west of the REP site, in both 2016 and 2017. There is no published information regarding disturbance distances for nesting kingfisher, although disturbance is only considered likely in relatively close proximity to the nest. Given the nest site is located beyond the RLB, on the far side of ongoing construction works at the REP site, disturbance due to construction works for Thanet Extension is unlikely. Embedded mitigation includes surveys for Schedule 1 species prior to and during construction (as required). In the unlikely event that a kingfisher nest was located in closer proximity to proposed construction works a disturbance-free buffer zone would be implemented by the ECoW around the nest. **On the basis of the above, contravention of the relevant legislation is unlikely and disturbance to kingfisher due to construction works is not likely to be significant.**

- 5.10.103 46 Cetti's warbler territories were reported to be present within the ornithological study area in 2017, of which 16 were inside the RLB or within circa 50 m, although it is considered this figure could represent an over-estimate. There is no published information regarding disturbance distances for nesting Cetti's warbler, although disturbance is only considered likely in relatively close proximity to the nest. Embedded mitigation includes surveys for Schedule 1 species prior to and during construction (as required). Disturbance-free buffer zones would be implemented by the ECoW around any Cetti's warbler nests identified. **Following the implementation of embedded mitigation measures, contravention of the relevant legislation is unlikely and disturbance to Cetti's warbler due to construction works is not likely to be significant.**

Breeding birds – turtle dove and nightingale

5.10.104 A total of two turtle dove territories were located within the RLB plus 100 m buffer, both in Stonelees Nature Reserve. Six nightingale territories were located within the RLB plus 100 m buffer. Scrub and woodland habitat within Pegwell Bay Country Park and Stonelees Nature Reserve could be suitable for turtle dove and nightingale and territories were recorded in these areas during surveys in 2017. Up to 5.06 ha of grassland, scrub and woodland habitat could be temporarily lost or disturbed in these areas, although the extent of this area which is suitable for turtle dove or nightingale is relatively small and similar habitat is widespread in areas outside the RLB. As part of the embedded mitigation terrestrial habitats would all be reinstated or restored as soon as possible following completion of the works. **The temporary loss of habitat represents a very small proportion of the suitable habitat within the study area and following the implementation of embedded mitigation is not predicted to be significant.**

Breeding birds – other species of conservation concern

5.10.105 Several other species of conservation concern were recorded within the RLB during surveys in 2017, mostly within scrub, rank grassland or woodland habitat. Approximately 5.06 ha of scrub, semi-improved neutral grassland and woodland could be temporarily lost or disturbed during construction, although similar habitat is widespread in areas outside the RLB. As part of the embedded mitigation terrestrial habitats would all be reinstated or restored as soon as possible following completion of the works. **The temporary loss of habitat represents a very small proportion of the suitable habitat within the study area and following the implementation of embedded mitigation is not predicted to be significant.**

Breeding birds – all species (in respect of destruction of or damage to active nests only)

5.10.106 Embedded mitigation for nesting birds (all species) includes the clearance of habitat which could support nesting birds outside the main bird breeding season (March to August inclusive) or, where this is not possible, vegetation would be checked for active nests by the ECoW prior to clearance. **Following the implementation of these measures contravention of the relevant legislation is unlikely and no significant effects are predicted in terms of destruction of or damage to active nests.**

Non-breeding birds – lapwing

5.10.107 Lapwing is regularly present in Pegwell Bay in nationally important numbers with birds roosting on the mudflats and adjacent saltmarsh, primarily from October to February.

Permanent Habitat Loss

5.10.108 A total of up to 1,399 m² of saltmarsh would be permanently lost under option 2 for construction of the landfall. The saltmarsh to be lost represents upper saltmarsh, subject to tidal inundation on an infrequent basis and characterised by relatively tall (>30 cm), dense vegetation dominated by *Spartina*.

5.10.109 Like European golden plover (see paragraphs 5.10.7-5.10.9) lapwing typically feed on intertidal mudflats and agricultural land (arable and pasture), roosting on intertidal mudflats at low tide, on open saltmarsh at low and high tide and on agricultural land (arable and pasture). Like European golden plover, lapwing tends to avoid terrain in which it cannot easily run and which has poor visibility of approaching predators. The upper saltmarsh habitat to be lost does not provide suitable habitat for feeding or roosting lapwing as the vegetation is too tall and dense. The area which could be lost is also situated adjacent to a well-used footpath and therefore subject to regular disturbance which further reduces its potential value to roosting lapwing.

5.10.110 Survey data collected in winter 2016-17 (see Vol 5, Annex 5-4, Ornithology Baseline Report, Document Ref: 6.5.5.4) identified the presence of roosting lapwing in close proximity to the location of the landfall (though not within the area likely to be affected by the seawall extension itself) on two hourly counts during the November 2016 survey visit, i.e. on two out of 30 counts. There were no other records of lapwing in the immediate vicinity of the landfall during the remainder of the winter 2016-17 surveys. As noted for European golden plover mapping the location of flocks of waterbirds in the field is subject to a relatively high degree of error and in reality it is considered likely that these birds were actually using the more open saltmarsh, further to the east of the area which could be affected by the seawall extension, where the habitat is more suitable for them. Even in the unlikely event that small numbers of birds were using the unsuitable upper saltmarsh habitat on this occasion, the very low number of birds affected and the infrequency of use indicates that the level of usage is not significant.

5.10.111 A total of up to 4.1 ha of hardstanding and ephemeral/ short perennial vegetation, outside the SPA, could be permanently lost during construction of the substation. Lapwing was not recorded in this area during transect surveys of terrestrial habitats in winter 2016-17 and the habitat at the substation site, which is currently used for vehicle storage, is not likely to be of value to lapwing under its current landuse.

5.10.112 There will therefore be no permanent loss of intertidal or terrestrial habitat used by non-breeding lapwing and no significant effect is predicted in relation to permanent habitat loss.

Temporary Habitat Loss/ Disturbance

5.10.113 The temporary loss/ disturbance of intertidal habitats used by non-breeding waterbirds was discussed above in relation to the Thanet Coast and Sandwich Bay SPA and Sandwich Bay to Hacklinge Marshes SSSI. As for the designated site qualifying features, adverse effects on lapwing resulting from temporary loss or disturbance of intertidal habitat will be of short-term duration (maximum two years for saltmarsh but much less for mudflats) and will extend across a very small proportion of the available intertidal habitat.

5.10.114 None of the terrestrial habitats within the RLB are potentially suitable for lapwing and there will therefore be no temporary loss or disturbance of terrestrial habitat used by non-breeding lapwing.

5.10.115 No significant effect is therefore predicted in terms of temporary habitat loss/ disturbance, either in terms of intertidal or terrestrial habitats.

Disturbance (Noise and Vibration, Visual, Lighting)

5.10.116 Peak lapwing numbers at Pegwell Bay occur during the period October to February with much lower numbers recorded outside this period. As discussed in relation to the SPA and SSSI, embedded mitigation has been included to avoid disturbance to non-breeding waterbirds using intertidal habitats during the period October to March inclusive. The implementation of the embedded mitigation would avoid significant disturbance to non-breeding lapwing. **No significant effect on lapwing is therefore predicted in terms of disturbance.**

Disturbance due to Possible Displacement of Recreational Users from Pegwell Bay Country Park

5.10.117 An assessment of potential disturbance effects of possible displacement of recreational users from Pegwell Bay Country Park was presented in relation to the SPA and is not repeated here. Taking into account the low likelihood of visitor displacement, the location of the sites which visitors are most likely to be displaced to and the embedded mitigation, that assessment concluded that no significant effect on the SPA qualifying species was likely. **The same conclusion, i.e no significant effect, also applies to lapwing which are present at similar times of year to the SPA qualifying species.**

Non-breeding birds – other waterbird species

5.10.118 A number of non-breeding waterbird species are regularly present in Pegwell Bay in numbers of county importance. Some of these species could potentially be affected by the permanent and temporary loss of intertidal habitat and disturbance during construction.

