



Environmental Impact Assessment Scoping Report

June 2020

Planning Act 2008
The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017
Regulation 10: Application for a Scoping Opinion

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One ◆ Introduction

OVERVIEW

- 1.1 This report identifies the proposed coverage or ‘scope’ of an environmental impact assessment (EIA) that will be undertaken in connection with the Proposed Development of the London Resort at Swanscombe in Kent (the Proposed Development). The scoping report has been compiled by Savills with inputs from technical consultants identified later in the chapter, on behalf of London Resort Company Holdings Limited (‘LRCH’ or ‘the Applicant’).
- 1.2 The Resort will be a nationally significant visitor attraction and leisure resource, built largely on brownfield land at Swanscombe Peninsula on the south bank of the River Thames and with supporting transport and visitor reception facilities on the northern side of the river.
- 1.3 A detailed description of the Proposed Development is provided in chapter five of this report. The focus of the Resort will be a Leisure Core, comprising a range of events spaces, themed rides and attractions, entertainment venues, theatres and cinemas, developed in landscaped settings in two phases known as Gate One and Gate Two. The Gates will have entrance plazas offering ancillary retail, dining and entertainment facilities. The Resort will also include hotels, a water park connected to one of the hotels, a conference and convention centre (known as a ‘conferention centre’), an eSports venue, creative spaces, a transport interchange including car parking and ‘back of house’ service buildings.
- 1.4 Substantial improvements are proposed to transport infrastructure. This will include a dedicated transport link between Ebbsfleet International Station, the Resort and a passenger ferry terminal beyond; a new direct road connection from the A2(T), a coach station and passenger ferry facilities serving visitors arriving by ferry on the River Thames from central London and Tilbury. On the northern side of the Thames to the east of the Port of Tilbury, additional coach and car parking and a passenger ferry terminal are proposed to serve the Resort.
- 1.5 The Proposed Development will involve an extensive restoration of land used in the past for mineral extraction, waste disposal and industrial activities including cement and paper production, with a comprehensive landscape strategy proposed, incorporating wildlife habitats.
- 1.6 The locations of the Proposed Development are shown in Figures 1.1 and 1.2. The Kent Project Site on the Swanscombe Peninsula and its transport connections to the south extend across the border between the boroughs of Dartford and Gravesham in Kent, and has a frontage on the River Thames. The Kent Project Site has an area of approximately 504 hectares (ha). The supporting transport facilities at Tilbury, in the unitary borough of

Thurrock in Essex, would occupy a further 29.9 ha of land, giving a total Project Site area of 533.9 ha.

PROJECT STATUS

- 1.7 On 9 May 2014 the Secretary of State for Communities and Local Government issued a Section 35 Direction confirming that the London Paramount Entertainment Resort qualifies as a nationally significant business or commercial project for which development consent is required under the Planning Act 2008. LRCH must thus apply to the Secretary of State for a Development Consent Order (DCO), and has confirmed that EIA will be undertaken to help inform the Secretary of State’s decision on this application.
- 1.8 Since then the Developer has undertaken considerable site and environmental survey work. Four rounds of public consultation have taken place including a round of statutory consultation in 2015. Progress has also been made in securing land and signing agreements with intellectual property (IP) providers with a global profile to ensure that the rides, shows and attractions offered by the resort have genuine international appeal. Concurrently, extensive work has been undertaken on the testing of development layout options to enable the refinement of a master plan for the resort.
- 1.9 The project has not progressed towards a DCO application as quickly as LRCH originally intended but its complexity should not be under-estimated. It is important to arrive at a workable master plan with a proven business case, informed by a thorough assessment of the development’s environmental, social and economic effects, and which can be delivered once a DCO is made without the need for amendment.

ENVIRONMENTAL IMPACT ASSESSMENT AND THE ‘ROCHDALE ENVELOPE’

- 1.10 Environmental impact assessment is a process that aims to improve the environmental design of a development proposal and provide decision-makers with sufficient information about the significant environmental effects of implementing a project.
- 1.11 The results of the EIA process are set out in an environmental statement (ES). Where required, an ES is normally submitted with an application for planning permission or development consent, and provides environmental information about the scheme, including a description of the development, its predicted environmental impacts and the measures proposed to ameliorate any adverse effects.
- 1.12 For projects requiring development consent under the Planning Act 2008 and for which EIA is required, the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (‘the EIA Regulations 2017’) are applicable. These regulations set out the procedural requirements for undertaking an EIA.

The Rochdale Envelope

1.13 For practical reasons LRCH wishes to maintain flexibility about the detailed design of elements of the project, including the content of Gates One and Two. At the same time, the developer acknowledges the essential need to provide sufficient information about the project to inform the EIA and, if required, the assessment of trans-boundary effects and the Habitat Regulations Assessment (see chapter 6 below). To these ends, the EIA will be undertaken in accordance with what are known as ‘Rochdale Envelope’ principles.