Permanent Habitat Loss

5.10.119 A total of up to 1,399 m² of saltmarsh would be permanently lost under option 2 for construction of the landfall. No waterbirds were recorded using this area during surveys in winter 2016-17. Furthermore, this area, which comprises an area of upper saltmarsh, adjacent to a well-used footpath is considered very unlikely to be used by significant numbers of waterbirds, even on an occasional basis. **There will therefore be no permanent loss of intertidal habitat used by non-breeding waterbirds and no significant effect is predicted in relation to permanent habitat loss.**

Temporary Habitat Loss/ Disturbance

5.10.120 The temporary loss/ disturbance of intertidal habitats was discussed above in relation to the lapwing. As for lapwing, adverse effects on other waterbird species resulting from temporary loss or disturbance of intertidal habitat will be of short-term duration (maximum two years for saltmarsh but much less for mudflats) and will extend across a very small proportion of the available intertidal habitat. **No significant effect is therefore predicted in terms of temporary habitat loss/ disturbance.**

Disturbance (Noise and Vibration, Visual, Lighting)

5.10.121 Peak numbers of most waterbird species at Pegwell Bay occur during the period October to March, although this is not the case for all species, e.g. some passage waders, terns and some gull species. As discussed previously, embedded mitigation has been included to avoid disturbance to non-breeding waterbirds using intertidal habitats during the period October to March inclusive. Whilst this won't benefit those species using Pegwell Bay at other times, negative effects due to disturbance are likely to be greatest during winter due to colder temperatures and shorter day length. The implementation of the embedded mitigation would therefore avoid significant disturbance to waterbird species at the time when they are most susceptible to negative effects resulting from disturbance. **No significant effects are therefore predicted in terms of disturbance.**

Disturbance due to Possible Displacement of Recreational Users from Pegwell Bay Country Park

5.10.122 As for lapwing, following the implementation of embedded mitigation, no significant effect on other non-breeding waterbird species is likely in relation to the possible displacement of recreational users from Pegwell Bay Country Park.

Bats

5.10.123 Both habitat loss (permanent and temporary) and disturbance are considered in relation to bats. Potential effects are considered in respects of roosts and foraging/ commuting habitat.

Permanent Habitat Loss

- 5.10.124 A small number of trees will be felled to enable cabling works to take place. However, no roosts have been recorded within the RLB and embedded mitigation is proposed which includes appropriate precautions when felling any trees identified as having low potential to support bat roosts, in accordance with current BCT guidelines (Collins, 2016) and BS8596-2015.
- 5.10.125 The only area of terrestrial habitat which will be permanently lost is at the proposed substation site, which comprises hardstanding and ephemeral/short perennial habitat of low value to foraging bats.
- 5.10.126 On the basis of the above there will be no contravention of the relevant legislation, permanent habitat loss for bats will not be significant and a European Protected Species Licence (EPSL) will not be required.

Temporary Habitat Loss/ Disturbance

- 5.10.127 Bat activity survey data indicate that the highest levels of bat activity were associated with the woodland edge and tree line along the northern and eastern edges of the Baypoint Sports Club site and the southern end of Stonelees Nature Reserve. A small area of scrub and woodland could be temporarily lost or disturbed in these areas during construction, although similar habitat is widespread in areas outside the RLB. As part of the embedded mitigation terrestrial habitats would be reinstated or restored as soon as possible following completion of the works. **The temporary loss of habitat represents a very small proportion of suitable bat foraging habitat within the study area and following the implementation of embedded mitigation is not predicted to be significant.**
- 5.10.128 Some bat species can be affected by severance of linear features which provide important commuting routes. However, no linear features of significant value to commuting bats were identified within the study area during the surveys. Furthermore, bat activity survey data indicate that activity was dominated by pipistrelle species, which are known to regularly cross gaps of 200 m (Downs & Racey, 2006). Noctule, which were recorded relatively frequently during the surveys, are also known to fly high and regularly cross open areas (Jones, 1995). Berthinussen and Altringham (2015) suggested that woodland bat species such as horseshoes and some *Myotis* bats are most likely to be affected by the creation of gaps in commuting routes. However these species were not recorded during the surveys (horseshoe bats) or were recorded only in relatively low numbers (*Myotis* bats). **Possible habitat fragmentation impacts caused by the temporary removal of important flight corridors are therefore not predicted to be significant.**

Disturbance (Noise and Vibration, Visual, Lighting)

- 5.10.129 A small number of bat droppings were recorded at the Baypoint Sports Clubhouse, approximately 75 m from the RLB in March 2017, but no evidence of bats was recorded during a full internal inspection in November 2017. Even adopting a precautionary approach which assumes that a small roost is present here, given the intervening distance, the relatively high levels of existing use of the building and the nature of the cabling works no disturbance to the roost is likely.
- 5.10.130 With the possible exception of HDD works, which will affect a very small area, and some works at the substation construction will only take place between the hours of 07.00 and 19.00, with no lighting required when works are not taking place. Disturbance to foraging and commuting bats due to noise or lighting during construction works is therefore not likely to be significant.
- 5.10.131 On the basis of the above there will therefore be no contravention of the relevant legislation with respect to disturbance of roosting bats, any disturbance to foraging or commuting bats will not be significant and an EPSL will not be required.

Water vole

- 5.10.132 Water vole was not recorded within the RLB during surveys in 2017 and there is only one watercourse crossing proposed (the crossing of the Minster Stream within the British Car Auctions site). The widening of the existing access into the proposed construction compound from Sandwich Road lies adjacent to a ditch which supported water vole in 2014, although water vole was not recorded here in 2017. **On the basis that pollution of water-based resources is not likely to be significant following the implementation of embedded mitigation and given the current absence of water vole from the watercourses within the RLB, no effects on water vole are anticipated and no licence will be required.**
- 5.10.133 Due to the time that will have elapsed since the last surveys and the possibility that water vole activity could have changed in the intervening period, embedded mitigation includes provision for an update survey for water vole to be carried out along any ditches or other watercourses which could be affected (e.g. Minster Stream and the ditch alongside Sandwich Road), prior to construction commencing. The results of the pre-construction survey would inform the need for any mitigation measures to be included within the LEMP.

Otter

- 5.10.134 Otter was not recorded within the RLB during surveys in 2017, although there is one unconfirmed record of a possible holt along the River Stour, adjacent to the REP site. **On the basis that pollution of water-based resources is not likely to be significant following the implementation of embedded mitigation, no effects on otter are anticipated and an EPSL will not be required.**

5.10.135 Due to the time that will have elapsed since the last surveys and the possibility of otter presence along the River Stour, embedded mitigation includes provision for an update survey for otter to be carried out along the relevant section of the River Stour, prior to construction commencing. The results of the pre-construction survey would inform the need for any mitigation measures to be included in the LEMP.

5.11 Environmental Assessment: O&M Phase

5.11.1 As set out in Volume 3, Chapter 1: Project Description (Onshore) (Document Ref: 6.3.1), maintenance activities can be categorised into two levels: preventative (planned) and corrective (unplanned) maintenance. Preventative maintenance is according to scheduled services whereas unplanned corrective maintenance covers unexpected repairs, component replacements, retrofit campaigns and breakdowns.

5.11.2 The assessment presented here refers to preventative maintenance only. As set out in Table 5.10, the extent or nature of any unplanned corrective maintenance required can't be predicted at this stage and therefore possible effects relating to unplanned corrective maintenance can't be assessed. Any unplanned corrective maintenance required would be subject to the necessary consents and the development of appropriate mitigation measures, in consultation with the relevant nature conservation bodies.

5.11.3 As for construction (section 5.1) effects are assessed for each of the receptors subject to detailed assessment (see paragraph 5.7.123) in turn. Each of the potential effects listed in Table 5.10 for the O&M phase has been assessed with the exception of pollution, which following the implementation of embedded mitigation measures set out in Volume 2, Chapter 5: Benthic Subtidal and Intertidal Ecology (Document Ref: 6.2.5), Volume 3, Chapter 6: Ground Conditions, Flood Risk and Land Use (Document Ref: 6.3.6) and the CoCP (Document ref: 8.1) is not likely to be significant for any receptors. Within this chapter effects relating to permanent habitat loss are addressed under construction (section 5.1), as that is when the loss would take place, even though the effects of permanent habitat loss would continue to be felt during O&M. Effects relating to permanent habitat loss are therefore not assessed again here (note that this approach differs from the approach followed in Volume 2, Chapter 5: Benthic Subtidal and Intertidal Ecology (Document Rf: 6.2.5) in which permanent habitat loss, e.g. saltmarsh, is covered under the O&M phase). For each effect, potential impacts are characterised and the significance of the resulting effects is determined in accordance with the methodology set out in section 5.5, on the basis that the embedded mitigation measures listed in Table 5.11 are all implemented.

5.11.4 A summary of ecological receptors and potential effects subject to detailed assessment during the O&M phase is provided in Table 5.13.