1.14 These principles are explained in Planning Inspectorate Advice Note Nine: *Using the ‘Rochdale Envelope’* (version 3, July 2018). They arose from three court cases concerning outline planning applications for development requiring EIA. Based on the third of these judgements (R. v Rochdale MBC *ex parte* Milne (no. 2), 2000), paragraph 2.4 of the PINS Advice Note sets out the following ‘key principles’ that should be taken into account in the context of the DCO process:

- *the DCO application documents should explain the need for and the timescales associated with the flexibility sought and this should be established within clearly defined parameters;*
- *the clearly defined parameters established for the Proposed Development must be sufficiently detailed to enable a proper assessment of the likely significant environmental effects and to allow for the identification of necessary mitigation, if necessary within a range of possibilities;*
- *the assessments in the ES should be consistent with the clearly defined parameters and ensure a robust assessment of the likely significant effects;*
- *the DCO must not permit the Proposed Development to extend beyond the ‘clearly defined parameters’ which have been requested and assessed. The Secretary of State may choose to impose requirements to ensure that the Proposed Development is constrained in this way;*
- *the more detailed the DCO application is, the easier it will be to ensure compliance with the Regulations.*

1.15 Paragraph 2.5 of Advice Note 9 adds that:

It is ultimately for the decision maker to determine what degree of flexibility can be permitted in the particular case having regard to the specific facts of an application. The Applicant should ensure they have assessed the range of possible effects implicit in the flexibility provided by the DCO. In some cases, this may well prove difficult.

1.16 LRCH acknowledges that there might be elements of its scheme that will require detailed

design in order for the environmental effects and any safeguarding mitigation to be understood. At the same time there will be other parts of the project for which flexibility will be sought in the DCO application, and for which the EIA will employ Rochdale parameters. This will be the case for development inside Gates One and Two at the heart of the resort. From time to time LRCH will need to replace rides and attractions in keeping with changing customer tastes and expectations.

- 1.17 During and after the current EIA scoping process, the Applicant will continue to engage with consultees to ensure that the ES for the London Resort project provides sufficient environmental information to enable them to discharge their statutory responsibilities effectively. The Applicant will ensure also that design detail in which there might be continuing public interest will be the subject of safeguarding DCO 'Requirements' - similar to the planning conditions that attach to a conventional planning permission - so that such details can be submitted for approval to the relevant planning authority at a local level, once the DCO is made.

EIA SCOPING

- 1.18 Regulation 10(1) of the EIA Regulations 2017 enables a person who proposes to make a DCO application to ask the Secretary of State to state in writing his or her opinion as to the scope and level of detail of the information to be provided in the ES. According to paragraph 4.7 of PINS Advice Note 7: *Environmental Impact Assessment: Process, Preliminary Environmental Information and Environmental Statements*:

An effective scoping process should enable the refinement of the assessment and ultimately the information required to form the ES. If done well, it allows for an early identification of the likely significant effects applicable to the EIA Regulations (in particular Schedule 4) and also provides opportunity to agree where aspects and matters can be scoped out from further assessment.

- 1.19 Regulation 10(3) states that:

3) *A request under paragraph (1) must include—*

- (a) a plan sufficient to identify the land;*
- (b) a description of the Proposed Development, including its location and technical capacity;*
- (c) an explanation of the likely significant effects of the development on the environment; and*
- (d) such other information or representations as the person making the request may wish to provide or make.*

- 1.20 LRCH applied for an EIA scoping opinion in November 2014¹. The Secretary of State's

Scoping Opinion followed in December 2014². LRCH's project team took the Scoping Opinion 2014 into account in subsequent assessment work but over time there have been various changes in circumstances that have led LRCH, in consultation with the Planning Inspectorate (PINS), to conclude that the EIA scoping opinion issued in 2014 should be refreshed. These include the following.

- **Project evolution** – the proposals have evolved considerably since 2014 and now include land at the Port of Tilbury that was not taken into account in the original scoping report and opinion.
- **Regulations** - the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 introduced additional requirements for the EIA process, including provisions for the consideration of alternatives, human health, climate change and the risks of major accidents and disasters.
- **Changed circumstances** - the local environmental baseline has evolved considerably since 2014, with substantial new development taking place through the Ebbsfleet Garden City initiative and other infrastructure projects coming forward, including the Tilbury2 port expansion, a DCO for which was made in February 2019, and Highways England's proposals for the Lower Thames Crossing, a DCO application for which will be submitted later in 2020.

- 1.21 LRCH acknowledges also that updated EIA scoping provides a stronger basis for agreeing common ground with local authorities and government agencies.
- 1.22 In preparing this EIA scoping report, LRCH has taken into account the Secretary of State's 2014 scoping opinion for the project and consultation feedback provided then and since by consultees including local authorities, statutory agencies, affected communities and other interests.

THE DEVELOPER AND PROJECT TEAM

London Resort Company Holdings

- 1.23 LRCH is a UK-registered company established specifically to promote the current project. It is led by a management team with considerable experience of delivering and operating some of the world's largest leisure, sports and entertainment developments, and is supported by international investors. LRCH has entered into licence agreements with UK and international film, television and computer game producers and is working

¹ LRCH's 2014 EIA Scoping Report can be viewed here: <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/BC080001/BC080001-000072-EIA%20Scoping%20Report.pdf>

² The Secretary of State's 2014 EIA Scoping Opinion can be viewed here: <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/BC080001/BC080001-000064-Scoping%20Opinion%20Report.pdf>

closely with these partners to develop high quality and innovative themed attractions in the resort.

The project team

1.24 According to Regulation 14(4) of the EIA Regulations 2017:

(4) In order to ensure the completeness and quality of the environmental statement—

(a) the applicant must ensure that the environmental statement is prepared by competent experts; and

(b) the environmental statement must be accompanied by a statement from the applicant outlining the relevant expertise or qualifications of such experts.

1.25 LRCH’s EIA team for the London Resort project comprises the specialist consultants identified in Table 1.1. The professional particulars of the leading individual specialists responsible for the EIA will be appended to the ES submitted with the DCO application.

Table 1.1: EIA project team

Consultant	Responsibility
Savills	Planning consultant and EIA coordinator
BDB Pitmans	Legal adviser (planning / DCO)
Volterra	Socio-economic effects, human health
WSP	Land and river transport
EDP	Landscape and visual effects, terrestrial and fluvial ecology and biodiversity
Buro Happold	Noise, air quality, noise, water resources and flood risk, soils, hydrology and ground conditions, waste and materials
Wessex Archaeology	Cultural heritage and archaeology

1.26 Contact details for the EIA coordinator are provided at the front of this document.

REPORT STRUCTURE

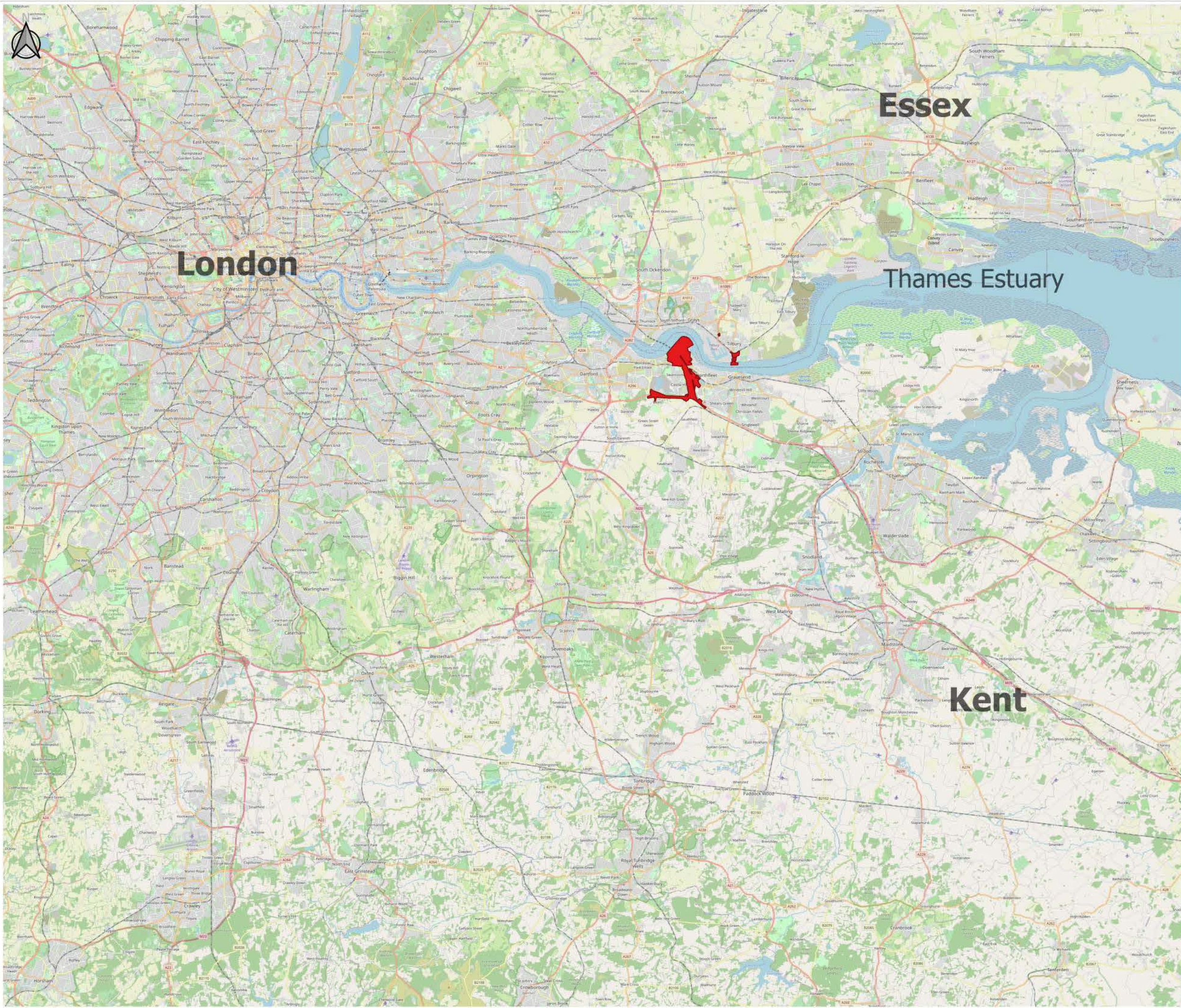
1.27 This scoping report is structured as follows.