Table 5.13: Ecological Receptors and Potential Effects Subject to Detailed Assessment during the O&M Phase

Receptor	Potential Effect		
	Temporary Habitat Loss/ Disturbance	Disturbance (noise & vibration, visual, lighting)	Accidental killing/ injury
Designated Sites			
Thanet Coast and Sandwich Bay SPA – Non-breeding European golden plover and ruddy turnstone	✓	✓	n/a
Thanet Coast and Sandwich Bay Ramsar – non-breeding ruddy turnstone	✓	✓	n/a
Thanet Coast and Sandwich Bay Ramsar – wetland invertebrate assemblage	✓	n/a	n/a
Sandwich Bay and Hacklinge Marshes SSSI – aggregations of non-breeding birds	✓	✓	n/a
Sandwich Bay and Hacklinge Marshes SSSI – assemblage of breeding birds	✓	✓	n/a

Receptor	Potential Effect		
	Temporary Habitat Loss/ Disturbance	Disturbance (noise & vibration, visual, lighting)	Accidental killing/ injury
Sandwich Bay and Hacklinge Marshes SSSI – invertebrate assemblage	✓	n/a	n/a
Sandwich and Pegwell Bay NNR (receptors not covered elsewhere in assessment)	✓	n/a	n/a
Ash Level and South Richborough Pasture LWS	n/a	n/a	n/a
A256 (Sandwich Road) Roadside Nature Reserve	n/a	n/a	n/a
Sandwich and Pegwell Bay KWTR	n/a – covered under Sandwich and Pegwell Bay NNR		
Habitats/ Vegetation			
Semi-improved grazing marsh pasture to the east and southwest of the RLB	n/a	n/a	n/a
Ephemeral pools in Stonelees Nature Reserve	✓	n/a	n/a

Receptor	Potential Effect		
	Temporary Habitat Loss/ Disturbance	Disturbance (noise & vibration, visual, lighting)	Accidental killing/ injury
River Stour	n/a	n/a	n/a
Ephemeral/ short perennial habitats within the proposed substation site and tenant relocation area	✓	n/a	n/a
Invasive non-native plant species	n/a – effects considered in relation to inadvertent spreading of species only		
Faunal Species (where not included as qualifying or notified features for designated sites)			
Terrestrial invertebrates – outside designated sites	✓	n/a	n/a
Reptiles – slow-worm and viviparous lizard	✓	n/a	✓
Breeding birds – Schedule 1 species	✓	✓	✓
Breeding birds – turtle dove and nightingale	✓	n/a	✓ (in respect of birds and active nests)
Breeding birds – other species of conservation concern	✓	n/a	✓ (in respect of birds and active nests)

Receptor	Potential Effect		
	Temporary Habitat Loss/ Disturbance	Disturbance (noise & vibration, visual, lighting)	Accidental killing/ injury
Breeding birds – all other species	n/a	n/a	✓ (in respect of birds and active nests)
Non-breeding birds – lapwing	✓	✓	n/a
Non-breeding birds – other waterbird species	✓	✓	n/a
Bats	✓	✓	✓
Water vole	n/a – not likely to be affected based on current survey data		
Otter	n/a – not likely to be affected based on current survey data		

Thanet Coast and Sandwich Bay SPA

European Golden Plover and Ruddy Turnstone (Non-breeding)

Temporary Habitat Loss/ Disturbance

- 5.11.5 The extent of intertidal habitat that could be affected by temporary loss/ disturbance during preventative maintenance is not known but is likely to be very small.
- 5.11.6 As set out in section 5.1 there is no suitable terrestrial habitat for European golden plover or ruddy turnstone within the RLB and therefore there will be no temporary loss or disturbance to terrestrial habitats for the qualifying features during preventative O&M works.
- 5.11.7 On the basis of the above, none of the conservation objectives for the SPA will be undermined. No significant effect on European golden plover or ruddy turnstone is therefore predicted in terms of temporary habitat loss/ disturbance.

Disturbance (Noise and Vibration, Visual, Lighting)

- 5.11.8 Embedded mitigation has been included that would involve a timing restriction on all preventative maintenance works within the intertidal and at the shoreline, as during construction. **This would prevent any works taking place in these areas during the period October to March inclusive and would therefore avoid significant disturbance to non-breeding European golden plover and ruddy turnstone using intertidal habitats.**
- 5.11.9 Noise arising from the operation of the substation transformers (which operate 24 hours a day) is assessed, in respect of human receptors, in Volume 3, Chapter 10: Noise and Vibration. Noise from the transformers will be relatively constant with predicted noise levels at the closest human receptor (Stonar Cottage), approximately 500 m from the substation, of 36 DB L_{Aeq,Tr}. Based on Cutts *et al.* (2009) noise at these levels is not likely to have any effect on non-breeding waterbirds. Furthermore, the mudflats within Pegwell Bay, which are the closest areas supporting significant numbers of European golden plover and ruddy turnstone, are over 1 km away and noise levels are therefore likely to be substantially lower than those predicted at Stonar Cottage. **No significant effect is therefore predicted in respect of operational noise from the substation.**

Thanet Coast and Sandwich Bay Ramsar

Ruddy Turnstone (Non-breeding)

- 5.11.10 An assessment of potential effects on ruddy turnstone is presented above in respect of the Thanet Coast and Sandwich Bay SPA and is not repeated here. **In conclusion, following the implementation of embedded mitigation measures no significant effects on ruddy turnstone are predicted during the O&M phase.**

Wetland Invertebrate Assemblage

Temporary Habitat Loss/ Disturbance

- 5.11.11 The extent of any temporary habitat loss or disturbance within Stonelees Nature Reserve during preventative O&M works would be negligible. Under the terrestrial invertebrate mitigation strategy, measures would be incorporated (if necessary) to ensure that preventative O&M works avoid disturbance to habitats known to be occupied by wetland invertebrate assemblage species. **No significant effect on the Ramsar wetland invertebrate assemblage is therefore predicted during O&M.**

Sandwich Bay to Hacklinge Marshes SSSI

Aggregations of Non-breeding Birds

Temporary Habitat Loss/ Disturbance

5.11.12 The temporary loss or disturbance of intertidal habitats during O&M was discussed above in relation to the Thanet Coast and Sandwich Bay SPA. The extent of intertidal habitat that could be affected by temporary loss/ disturbance during preventative maintenance is not known but is likely to be very small. **No significant effect on any of the notified non-breeding wader species is therefore predicted.**

Disturbance (Noise and Vibration, Visual, Lighting)

5.11.13 As discussed in relation to the SPA, embedded mitigation has been included that would involve a timing restriction on all preventative maintenance works within the intertidal and at the shoreline. This would avoid significant disturbance to non-breeding grey plover and sanderling. **No significant effect on grey plover and sanderling is therefore predicted in terms of disturbance.**

5.11.14 Peak numbers of ringed plover at Sandwich Bay occur during the spring and autumn passage periods and they won't therefore benefit from the proposed timing restrictions. Negative effects due to disturbance are likely to be greatest during winter due to colder temperatures and shorter day length however, with disturbance having a comparatively lower impact at other times of year. Nevertheless, as discussed in respect of construction, some negative effects due to disturbance are still possible at these times.

5.11.15 As set out in respect of construction, at this stage it is not known whether the cable route will pass through the main areas favoured by passage ringed plover. If the cable route avoids these areas (plus a buffer of up to 250 m) no disturbance effects are likely during preventative (planned) maintenance work. However, a precautionary approach has been adopted here which assumes that the cable route could be located within these areas (or within 250 m of these areas). Under this scenario some disturbance is possible during preventative (planned) maintenance work.

5.11.16 The likelihood that disturbance resulting from the proposed development could result in a significant effect was discussed in relation to construction. Preventative (planned) maintenance works are likely to result in less disturbance than construction. Nevertheless, displacement is still possible, e.g. if works happened to coincide with the day(s) when peak numbers of ringed plover are present. **A significant negative effect on a receptor of national importance is therefore possible, albeit unlikely.**

5.11.17 As for construction, as a precaution additional mitigation is proposed (see section 5.15) which would be implemented if: the final cable route passes within 250 m of the favoured areas for passage ringed plover. If the final routing does not pass within 250 m of the favoured areas no additional mitigation will be required.

5.11.18 Noise arising from the operation of the substation transformers was assessed in relation to the SPA and the same conclusions apply to non-breeding grey plover, sanderling and ringed plover.

Assemblage of Breeding Birds – Lowland Open Waters and their Margins

Temporary Habitat Loss/ Disturbance

5.11.19 The temporary loss or disturbance of intertidal habitats during preventative O&M works will be very small and the temporary loss or disturbance of terrestrial habitats will be negligible. **Temporary loss or disturbance of habitat is therefore not likely to have a significant effect on the SSSI breeding bird assemblage.**

Disturbance (Noise and Vibration, Visual, Lighting) and Damage to/ Destruction of Nests

5.11.20 Embedded mitigation will be implemented to avoid damage to, or destruction of nests and to avoid disturbance to the nests of species likely to be particularly sensitive to disturbance, e.g. redshank during preventative maintenance (see Table 5.11). **No significant effect on the SSSI breeding bird assemblage is therefore predicted in terms of disturbance.**

Invertebrate Assemblage

Temporary Habitat Loss/ Disturbance

5.11.21 The extent of any temporary habitat loss or disturbance within the SSSI during preventative O&M works would be negligible. Under the terrestrial invertebrate mitigation strategy, measures would be incorporated (if necessary) to ensure that preventative O&M works avoid disturbance to habitats known to be occupied by SSSI invertebrate assemblage species. **No significant effect on the SSSI invertebrate assemblage is therefore predicted during O&M.**

Sandwich and Pegwell Bay NNR

5.11.22 The temporary loss or disturbance of intertidal habitats during preventative O&M works will be very small and the temporary loss or disturbance of terrestrial habitats will be negligible. **Temporary loss or disturbance of habitat is therefore not likely to have a significant effect on the NNR.**

Non-Statutory Sites

Ash Level and South Richborough Pasture LWS

5.11.23 The LWS is located outside the RLB and will not be affected by preventative maintenance during the O&M phase.

Roadside Nature Reserve A256 (Sandwich Road)

5.11.24 The Roadside Nature Reserve is situated away from cable routes and other infrastructure which will be subject to inspection. **The Roadside Nature Reserve will therefore not be affected by preventative maintenance during the O&M phase.**

Sandwich and Pegwell Bay KWTR

5.11.25 This reserve forms part of Sandwich and Pegwell Bay NNR and is therefore covered under the assessment for the NNR.