- **Chapter two** summarises the legal and regulatory provisions potentially relevant to the assessment of the project’s environmental effects.
- **Chapter three** summarises relevant national and local planning policy.
- **Chapter four** provides a summary of the alternative sites and master-planning approaches that LRCH has considered.
- **Chapter five** provides a description of the Project Site and the Proposed Development.
- **Chapter six** describes the proposed structure of the EIA, including the consideration that will be given to in-combination, cumulative and transboundary effects.
- **Chapters seven to nineteen** identify the proposed scope of individual EIA topics.
- **Chapter twenty** presents the conclusions of this Scoping Report.
- The scoping report concludes with a glossary of technical terms.

YOUR COMMENTS

- 1.28 LRCH welcomes comment on the potential significant environmental effects of the London Resort project and the EIA methods described in this report. Comment is invited also on any other matters that should be addressed during the EIA and any sources of environmental information that would assist the EIA process.
- 1.29 Responses to this report should be sent within 28 days of receipt of this scoping request to:

Case Officer – London Resort
 National Infrastructure Directorate
 The Planning Inspectorate
 Temple Quay House
 Temple Quay
 Bristol
 BS1 6PN



Ref: Figure 1.1 – Location Plan: regional context
 Date: 11-06-2020
 Paper size: A3
 Scale: 1:400000

 Project Site

Figure 1.2 - Location Plan - local context



THE ENVIRONMENTAL DEVELOPMENT OF WIMBORNE
 ORDER LIMITS PLAN
 (APPROVED SUBORDINATE PLANS, WIMBORNE AND WIMBORNE PARISH)
 DATE: 1/1

FOR CONSULTATION PURPOSES

Key

-  Order limits
-  Local Authority boundary



Ref:	Figure 1.2 - Location Plan - local context
Date:	11-06-2020
Paper size:	A3
Scale:	ILLUSTRATIVE ONLY - DO NOT SCALE



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Two ◆ Legislative and regulatory regime

INTRODUCTION

Overview

- 2.1. This chapter provides an overview of the legislative and regulatory context for the EIA and consenting process for the London Resort project.

INFRASTRUCTURE PLANNING

Planning Act 2008

- 2.2. The Planning Act 2008 introduced a new consenting regime for the development of nationally significant infrastructure projects (NSIPs) in the fields of energy, transport, water, wastewater and waste. The intention of the 2008 Act was to speed up the delivery of NSIPs through a consenting process that incorporates:

- extensive pre-application consultation;
- a ‘front-loaded’ design and EIA process with limited scope to amend a proposal once an application is submitted;
- the incorporation of a wide range of consents and authorisations in a single DCO application in addition to planning permission, including the compulsory acquisition of land;
- a clearly timetabled process for examining the application once submitted;
- applications determined in accordance with National Policy Statements approved in Parliament.

- 2.3. The 2008 Act was amended by the Localism Act 2011, which transferred responsibility for determining DCO applications from an Infrastructure Planning Commission to the relevant Secretary of State. Applications are administered by the Planning Inspectorate (PINS), which acts as the ‘Examining Authority’ on the Secretary of State’s behalf.

Infrastructure Planning (Business or Commercial Projects) Regulations 2013

- 2.4. The Infrastructure Planning (Business or Commercial Projects) Regulations 2013 widened the range of projects that can be consented under the 2008 Act to include a specified list of business and commercial developments, including major leisure projects that meet

specified criteria. In March 2014 LRCH wrote to the Secretary of State for Communities and Local Government (as it then was) to request a direction under s.35 of the 2008 Act allowing the London Resort project to be treated as development of national significance, for which a DCO is required.

- 2.5. In a letter dated 9 May 2014, the Secretary of State confirmed that the project constitutes a nationally significant business or commercial project under the 2013 Regulations, and that the project should thus be the subject of a DCO application under the 2008 Act. The London Resort was the first project to be so accepted under the 2013 Regulations.
- 2.6. The Secretary of State for Housing, Communities and Local Government will thus determine the London Resort proposal, having regard to the recommendations of the Planning Inspectorate in its capacity as the Examining Authority.
- 2.7. Unlike other forms of development that can be determined under the 2008 Act, there are no National Policy Statements in respect of business and commercial developments.