Habitats

Semi-improved Grazing Marsh Pasture

5.11.26 Semi-improved grazing marsh pasture is located outside the RLB and will therefore not be affected by preventative maintenance during the O&M phase.

Standing Water – Ephemeral Pools in Stonelees Nature Reserve

5.11.27 The extent of any temporary habitat loss or disturbance to terrestrial habitats during preventative O&M works would be negligible. Embedded mitigation will be implemented to avoid inadvertent damage to retained habitats of importance during preventative maintenance (see Table 5.11). **No significant effect is therefore predicted in relation to standing water habitats during the O&M phase.**

Running Water – River Stour

5.11.28 The River Stour is located outside the RLB and will not be affected by preventative maintenance during the O&M phase.

Ephemeral/ Short Perennial Vegetation

5.11.29 The extent of any temporary habitat loss or disturbance to terrestrial habitats during preventative O&M works would be negligible. Embedded mitigation will be implemented to avoid inadvertent damage to retained and created habitats of importance during preventative maintenance (see Table 5.11). **No significant effect is therefore predicted in relation to ephemeral/ short perennial habitats during the O&M phase.**

Invasive Non-native Species

5.11.30 Embedded mitigation will be implemented to avoid the inadvertent spread of invasive non-native species during preventative maintenance (see Table 5.11). **No significant effects are therefore predicted in respect of invasive non-native species during the O&M phase.**

Faunal Species (where not included as qualifying or notified features for designated sites)

Terrestrial invertebrates

5.11.31 The extent of any temporary habitat loss or disturbance to terrestrial habitats during preventative O&M works will be negligible. Under the terrestrial invertebrate mitigation strategy, measures would be incorporated (if necessary) to ensure that preventative O&M works avoid disturbance to habitats known to be occupied by important invertebrate species. **No significant effect on terrestrial invertebrates is therefore predicted during O&M.**

Reptiles – slow-worm and viviparous lizard

5.11.32 The extent of any temporary habitat loss or disturbance to terrestrial habitats during preventative O&M works will be negligible. Embedded mitigation will be implemented to avoid accidental killing or injuring of reptiles during preventative maintenance (see Table 5.11). **No significant effect on reptiles is therefore predicted during O&M.**

Breeding birds – Schedule 1 species

5.11.33 The extent of any temporary habitat loss or disturbance to terrestrial habitats during preventative O&M works will be negligible. Embedded mitigation will be implemented to avoid disturbance to nesting Schedule 1 bird species during preventative maintenance (see Table 5.11). **No significant effects on Schedule 1 birds are therefore predicted during O&M.**

Breeding birds – turtle dove and nightingale and other species of conservation concern

5.11.34 The extent of any temporary habitat loss or disturbance during preventative O&M works will be negligible. No significant effects are predicted in relation to breeding birds of conservation concern during the O&M phase.

Breeding birds – all species (in respect of destruction of or damage to active nests only)

5.11.35 Embedded mitigation will be implemented to avoid destruction of or damage to active nests (all species) during preventative maintenance (see Table 5.11). **No significant effects on breeding birds in respect of destruction or damage to active nests are predicted.**

*Non-breeding birds – lapwing**Temporary Habitat Loss/ Disturbance*

5.11.36 The extent of intertidal habitat that could be affected by temporary loss/ disturbance during preventative maintenance is not known but is likely to be very small. **No significant effect on non-breeding lapwing is therefore predicted.**

Disturbance (Noise and Vibration, Visual, Lighting)

5.11.37 As discussed previously, embedded mitigation has been included that would involve a timing restriction on all preventative maintenance works within the intertidal and at the shoreline. **This would avoid significant disturbance to non-breeding lapwing and no significant effect is therefore predicted.**

5.11.38 Noise arising from the operation of the substation transformers was assessed in relation to the SPA and the same conclusions apply to non-breeding lapwing.

*Non-breeding birds – other waterbird species**Temporary Habitat Loss/ Disturbance*

5.11.39 The extent of intertidal habitat that could be affected by temporary loss/ disturbance during preventative maintenance is not known but is likely to be very small. **No significant effect on other non-breeding waterbird species is therefore predicted.**

Disturbance (Noise and Vibration, Visual, Lighting)

5.11.40 As discussed previously, embedded mitigation has been included that would involve a timing restriction on all preventative maintenance works within the intertidal and at the shoreline. Whilst this won't benefit those species using Pegwell Bay at other times, negative effects due to disturbance are likely to be greatest during winter due to colder temperatures and shorter day length. The implementation of the embedded mitigation would therefore avoid significant disturbance to most waterbird species. **No significant disturbance effects on other waterbird species are therefore predicted during the O&M phase.**

5.11.41 Noise arising from the operation of the substation transformers was assessed in relation to the SPA and the same conclusions apply to other non-breeding waterbird species. **No significant effect is therefore predicted in respect of operational noise from the substation.**

Bats

5.11.42 The extent of any temporary habitat loss or disturbance to terrestrial habitats during preventative O&M works will be negligible. Embedded mitigation will be implemented to avoid potential impacts on protected species, including bats, during preventative maintenance (see Table 5.11). **No significant effect on bats is therefore predicted during O&M and no EPSL will be required.**

Water vole

5.11.43 Freshwater aquatic habitats will not be affected by preventative O&M works and therefore there will be no effects on water vole, even if present and no licence will be required.

Otter

5.11.44 Freshwater aquatic habitats will not be affected by preventative O&M works and therefore there will be no effects on otter, even if present and no EPSL will be required.

5.12 Environmental Assessment: Decommissioning Phase

5.12.1 Impacts from decommissioning are expected to be similar to those for construction but over a reduced timescale and affecting a smaller area since the assets are already *in situ*.

5.12.2 Embedded mitigation measures implemented in the decommissioning phase are likely to be similar to those implemented during the construction phase. Embedded mitigation would be based on update ecological survey data and would adhere to relevant legislation and good practice guidelines in place at the time of decommissioning.

5.12.3 The predicted effects of decommissioning (assuming that there has been no significant alteration in the environmental conditions within or adjacent to the RLB) are therefore considered to be the same or less than those predicted for the construction phase. **Following the implementation of embedded mitigation measures no effects are considered likely to be significant during the decommissioning phase.**

5.13 Environmental Assessment: Cumulative Effects**Approach**

5.13.1 Cumulative effects refer to effects upon receptors arising from Thanet Extension when considered alongside other proposed developments and activities and any other *reasonably foreseeable project(s)* proposals. In this context the term *projects* is considered to refer to any project with comparable effects and is not limited to offshore wind projects.

- 5.13.2 The approach to cumulative assessment for Thanet Extension takes into account the Cumulative Impact Assessment Guidelines issued by RenewableUK in June 2013, together with comments made in response to other renewable energy developments within the Southern North Sea, and PINS 'Advice Note 9: Rochdale Approach'. The relevant projects, the suggested tiers, and the Cumulative Impact Assessment approach conducted for Thanet Extension have been agreed with relevant stakeholders under the auspices of the EIA Evidence Plan (Document Ref: 8.5).
- 5.13.3 In assessing the potential cumulative impact(s) for Thanet Extension, it is important to bear in mind that for some projects, predominantly those 'proposed' or identified in development plans etc. may or may not actually be taken forward. There is thus a need to build in some consideration of certainty (or uncertainty) with respect to the potential impacts which might arise from such proposals. For example, relevant projects/ plans that are already under construction are likely to contribute to cumulative impact with Thanet Extension (providing effect or spatial pathways exist), whereas projects/ plans not yet approved or not yet submitted are less certain to contribute to such an impact, as some may not achieve approval or may not ultimately be built due to other factors.
- 5.13.4 For this reason, all relevant projects/ plans considered cumulatively alongside Thanet Extension have been allocated into 'Tiers', reflecting their current stage within the planning and development process. This allows the cumulative impact assessment to present several future development scenarios, each with a differing potential for being ultimately built out. Appropriate weight may therefore be given to each scenario (Tier) in the decision-making process when considering the potential cumulative impact associated with Thanet Extension (e.g. it may be considered that greater weight can be placed on the Tier 1 assessment relative to Tier 2).
- 5.13.5 The projects and plans selected as relevant to the assessment of impacts to onshore biodiversity are based upon an initial screening exercise undertaken on a long list. Each project, plan or activity has been considered and scoped in or out on the basis of effect–receptor pathway, data confidence and the temporal and spatial scales involved. The shortlist of other developments to be considered for cumulative effects is presented in Volume 1, Chapter 3: Cumulative Impact Assessment – Methodology and Project List (Document Ref: 6.1.3.1). As well as consideration of onshore projects, the cumulative impact assessment for onshore biodiversity also includes consideration of offshore projects which have potential to affect intertidal habitats used by non-breeding waterbirds.
- 5.13.6 The proposed tier structure that is intended to ensure that there is a clear understanding of the level of confidence in the cumulative assessments provided in the Thanet Extension ES is as follows:

Tier 1

- 5.13.7 Thanet Extension considered alongside other projects/ plans currently under construction and/ or those consented but not yet implemented, and/ or those submitted but not yet determined where data confidence for the projects falling within this category is high.
- 5.13.8 Built and operational projects will be included within the cumulative assessment where they have not been included within the environmental characterisation surveys, i.e. they were not operational when baseline surveys were undertaken, and/ or any residual impact may not have yet fed through to and been captured in estimates of 'baseline' conditions or there is an ongoing effect.

Tier 2

- 5.13.9 All projects included in Tier 1 plus other projects/ plans consented but not yet implemented and/ or submitted applications not yet determined where data confidence for the projects falling into this category is medium.

Tier 3

- 5.13.10 The above plus projects on relevant plans and programmes (the PINS Programme of Projects or other appropriate planning portal sources being the most relevant sources for this assessment). Specifically, all projects where the developer has advised PINS in writing that they intend to submit an application in the future were considered.

Scope of the Cumulative Assessment

- 5.13.11 The potential for cumulative effects has been considered for each of the ecological receptors and potential effects set out in Table 5.14 and Table 5.15. Table 5.14 and Table 5.15 provide a summary of ecological receptors and potential effects subject to detailed assessment during the construction and O&M phases respectively.
- 5.13.12 For the ecological receptors and potential effects set out in Table 5.14 and Table 5.15, the following types of other development have the potential to result in cumulative effects:
- Other developments that could result in loss or change (permanent and/ or temporary) to qualifying or notified habitats within designated sites, which could potentially also be affected by Thanet Extension.
 - Other developments that could result in loss or change (permanent and/ or temporary) to habitats used by qualifying or notified faunal species for designated sites, which could potentially also be affected by Thanet Extension. This could include developments affecting habitats located outside designated site boundaries (i.e. functionally linked habitats);

- Other developments that could result in loss or change (permanent and/ or temporary) to important habitats (where not included as qualifying or notified features for designated sites), which could potentially also be affected by Thanet Extension.
- Other developments that could result in loss or change (permanent and/ or temporary) to habitats used by important faunal species populations (where not included as qualifying or notified features for designated sites), which could potentially also be affected by Thanet Extension.
- Other developments that could result in disturbance to qualifying or notified faunal species for designated sites, which could potentially also be affected by Thanet Extension. This could include developments causing disturbance to qualifying or notified species whilst using functionally linked habitats outside the designated themselves;
- Other developments that could result in disturbance to important faunal species populations (where not included as qualifying or notified features for designated sites), which could potentially also be affected by Thanet Extension;
- Other developments that could result in the displacement of recreational users into areas where they could cause disturbance to non-breeding waterbirds, including qualifying or notified faunal species for designated sites, which could potentially also be affected by Thanet Extension; and
- Other developments that could result in accidental killing or injury to important faunal species populations, including qualifying or notified faunal species for designated sites, which could potentially also be affected by Thanet Extension.

5.13.13 On the basis of the above, the specific projects scoped into this cumulative impact assessment, and the tiers into which they have been allocated are presented in Table 5.14.

Table 5.14: Projects for cumulative assessment

Development type	Project	Status	Data confidence assessment/ phase	Tier
Biomass combined heat and power (CHP) plant	Biomass CHP Plant, Discovery Park, Sandwich	In construction	High - Third party project details published in the public domain.	Tier 1
Mixed use development	Mixed use development, Discovery Park, Sandwich	Consented	High - Third party project details published in the public domain.	Tier 1
Transmission connection between Richborough and Canterbury	Richborough Connection Project	DCO granted	High - Third party project details published in the public domain.	Tier 1
Transmission connection – cabling and substation	Nemo Link	In construction	High - Third party project details published in the public domain.	Tier 1
Airport	Manston Airport Upgrading and Re-opening	Application submitted in April 2018 but withdrawn in May 2018	Low – limited project details in the public domain	Tier 3

5.13.14 All other developments included in the shortlist of other developments (Volume 1, Chapter 3: Cumulative Impact Assessment – Methodology and Project List (Document Ref: 6.1.3.1)) have been scoped out of the cumulative assessment for onshore biodiversity. The primary reason for scoping out other developments is their distance from the RLB and/ or from the relevant designated sites. Further details are provided below:

- Non-breeding waterbirds, including qualifying and notified features for designated sites: Projects located >250 m from habitat used by non-breeding waterbirds are not likely to have a direct cumulative effect on these species so have been scoped out. Most suitable habitat for non-breeding waterbirds is located within designated sites, although certain species, e.g. European golden plover and lapwing also use non-designated grassland and arable habitats in the surrounding area for foraging. The location of any such functionally linked habitat has been determined through consideration of survey information submitted for other developments and the results of a survey of European golden plover carried out during the winter of 2016/2017 (Sutherland, 2017).
 - Other qualifying and notified features for designated sites: It is assumed that notified habitats and the qualifying or notified populations of other species are effectively restricted to the areas within the relevant designated sites. Other developments with the potential to have a cumulative effect on these qualifying or notified features would generally therefore have to be located within very close proximity to the relevant designated sites, i.e. within *circa* 200 m to allow for consideration of impacts due to dust deposition. Other developments beyond 200 m from the relevant designated sites have therefore been scoped out.
 - Important habitats (not included as qualifying or notified features for designated sites): Other developments with the potential to have cumulative effects on important habitats would generally have to be located within very close proximity to the relevant habitats, i.e. within *circa* 200 m to allow for consideration of impacts due to dust deposition. Other developments beyond 200 m from the RLB have therefore been scoped out.
 - Important faunal species (not including non-breeding waterbirds or other qualifying or notified features for designated sites): The distances at which other developments could potentially give rise to cumulative effects on important faunal species will vary by species. Most faunal species are not likely to be affected by Thanet Extension beyond 500 m from the RLB with many species only likely to be affected at much smaller distances. Other developments with the potential to have cumulative effects on important faunal species would therefore have to be located within 500 m of the relevant receptors. Other developments beyond 1 km from the RLB have therefore been scoped out.
 - It is recognised that increased recreational pressure resulting from new residential development could potentially result in disturbance impacts to non-breeding waterbirds forming qualifying or notified features for designated sites. In response to this TDC has produced a Strategic Access Management & Monitoring Plan (SAMM) in respect of the Thanet Section of the Thanet Coast & Sandwich Bay SPA. Under the SAMM residential development within 6 km of the SPA is expected to make financial contributions to the implementation of the SAMM in order to mitigate potential disturbance to SPA qualifying features from increased recreational pressure. For the purposes of this cumulative assessment it is assumed that developer contributions to the SAMM will effectively mitigate possible indirect effects resulting from increased recreational pressure thus avoiding potential cumulative effects. Residential development within the TDC administrative area that is not likely to have a direct effect on SPA qualifying features has therefore been scoped out of the cumulative assessment.
 - Cumulative effects on non-breeding waterbirds, including species forming qualifying or notified features for designated sites, are also possible in respect of offshore developments which could affect intertidal habitats used by these species. Cumulative effects on intertidal habitats are assessed in Volume 2, Chapter 5: Benthic Subtidal and Intertidal Ecology (Document Ref: 6.2.5). No significant cumulative effects on intertidal habitats are predicted and therefore no significant cumulative effects are predicted for non-breeding waterbirds using these habitats. As such, potential cumulative effects resulting from offshore developments are not considered further in this chapter.
- 5.13.15 Table 5.15 presents the scenarios whereby Thanet Extension and the other projects listed in Table 5.14 could potentially result in cumulative effects for onshore biodiversity.