Infrastructure Planning (Environmental Impact Assessment) Regulations 2017

- 2.8. The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations 2017) set out the procedural requirements for the carrying out of EIA in relation to projects requiring development consent under the 2008 Act. LRCH's 2014 Scoping Report for the London Resort project was prepared and submitted in accordance with the previous regulations – namely the Infrastructure Planning (Environmental Impact Assessment) Regulations 2009.
- 2.9. Under Regulation 8(1) of the EIA Regulations 2017, a person who proposes to apply for a DCO must, before carrying out consultations under s.42 of the 2008 Act, either request an EIA Screening Opinion or notify the Secretary of State in writing that the applicant will provide an Environmental Statement in respect of the Proposed Development. Regulation 8(1) replaced Regulation Reg. 6(1)(b) of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2009, under which LRCH confirmed to the Secretary of State that it will provide an environmental statement for the London Paramount Entertainment Resort project (paragraph 2.25 of the LRCH's EIA Scoping Report, November 2014, refers).
- 2.10. For the avoidance of doubt, this current EIA Scoping Report provides a written reaffirmation under Regulation 8(1)(b) of the EIA Regulations 2017 that LRCH will provide an Environmental Statement for The London Resort project.
- 2.11. Regulation 10 of the 2017 Regulations concerns applications for EIA scoping opinions. The current report complies with Regulation 10(3), which sets out the essential information that a scoping report must include.
- 2.12. Regulation 11 requires the Secretary of State to notify the consultation bodies of a DCO application requiring EIA. Under Regulation 11(3), subject to conditions, consultation

bodies must make information relevant to the preparation of an environmental statement in their possession available to the Applicant upon request.

OTHER RELEVANT PROVISIONS

Marine and Coastal Access Act 2009

- 2.13. The UK Marine and Coastal Access Act 2009 committed the UK to an ambitious approach to managing the marine environment. This includes provisions relating to marine functions and activities, marine navigation, migratory and freshwater fish, the establishment of coastal walking routes and rights of access to English and Welsh coastlines more generally. Central to the implementation of these provisions was the creation of the Marine Management Organisation (MMO) – the primary body to have the functions conferred on it by or under the 2009 Act.
- 2.14. The MMO exists to make a significant contribution to sustainable development in the marine area, and to promote the UK government's vision for clean, healthy, safe, productive and biologically diverse seas.
- 2.15. The MMO acquired responsibility for licensing arrangements under the Act. Works relevant to the delivery of the London Resort project that might require a marine licence include the removal of existing objects from the river bed, dredging and the construction of a pier.

Environmental Permitting (England and Wales) Regulations 2016

- 2.16. The Environmental Permitting (England and Wales) Regulations 2016 provide a unified permitting system embracing integrated pollution prevention and control and waste management.
- 2.17. The primary aims of the regime are to:
- protect the environment;
 - deliver permitting, and compliance with permits and certain environmental targets, effectively and efficiently, in a way that provides increased clarity and minimises the administrative burden on both the regulator and operators;
 - encourage regulators to promote best practice in their operation of facilities.
- 2.18. The 2016 Regulations make it possible to issue standard permits (encompassing standard conditions) and, in more complex instances, tailored permits. Works and activities potentially required for the construction and operation of the London Resort that might require an Environment Permit include:

- land decontamination and the use of mobile plant for this purpose;
- works affecting licensed landfill sites;
- water discharge,
- works in, under, over or near a main river or in the river's flood plain;
- works on or near the flood defences of a main river;
- waste management operations.

Port of London Act 1968

- 2.19. The Port of London Act 1968 sets out the purposes of the Port of London Authority for administering, preserving and improving the port of London, and for other purposes provided set out within the Act. Notable amendments were made Under the Port of London Acts 1970 and 1982.
- 2.20. The Port of London Authority (PLA) is responsible for operations covering 95 miles of the River Thames, working to maintain safety, protect and enhance the environment and promote the use of the river for trade and travel.
- 2.21. Part V of the 1968 Act relates to operations on the River Thames. Under section 66 the PLA issues licences (known as a 'River Works Licence') for any works '*to carry out, construct, place, alter, renew, maintain or retain works . . .*' under or over the River Thames. It is expected The London Resort will require a River Works Licence. The PLA also manages the use of the Thames for passenger and freight traffic.

Wildlife and Countryside Act 1981

- 2.22. The Wildlife and Countryside Act 1981 contains much of the relevant law on nature conservation and was significantly amended by the Countryside and Rights of Way Act 2000. The 1981 Act gives protection to native species (especially those at threat) and controls the release of non-native species (Part 1), enhances the protection of Sites of Special Scientific Interest (Part II) and builds upon the rights of way rules in the National Parks and Access to the Countryside Act 1949 (Part III).
- 2.23. As explained in chapters 12 and 13 of this report, a range of protected wildlife species are present in and around the Project Site. The Baker's Hole Site of Special Scientific Interest (SSSI) is located in the Ebbsfleet Valley to the north-west of Ebbsfleet International Rail Station lies within the proposed DCO Order Limits for the current project. Further SSSIs are located nearby, including the Swanscombe Skull SSSI (also designated as a National Nature Reserve and the West Thurrock Lagoon and Marshes SSSI. Section 28E of the 1981 Act requires that operations affecting SSSIs obtain consent from Natural England.

Water Resources Act 1991

- 2.24. The Water Resources Act 1991 seeks to prevent and minimise the pollution of water, with enforcement a responsibility of the Environment Agency. The 1991 Act introduced water quality classifications and objectives for the first time. Under the 1991 Act it is an offence to cause or knowingly permit any poisonous, noxious or polluting material, or any solid waste to enter any controlled water.
- 2.25. Part IV of the 1991 Act concerns flood defences and is likely to be particularly relevant to the London Resort project.

Land Drainage Act 1991

- 2.26. The Land Drainage Act 1991 consolidated previous legislation relating to internal drainage boards, and to the functions of such boards and of local authorities in relation to land drainage. It has itself been amended, including by the Flood and Water Management Act 2010.
- 2.27. The 1991 Act requires that a watercourse be maintained by its owner in such a condition that the free flow of water is not impeded, and thus requires the consent of the relevant body prior to structures (such as culverts or modifying an existing culvert) where this would obstruct the flow in the watercourse. The London Resort project is expected to affect watercourses and the provisions of the 1991 Act are relevant.

Natural Environment and Rural Communities Act 2006

- 2.28. The Natural Environment and Rural Communities Act 2006 defines Natural England's statutory responsibilities for conserving, enhancing and managing England's natural environment for the benefit of current and future generations.
- 2.29. The 2006 Act makes provision in Part 3 in respect of biodiversity, pesticides harmful to wildlife and the protection of birds, and in respect of invasive non-native species. It sets out enforcement powers and time limits in connection with wildlife protection and prosecution. Part 4 of the 2006 Act concerns SSSIs and part 6 concerns rights of way, which are relevant likewise in the current context.

Flood and Water Management Act 2010

- 2.30. The Flood and Water Management Act 2010 requires flood and coastal erosion risk management authorities to aim to contribute towards the achievement of sustainable development when exercising their flood and coastal erosion risk management functions. Key aspects include, but are not limited to:
- risk management and responsibilities;
 - administration and power of water companies;

- sustainable drainage;
- reservoirs.

2.31. The 2010 Act is relevant to the London Resort project given its proximity to the River Thames and associated flood defences, and the need to identify an effective drainage strategy for the Project Site.

Conservation of Habitats and Species Regulations 2017

2.32. The Conservation of Habitats and Species Regulations 2017 make provision for the selection, designation, registration and notification of sites to be protected under European Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora ('the Habitats Directive'). The 2017 Regulations also implement aspects of the Marine and Coastal Access Act 2009 (see above).

2.33. The objective of the Habitats Directive is to protect biodiversity through the conservation of natural habitats and species of wild fauna and flora. The Directive lays down rules for the protection, management and exploitation of such habitats and species.

2.34. There are no European Protected Sites either within or immediately adjacent to the Project Site, the nearest sites being:

- Thames Estuary and Marshes SPA/Ramsar (approximately 7.5km east);
- Medway Estuary and Marshes SPA/Ramsar (approximately 19km east);
- Swale SPA/Ramsar (approximately 32km east).

2.35. If it is considered that the London Resort project is likely to have a significant effect on a protected habitats site (either individually or in cumulatively with other plans or projects) then an Appropriate Assessment of the implications for the site(s), in view of the conservation objectives, will be undertaken. Chapters 12 and 13 of this scoping report address this point.

Other law and regulations

2.36. Other law and regulations are reflected, as appropriate, in the relevant chapters of this scoping report.

Three ◆ National and local planning policy

INTRODUCTION

Relevant policy

- 3.1. This chapter provides an overview of relevant planning and other policy against which LRCH's DCO application will be considered. A particular concern of the chapter is to identify policy considerations that might influence the scope of the EIA for the London Resort project. Further policy directly relevant to individual EIA topics is considered in the corresponding topic-based chapters of this scoping report.
- 3.2. For a development of this scale and complexity it should be emphasised that the outset that a very wide range of policy can be of relevance to the London Resort EIA. This chapter identifies some of the most relevant provisions and further policy and guidance is identified in the topic-based chapters of this scoping report.
- 3.3. In policy terms business or commercial NSIPs such as the London Resort have an unusual status. For a defined range of energy, transport, water, wastewater and waste NSIPs identified in part 3 of the Planning Act 2008, section 5 of the 2008 Act enables the relevant Secretary of State to 'designate' a National Policy Statement (NPS) to guide the determination of DCO applications. NPSs are presented to Parliament for approval. Section 104 of the 2008 Act requires the Secretary of State to have regard to any NPS that has effect in relation to development to which the application relates.
- 3.4. For business or commercial NSIPs there is no NPS. In those circumstances section 105 of the 2008 Act requires the Secretary of State to have regard to any Local Impact Reports produced by local authorities in the area affected by the project and to any matters prescribed in relation to the type of development involved and which the Secretary of State considers to be important and relevant to the determination of the DCO application.
- 3.5. In the current context LRCH considers that these relevant matters will include the National Planning Policy Framework (NPPF) and local plans prepared by the relevant planning authorities in the area affected by the Proposed Development.
- 3.6. Although not a transport NSIP, a substantial component of the London Resort project comprises transport infrastructure, including a dedicated road link from the A2 (T), an interchange at Ebbsfleet International Station, a shuttle bus route running between Ebbsfleet International Station, the Resort's leisure core and a new passenger pier on the Thames, further facilities for ferry passengers at Tilbury and coach and car parking at both Tilbury and on the Swanscombe Peninsula. With these transport facilities in mind, this scoping report has regard to the National Networks National Policy Statement, which sets

out policies for road and rail networks, and to the National Policy Statement for Ports, which includes policies relating to tourism.