Table 5.15: Cumulative Rochdale Envelope

Impact	Scenario	Justification
Loss or change (permanent and/ or temporary) to qualifying or notified habitats within designated sites.	Cumulative effects are possible in respect of Nemo Link (construction and decommissioning only). Cumulative effects are not likely in respect of any other projects.	The onshore cable for Nemo Link passes through the same designated sites that would be affected by Thanet Extension. None of the other developments will result in loss or change to onshore qualifying or notified habitats potentially affected by Thanet Extension.
Loss or change (permanent and/ or temporary) to habitats used by qualifying or notified faunal species for designated sites.	Cumulative effects are possible in respect of Nemo Link (construction and decommissioning only). Cumulative effects are not likely in respect of any other projects based on the information available (noting that limited information is currently available in respect of Manston Airport).	The onshore cable for Nemo Link passes through the same designated sites that would be affected by Thanet Extension. None of the other developments will result in loss or change to habitat used by qualifying or notified faunal species potentially affected by Thanet Extension.
Loss or change (permanent and/ or temporary) to important habitats (where not included as qualifying or notified features for designated sites)	Cumulative effects are not likely.	None of the other developments will result in loss or change to important habitats potentially affected by Thanet Extension.
Disturbance to qualifying or notified faunal species for designated sites	Cumulative effects are possible in respect of Nemo Link (construction only) and Richborough Connection (construction, O&M and decommissioning) and the Biomass CHP Plant, Discovery Park (O&M only).	Nemo Link and Richborough Connection both pass through areas used by qualifying or notified non-breeding bird species. Cumulative effects are only likely during construction for Nemo Link, which should

Impact	Scenario	Justification
	Cumulative effects are not likely in respect of any other projects based on the information available (noting that limited information is currently available in respect of Manston Airport).	not cause any disturbance once constructed. The potential for birds to be displaced during O&M was also identified for Richborough Connection however. Construction and decommissioning of the Biomass CHP Plant is not likely to cause disturbance and cumulative effects are only likely in respect of operational noise. None of the other developments will result in disturbance to qualifying or notified faunal species potentially affected by Thanet Extension.
Disturbance to important faunal species populations (where not included as qualifying or notified features for designated sites)	Cumulative effects are possible in respect of Nemo Link and Richborough Connection during construction and decommissioning. Cumulative effects are not likely in respect of any other projects based on the information available (noting that limited information is currently available in respect of Manston Airport).	Nemo Link and Richborough Connection both pass through areas used by important faunal species, which could potentially be affected by disturbance during construction and decommissioning. None of the other developments will result in disturbance to important faunal species populations potentially affected by Thanet Extension.
Displacement of recreational users into areas where they could cause disturbance to non-breeding waterbirds, including qualifying or notified faunal	Cumulative effects are possible in respect of the Discovery Park mixed use development (construction only). Cumulative effects are not likely in respect of any other projects.	Nemo Link has the potential to displace recreational users from Pegwell Bay Country Park, like Thanet Extension. Residential development forming part of the Discovery Park scheme has the potential to increase the number of visitors to Pegwell Bay Country Park (and

Impact	Scenario	Justification
species for designated sites		therefore increase any possible displacement effect). None of the other developments will result in the displacement of recreational users from Pegwell Bay Country Park.
Accidental killing or injury to important faunal species populations	Cumulative effects are possible in respect of Nemo Link and Richborough Connection (construction only). Cumulative effects are not likely in respect of any other projects.	Nemo Link and Richborough Connection are both located in close proximity to the Thanet Extension RLB and therefore could potentially affect the same species populations. The other developments are too far from Thanet Extension to affect the same species populations.

Assessment of Cumulative Effects

Loss or change (permanent and/ or temporary) to qualifying or notified habitats within designated sites.

- 5.13.16 The onshore cable for Nemo Link passes through the same designated sites that would be affected by Thanet Extension, i.e. Sandwich and Pegwell Bay NNR (in Pegwell Bay Country Park and Stonelees Nature Reserve) and Thanet Coast and Sandwich Bay SPA/ Ramsar and Sandwich Bay to Hacklinge Marshes SSSI (Stonelees Nature Reserve only).
- 5.13.17 Although none of the habitats affected form part of the qualifying or notified interest for the SPA, Ramsar or SSSI, it is assumed that they form interest features for the NNR.
- 5.13.18 Within Stonelees Nature Reserve habitats, both projects will reinstate affected habitats (semi-improved grassland, scrub and open ground communities) as soon as possible following construction and decommissioning. **Significant cumulative effects are therefore not predicted.**

5.13.19 Within Pegwell Bay Country Park, the Nemo cable route has been restored using a chalk-capped berm, installed in 2017. At the time of writing this largely remains uncolonised by vegetation, although the aim of the restoration is for chalk grassland habitat to establish naturally on the berm over time. For Thanet Extension habitats will either be reinstated (if a buried solution is possible) or restored to species-rich grassland on a berm (see Table 5.11). The creation of a second berm would clearly affect the landform within the country park. However, following successful restoration to species-rich grassland the value of the habitats within the country park is not likely to significantly change. It is also possible that the proposed restoration could increase the value of the grassland habitats present. **Significant cumulative effects are therefore not predicted.**

Loss or change (permanent and/ or temporary) to habitats used by qualifying or notified faunal species for designated sites

- 5.13.20 The onshore cable for Nemo Link passes through the same designated sites that would be affected by Thanet Extension (see above). These habitats are not suitable for any of the non-breeding bird species forming qualifying or notified features for the designated sites, although it is possible they could support species forming part of the wetland invertebrate assemblage for Thanet Coast and Sandwich Bay Ramsar. They may also support species forming part of the invertebrate and breeding bird assemblages for the Sandwich Bay to Hacklinge Marshes SSSI.
- 5.13.21 Within Stonelees Nature Reserve habitats, both projects will reinstate affected habitats (semi-improved grassland, scrub and open ground communities) as soon as possible following construction and decommissioning. Thanet Extension also includes embedded mitigation to avoid significant effects on important habitat for terrestrial invertebrates (see Table 5.11). **Significant cumulative effects are therefore not predicted.**

Disturbance to qualifying or notified faunal species for designated sites

- 5.13.22 Cumulative disturbance effects are possible where the construction or decommissioning phases of different projects overlap or where disturbance is possible during the O&M phase.
- 5.13.23 Construction for Nemo Link is due to be completed in 2018 and has a proposed operational life of 20 years. Construction for Thanet Extension wouldn't commence until 2020 at the earliest with the project due to have an operational life of up to 40 years. There will therefore be no temporal overlap between the construction and decommissioning phases of each project. Significant disturbance during the O&M phases for each project is not likely due to the limited requirement for preventative (planned) maintenance. **Based on the above, significant cumulative effects with the Nemo Link project are not predicted.**

- 5.13.24 Construction of the Richborough Connection has the potential to cause disturbance to European golden plover forming part of the Thanet Coast and Sandwich Bay SPA population, which use some of the fields along the Richborough Connection route for foraging. If undertaken at the same time as construction of Thanet Extension there is potential for cumulative effects. No other qualifying or notified species for designated sites potentially affected by Thanet Extension will be affected by Richborough Connection. Richborough Connection has a proposed operational life of at least 80 years and therefore cumulative effects during decommissioning are not likely.
- 5.13.25 A number of embedded mitigation measures are proposed during construction of the Richborough Connection including timing restriction in sensitive areas, controls on lighting and noise and use of screening fencing. Provided these measures are implemented, given the availability of extensive alternative inland feeding habitat within the vicinity, disturbance during construction would not comprise a likely significant effect (National Grid, 2016). Embedded mitigation implemented during construction of Thanet Extension (see Table 5.11) will avoid disturbance to European golden plover using Pegwell Bay and there is no likely significant effect.
- 5.13.26 Although it is possible that cumulative effects can be greater than the effects of the two projects considered alone, in this case there is no potential for significant effects during the sensitive winter period for Thanet Extension due to the embedded mitigation proposed (timing restrictions). Significant effects outside this period are not likely. **Significant cumulative effects with the Richborough Connection project during construction and decommissioning are therefore not predicted.**
- 5.13.27 The Richborough Connection also has the potential to cause displacement of European golden plover from the fields surrounding the new 400kV line during the O&M phase. However, given the availability of extensive alternative inland foraging habitat within the wider area, operational displacement would not comprise a likely significant effect (National Grid, 2016). Embedded mitigation implemented during planned O&M works for Thanet Extension (see Table 5.11) will avoid disturbance to European golden plover using Pegwell Bay during the sensitive winter period and there is no likely significant effect. **Significant cumulative effects with the Richborough Connection project during the O&M phase are therefore not predicted.**
- 5.13.28 An assessment of the operational noise of the biomass CHP plant at Discovery Park concluded that operational noise levels would not have a significant effect on the qualifying features for the Thanet Coast and Sandwich Bay SPA and Thanet Coast and Sandwich Bay Ramsar. Similarly, operational noise from the Thanet Extension substation is not likely to have a significant effect (see section 5.11).
- 5.13.29 Although it is possible that in-combination effects could be greater than the effects of the two projects considered alone, in this case the intervening distance between the two projects (>1.5 km) and the relatively low noise levels associated with both projects means that cumulative noise will not be significant. **Significant cumulative effects with the biomass CHP project during the O&M phase are therefore not predicted.**
- Disturbance to important faunal species populations (where not included as qualifying or notified features for designated sites)*
- 5.13.30 As set out above, there will be no temporal overlap between the construction and decommissioning phases of Nemo Link and Thanet Extension and significant disturbance to faunal species during the O&M phases for each project is not likely. **Based on the above, significant cumulative effects with the Nemo Link project are not predicted.**
- 5.13.31 Construction of the Richborough Connection has the potential to cause disturbance to a number of protected and notable faunal species also present within the Thanet Extension study area including terrestrial invertebrates, reptiles, lapwing, marsh harrier, peregrine, Cetti's warbler, kingfisher, bats, water vole and otter (National Grid, 2016). If undertaken at the same time as construction of Thanet Extension there is potential for cumulative effects.
- 5.13.32 A number of embedded mitigation measures are proposed during construction of the Richborough Connection, including the implementation of various species-specific method statements to ensure compliance with relevant wildlife legislation and policy. Provided these measures are implemented significant effects are not likely. Embedded mitigation in respect of protected and notable species would also be implemented during construction of Thanet Extension (see Table 5.11) and no significant effects are likely. **Significant cumulative effects with the Richborough Connection project during construction and decommissioning are therefore not predicted.**
- 5.13.33 The Richborough Connection also has the potential to cause displacement of lapwing European golden plover from the fields surrounding the new 400kV line during the O&M phase. However, given the availability of extensive alternative inland foraging habitat within the wider area, operational displacement would not comprise a likely significant effect (National Grid, 2016). Embedded mitigation implemented during planned O&M works for Thanet Extension (see Table 5.11) will avoid disturbance to European golden plover using Pegwell Bay during the sensitive winter period and there is no likely significant effect. **Significant cumulative effects with the Richborough Connection project during the O&M phase are therefore not predicted.**