NATIONAL POLICY

National Networks NPS (December 2014)

- 3.7. This NPS sets out the need for, and government's policies to deliver, the development of nationally significant road and rail network infrastructure in England. It provides planning guidance for promoters of nationally significant infrastructure projects on the road and rail networks, and the basis for the examination of applications by the Examining Authority and decisions by the Secretary of State.
- 3.8. Chapter 3 of this NPS summarises government policy on national networks, including the need to take into account the positive and negative social and environmental impacts of transport infrastructure and the government's general approach to safety, the reduction of emissions and the uptake of new transport and traffic management technology.
- 3.9. Chapter four of the National Networks NPS identifies assessment principles for road and rail infrastructure. Chapter five sets out general policy in respect of the assessment, mitigation and examination of generic impacts, including air quality, carbon emissions, biodiversity, landscape, noise, flood risk and the wider impact on transport networks. The topic-based chapters of this scoping report show how the EIA will apply these principles in the assessment of environmental effects arising from the transport components of the London Resort project.

NPS for Ports (January 2012)

- 3.10. The NPS for Ports provides the framework for decisions on proposals for new port development. It is also a relevant consideration for the Marine Management Organisation, established in the Marine and Coastal Access Act 2009, which decides other port development proposals, and for local planning authorities where they have a role to play.
- 3.11. The NPS for Ports is considered potentially to be a relevant consideration in the context for three reasons.
- i). The London Resort project has a significant marine dimension, involving development on both sides of the Thames and a substantial reliance on river transport for the movement of construction materials, the supply of goods for the operational resort and the ferrying of resort visitors and staff to and from central London and Port of Tilbury.
 - ii). LRCH's project sites in Kent and Essex are both adjacent to the Port of Tilbury, which is London's primary freight port and a strategic logistics hub for the nation as a whole. As explained in chapter five of this scoping report, the port is being expanded through

the construction of Tilbury2 to the east of LRCH'S Essex Project Site. Tilbury2 is an NSIP for which a DCO was made in February 2019, and will include a roll-on/roll-off (RoRo) terminal and a construction materials and aggregates terminal (CMAT), with associated infrastructure including rail and road facilities and modifications to the existing marine infrastructure.

- iii). Section 4.6 of the NPS for Ports addresses tourism specifically. According to paragraph 4.6.1:

Port developments that include a passenger or cruise terminal may have a positive impact on tourism in the local area by increasing accessibility, particularly in outlying regions. This should be taken into account in assessing the overall benefits. Where increased tourism is likely significantly to affect demand for local services, this impact should be assessed. Additional benefit should also be identified through promoting the historical legacy of working ports; this is important in terms of the changing economic life of ports and how such change is compatible with conserving heritage assets.

LRCH proposes to share the Grade II* listed floating landing stage at Tilbury with the London International Cruise Terminal and wants to ensure that resort and cruise operations work harmoniously together.

- 3.12. These interactions between the Port of Tilbury and the London Resort have the potential to give rise to a range of economic, transport and environmental effects. To ensure that these effects are understood and assessed in the context of national ports policy, The London Resort EIA will have regard to relevant NPS policies on the economic importance of ports and port infrastructure (NPS chapter 3), assessment principles (NPS chapter 4) and generic impacts (NPS chapter 5).

National Planning Policy Framework (February 2019)

- 3.13. The National Planning Policy Framework (NPPF) sets out the government's planning policies for England. The document covers a wide variety of planning matters, providing advice to Local Planning Authorities (LPA) on plan making and decision making (development management).

- 3.14. NPPF paragraph 5 advises that:

'The Framework does not contain specific policies for nationally significant infrastructure projects. These are determined in accordance with the decision-making framework in the Planning Act 2008 (as amended) and relevant national policy statements for major infrastructure, as well as any other matters that are relevant (which may include the National Planning Policy Framework). National policy statements form part of the overall framework of national planning policy, and may be a material consideration in preparing plans and making decisions on planning applications'.