Displacement of recreational users into areas where they could cause disturbance to non-breeding waterbirds, including qualifying or notified faunal species for designated sites

5.13.34 The residential development at Discovery Park, once constructed and occupied, has the potential to increase the number of visitors to Pegwell Bay Country Park. If these additional visitors are using the country park during the construction of Thanet Extension there is potential for them to be displaced to other, more sensitive parts of the Thanet Coast and Sandwich Bay SPA and Ramsar site where they could cause disturbance to non-breeding waterbirds. A similar effect is also possible during decommissioning of Thanet Extension, although the level of any displacement is likely to be lower due to the more limited extent of the works. Whether any increase in visitor numbers will have taken place by the time of construction is not known but a precautionary approach has been taken here which assumes that an increase in visitor numbers is possible.

5.13.35 The Discovery Park development includes proposals for a range of mitigation measures to reduce the potential for disturbance to non-breeding waterbirds, including provision of 20ha open space and a contribution to wardening and monitoring at Pegwell Bay and Sandwich. Thanet Extension also includes mitigation measures to reduce the potential for disturbance (Table 5.11). Following the implementation of the mitigation measures a significant increase in disturbance is not likely. **Significant cumulative effects with the Discovery Park development are therefore not predicted.**

Accidental killing or injury to important faunal species populations

5.13.36 Although the potential for cumulative effects due to accidental killing or injury to faunal species exists during construction and decommissioning, in practice the implementation of mitigation measures to ensure compliance with relevant wildlife legislation will avoid the possibility of significant effects for any of the projects. **Significant cumulative effects are therefore not predicted.**

5.14 Inter-Relationships

5.14.1 The assessment of effects on important onshore biodiversity receptors, as presented in sections 5.1-5.13 has already taken into account the potential for multiple impacts from the proposed development affecting particular receptors. For example disturbance effects on faunal receptors resulting from noise and vibration, visual disturbance and lighting have all been assessed together. **As such, no additional inter-related effects are anticipated in respect of onshore biodiversity.**

5.15 Mitigation

5.15.1 As set out in sections 5.1 and 5.11 a significant effect on passage ringed plover, which is a notified feature for the Sandwich Bay to Hacklinge Marshes SSSI, is possible (albeit unlikely) during construction, O&M and decommissioning works.

5.15.2 If a) the final cable route passes within 250 m of the favoured areas for passage ringed plover (see Volume 5, Annex 5-14: Passage of Ringed Plover in Sandwich Bay, Document Ref: 6.5.5.14); and b) works in these areas take place during the peak passage periods (mid-April to late May and August to September inclusive); appropriate management for passage ringed plover would be developed and agreed with Natural England.

5.15.3 The appropriate management for passage ringed plover would include a range of measures, the nature of the measures depending on the extent to which passage ringed plover are likely to be affected. Examples of potentially relevant measures include: pre-construction survey so that favoured areas can be clearly demarcated; measures to minimise working areas; measures to minimise the time that people spend outside vehicles; a watching brief by a suitably qualified ECoW; and/ or cable installation by barge, avoiding low tide periods.

5.15.4 No further mitigation requirements, additional to the embedded measures set out in Table 5.11, have been identified in respect of onshore biodiversity.

5.16 Summary of Effects

5.16.1 In the absence of mitigation a significant effect is possible, albeit unlikely, in respect of passage ringed plover, a notified feature of the Sandwich Bay to Hacklinge Marshes SSSI, during the construction, O&M and decommissioning phases. However, residual effects following the implementation of the proposed mitigation measures set out in section 5.15, if required, would not be significant.

5.16.2 Following the implementation of the embedded mitigation measures, with the possible exception of ringed plover (see above), no significant effects are anticipated in relation to any other onshore biodiversity receptors during either the construction, O&M or decommissioning phases. No significant cumulative effects are predicted with other developments.

5.16.3 The conclusions of the assessment are summarised in Table 5.16. As set out in sections 5.1 and 5.11, following the implementation of embedded mitigation, effects relating to pollution (air and water-based) are not likely to be significant for any ecological receptor. Effects relating to pollution have therefore not been included in the receptor by receptor summary in Table 5.16.

Table 5.16: Summary of predicted impacts of Thanet Extension

Description of impact	Impact	Possible mitigation measures	Residual impact
Construction			
Thanet Coast and Sandwich Bay SPA – Non-breeding European golden plover and ruddy turnstone: <ul style="list-style-type: none"> • Permanent habitat loss • Temporary habitat loss/ disturbance • Disturbance (noise & vibration, visual, lighting) • Disturbance due to possible displacement of recreational users from Pegwell Bay Country Park 	Not significant following implementation of embedded mitigation measures	n/a	Not significant
Thanet Coast and Sandwich Bay Ramsar – non-breeding ruddy turnstone: <ul style="list-style-type: none"> • Permanent habitat loss • Temporary habitat loss/ disturbance • Disturbance (noise & vibration, visual, lighting) • Disturbance due to possible displacement of recreational users from Pegwell Bay Country Park 	Not significant following implementation of embedded mitigation measures	n/a	Not significant
Thanet Coast and Sandwich Bay Ramsar – wetland invertebrate assemblage: <ul style="list-style-type: none"> • Temporary habitat loss/ disturbance 	Not significant following implementation of embedded mitigation measures	n/a	Not significant
Sandwich Bay and Hacklinge Marshes SSSI – aggregations of non-breeding birds: <ul style="list-style-type: none"> • Permanent habitat loss • Temporary habitat loss/ disturbance • Disturbance (noise & vibration, visual, lighting) • Disturbance due to possible displacement of recreational users from Pegwell Bay Country Park 	Passage ringed plover: Possible significant effect if works take place in favoured areas when peak numbers of birds are present (mid-April to May and August to September inclusive). Other species: Not significant following implementation of embedded mitigation measures	Passage ringed plover mitigation plan to be produced and agreed if works take place in favoured areas at times when peak numbers of birds are present (mid-April to May and August to September inclusive). n/a	Not significant

Description of impact	Impact	Possible mitigation measures	Residual impact
Sandwich Bay and Hacklinge Marshes SSSI –assemblage of breeding birds: <ul style="list-style-type: none"> • Permanent habitat loss • Temporary habitat loss/ disturbance • Disturbance (noise & vibration, visual, lighting) 	Not significant following implementation of embedded mitigation measures	n/a	Not significant
Sandwich Bay and Hacklinge Marshes SSSI –invertebrate assemblage: <ul style="list-style-type: none"> • Permanent habitat loss • Temporary habitat loss/ disturbance 	Not significant following implementation of embedded mitigation measures	n/a	Not significant
Sandwich and Pegwell Bay NNR (receptors not covered elsewhere in assessment): <ul style="list-style-type: none"> • Temporary habitat loss/ disturbance 	Not significant following implementation of embedded mitigation measures	n/a	Not significant
A256 (Sandwich Road) Roadside Nature Reserve <ul style="list-style-type: none"> • Temporary habitat loss/ disturbance 	Not significant following implementation of embedded mitigation measures	n/a	Not significant
Ephemeral pools in Stonelees Nature Reserve <ul style="list-style-type: none"> • Permanent habitat loss • Temporary habitat loss/ disturbance 	Not significant following implementation of embedded mitigation measures	n/a	Not significant
Ephemeral/ short perennial habitats within the proposed substation site and tenant relocation area: <ul style="list-style-type: none"> • Permanent habitat loss • Temporary habitat loss/ disturbance 	Not significant following implementation of embedded mitigation measures	n/a	Not significant
Terrestrial invertebrates – outside designated sites: <ul style="list-style-type: none"> • Permanent habitat loss • Temporary habitat loss/ disturbance 	Not significant following implementation of embedded mitigation measures	n/a	Not significant
Reptiles – slow-worm and viviparous lizard:	Not significant following implementation of embedded mitigation measures	n/a	Not significant

Description of impact	Impact	Possible mitigation measures	Residual impact
<ul style="list-style-type: none"> Permanent habitat loss Temporary habitat loss/ disturbance Accidental killing/ injury 			
Breeding birds – Schedule 1 species: <ul style="list-style-type: none"> Permanent habitat loss Temporary habitat loss/ disturbance Disturbance (noise & vibration, visual, lighting) Accidental killing/ injury (in respect of active nests) 	Not significant following implementation of embedded mitigation measures	n/a	Not significant
Breeding birds – other species of conservation concern: <ul style="list-style-type: none"> Temporary habitat loss/ disturbance Accidental killing/ injury (in respect of active nests) 	Not significant following implementation of embedded mitigation measures	n/a	Not significant
Breeding birds – all other species: <ul style="list-style-type: none"> Accidental killing/ injury (in respect of active nests) 	Not significant following implementation of embedded mitigation measures	n/a	Not significant
Non-breeding birds – lapwing: <ul style="list-style-type: none"> Permanent habitat loss Temporary habitat loss/ disturbance Disturbance (noise & vibration, visual, lighting) Disturbance due to possible displacement of recreational users from Pegwell Bay Country Park 	Not significant following implementation of embedded mitigation measures	n/a	Not significant
Non-breeding birds – other waterbird species: <ul style="list-style-type: none"> Permanent habitat loss Temporary habitat loss/ disturbance 	Not significant following implementation of embedded mitigation measures	n/a	Not significant

Description of impact	Impact	Possible mitigation measures	Residual impact
<ul style="list-style-type: none"> Disturbance (noise & vibration, visual, lighting) Disturbance due to possible displacement of recreational users from Pegwell Bay Country Park 			
<p>Bats:</p> <ul style="list-style-type: none"> Permanent habitat loss Temporary habitat loss/ disturbance Disturbance (noise & vibration, visual, lighting) Accidental killing/ injury (in respect of active nests) 	Not significant following implementation of embedded mitigation measures	n/a	Not significant
O&M			
<p>Thanet Coast and Sandwich Bay SPA – Non-breeding European golden plover and ruddy turnstone:</p> <ul style="list-style-type: none"> Temporary habitat loss/ disturbance Disturbance (noise & vibration, visual, lighting) 	Not significant following implementation of embedded mitigation measures	n/a	Not significant
<p>Thanet Coast and Sandwich Bay Ramsar – non-breeding ruddy turnstone:</p> <ul style="list-style-type: none"> Temporary habitat loss/ disturbance Disturbance (noise & vibration, visual, lighting) 	Not significant following implementation of embedded mitigation measures	n/a	Not significant
<p>Thanet Coast and Sandwich Bay Ramsar – wetland invertebrate assemblage:</p> <ul style="list-style-type: none"> Temporary habitat loss/ disturbance 	Not significant following implementation of embedded mitigation measures	n/a	Not significant
<p>Sandwich Bay and Hacklinge Marshes SSSI – aggregations of non-breeding birds:</p> <ul style="list-style-type: none"> Temporary habitat loss/ disturbance Disturbance (noise & vibration, visual, lighting) 	<p>Passage ringed plover: Possible significant effect if planned maintenance works take place in favoured areas when peak numbers of birds are present (mid-April to May and August to September inclusive).</p> <p>Other species: Not significant following implementation of embedded mitigation measures</p>	Passage ringed plover mitigation plan to be produced and agreed if planned maintenance works take place in favoured areas at times when peak numbers of birds are present (mid-April to May and August to September inclusive).	Not significant

Description of impact	Impact	Possible mitigation measures	Residual impact
		n/a	
Sandwich Bay and Hacklinge Marshes SSSI –assemblage of breeding birds: <ul style="list-style-type: none"> • Temporary habitat loss/ disturbance • Disturbance (noise & vibration, visual, lighting) 	Not significant following implementation of embedded mitigation measures	n/a	Not significant
Sandwich Bay and Hacklinge Marshes SSSI –invertebrate assemblage: <ul style="list-style-type: none"> • Temporary habitat loss/ disturbance 	Not significant following implementation of embedded mitigation measures	n/a	Not significant
Sandwich and Pegwell Bay NNR (receptors not covered elsewhere in assessment): <ul style="list-style-type: none"> • Temporary habitat loss/ disturbance 	Not significant following implementation of embedded mitigation measures	n/a	Not significant
Ephemeral pools in Stonelees Nature Reserve <ul style="list-style-type: none"> • Temporary habitat loss/ disturbance 	Not significant following implementation of embedded mitigation measures	n/a	Not significant
Ephemeral/ short perennial habitats within the proposed substation site and tenant relocation area: <ul style="list-style-type: none"> • Temporary habitat loss/ disturbance 	Not significant following implementation of embedded mitigation measures	n/a	Not significant
Terrestrial invertebrates – outside designated sites: <ul style="list-style-type: none"> • Temporary habitat loss/ disturbance 	Not significant following implementation of embedded mitigation measures	n/a	Not significant
Reptiles – slow-worm and viviparous lizard: <ul style="list-style-type: none"> • Temporary habitat loss/ disturbance • Accidental killing/ injury 	Not significant following implementation of embedded mitigation measures	n/a	Not significant
Breeding birds – Schedule 1 species: <ul style="list-style-type: none"> • Temporary habitat loss/ disturbance • Disturbance (noise & vibration, visual, lighting) • Accidental killing/ injury (in respect of active nests) 	Not significant following implementation of embedded mitigation measures	n/a	Not significant

Description of impact	Impact	Possible mitigation measures	Residual impact
Breeding birds – other species of conservation concern: <ul style="list-style-type: none"> Temporary habitat loss/ disturbance Accidental killing/ injury (in respect of active nests) 	Not significant following implementation of embedded mitigation measures	n/a	Not significant
Breeding birds – all other species: <ul style="list-style-type: none"> Accidental killing/ injury (in respect of active nests) 	Not significant following implementation of embedded mitigation measures	n/a	Not significant
Non-breeding birds – lapwing: <ul style="list-style-type: none"> Temporary habitat loss/ disturbance Disturbance (noise & vibration, visual, lighting) 	Not significant following implementation of embedded mitigation measures	n/a	Not significant
Non-breeding birds – other waterbird species: <ul style="list-style-type: none"> Temporary habitat loss/ disturbance Disturbance (noise & vibration, visual, lighting) 	Not significant following implementation of embedded mitigation measures	n/a	Not significant
Bats: <ul style="list-style-type: none"> Temporary habitat loss/ disturbance Disturbance (noise & vibration, visual, lighting) Accidental killing/ injury (in respect of active nests) 	Not significant following implementation of embedded mitigation measures	n/a	Not significant
Decommissioning			
The predicted effects of decommissioning are considered to be the same or less than those predicted for the construction phase. Following the implementation of embedded mitigation measures (and additional mitigation for passage ringed plover, if required) no significant residual effects are predicted.			
Cumulative effects			
Loss or change (permanent and/ or temporary) to qualifying or notified habitats within designated sites.	Not significant following implementation of embedded mitigation measures	n/a	Not significant
Loss or change (permanent and/ or temporary) to habitats used by qualifying or notified faunal species for designated sites.	Not significant following implementation of embedded mitigation measures	n/a	Not significant

Description of impact	Impact	Possible mitigation measures	Residual impact
Loss or change (permanent and/ or temporary) to important habitats (where not included as qualifying or notified features for designated sites)	Not significant following implementation of embedded mitigation measures	n/a	Not significant
Disturbance to qualifying or notified faunal species for designated sites	Not significant following implementation of embedded mitigation measures	n/a	Not significant
Disturbance to important faunal species populations (where not included as qualifying or notified features for designated sites)	Not significant following implementation of embedded mitigation measures	n/a	Not significant
Displacement of recreational users into areas where they could cause disturbance to non-breeding waterbirds, including qualifying or notified faunal species for designated sites	Not significant following implementation of embedded mitigation measures	n/a	Not significant
Accidental killing or injury to important faunal species populations	Not significant following implementation of embedded mitigation measures	n/a	Not significant

5.17 References

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