3.15. In the absence of a NPS for business and commercial developments regard will be had to the relevant parts of NPPF, particularly during the site design and assessment process, as a material consideration. Chapters of the NPPF of potential relevance to the design and EIA for the London Resort include:

- *Chapter 6 - Building a strong, competitive economy*
- *Chapter 8 - Promoting healthy and safe communities*
- *Chapter 9 - Promoting sustainable transport*
- *Chapter 11 - Making effective use of land*
- *Chapter 12 - Achieving well-designed places*
- *Chapter 14 - Meeting the challenge of climate change, flooding and coastal change*
- *Chapter 15 - Conserving and enhancing the natural environment*
- *Chapter 16 - Conserving and enhancing the historic environment*
- *Chapter 17 - Facilitating the sustainable use of minerals*

3.16. Relevant topic-based guidance from National Planning Practice Guidance will also be considered.

3.17. The presumption in favour of sustainable development that, according to paragraph 10, lies at the heart of the NPPF ties together economic, social and environmental objectives, summarised in NPPF paragraph 11. LRCH has adopted a similar approach to the design of the London Resort and proposes that sustainable development considerations will be inherent in the Environmental Statement for the project, rather than being presented in a 'bolt-on' assessment.

3.18. According to NPPF paragraph 24:

'Local planning authorities... are under a duty to cooperate with each other, and with other prescribed bodies, on strategic matters that cross administrative boundaries.'

3.19. Paragraph 26 continues:

'Effective and on-going joint working between strategic policy-making authorities and relevant bodies is integral to the production of a positively prepared and justified strategy.'

3.20. For a project spanning three local authority areas and a Garden City in two counties, joint working is important. To assist this LRCH will continue to organise joint meetings with the relevant planning authorities and the statutory agencies.

Marine planning

3.21. The Order Limit extends to include parts of the River Thames. As such, matters relating to marine planning are pertinent to the consideration of the DCO application. Under section 104(2)(aa) of the 2008 Act, the Secretary of State must have regard to the UK Marine Policy Statement (September 2011) in determining a NSIP application where a NPS has effect.

- 3.22. The UK Marine Policy Statement aims to contribute to the achievement of sustainable development in the United Kingdom marine area and is the framework for the preparation of Marine Plans and for decisions affecting the marine environment. It was prepared and adopted for the purposes of section 44 of the Marine and Coastal Access Act 2009. The UK Marine Policy Statement will be taken into account in the EIA for the London Resort project.
- 3.23. In April 2020 the Marine Management Organisation (MMO) completed a final consultation on the South East Marine Plan before submitting it to the Secretary of State for Environment, Food and Rural Affairs for adoption. The draft plan adopts an integrated approach to the management of the marine environment, taking into account fishing, marine aggregates, marine energy developments, biodiversity, tourism and recreational demands.
- 3.24. Once published as a Consultation Draft, Marine Plans become a material consideration and upon adoption become statutory. As such, the draft South East Marine Plan will be taken into account in the EIA for London Resort.

Tourism Action Plan 2016

- 3.25. In August 2016 the government published its Tourism Action Plan. The action plan has five main themes:
- tourism landscape;
 - jobs and skills;
 - transport;
 - common-sense regulations;
 - a GREAT welcome.
- 3.26. Published in the aftermath of the UK referendum on leaving the European Union, the Tourism Action Plan includes a series of new initiatives and measures to help Britain compete with other international tourism destinations, welcoming more overseas visitors and encouraging British residents to holiday at home. The specific aims of the strategy are to:
- build awareness of Britain’s attractiveness as a tourism destination among those who have not yet visited Britain;
 - encourage prior visitors to return;
 - provide a series of opportunities and incentives, working in partnership with the private sector, to visit Britain now.
- 3.27. The Tourism Action Plan is not a statutory planning document and does not refer to the London Resort concept specifically. However, it is considered relevant to the socio-

economic assessment of the London Resort project (see chapter seven of this Scoping Report).

Visit Britain / Visit England – Our Five Year Strategy 2020-2025

3.28. Tourism in Britain is worth £127 billion, contributing 9% GDP and accounting for 10% of all jobs. Until the coronavirus pandemic, spending by overseas visitors was predicted to reach a record £26.6 billion in 2020 with overseas visits growing to 39.7 million, the highest ever. The national tourist agency's new five-year strategy sets an ambitious growth target for Britain - to attract 49 million visits by 2025, spending £35 billion.

3.29. To this end the strategy has five main objectives, described as follows:

- *Focusing on the most valuable visitors to Britain and those with the highest propensity to travel, we will **grow the value** of both leisure and business tourism to Britain through our new market strategies and support venues and industry to win international business events. We will also encourage more people to holiday at home through our domestic marketing activity.*
- *Driving the **dispersal of tourism value across Britain**, we will develop products to appeal to our best prospect visitors, working with destinations across England, Scotland and Wales on our global marketing campaigns. Building on our commercial activity, our partnerships will be integrated further and deepened to leverage even greater reach, innovation and value.*
- *We will **support productivity optimisation**, through the development of product that extends the season and length of stay for both international and domestic visitors, as well as through the distribution of that product through platforms such as Tourism Exchange Great Britain (TXGB).*
- *In line with our statutory role as advisor to Government and industry, we will continue to be the **expert body on growing tourism**, trusted to provide unique insights and guidance so that the economic importance of tourism is understood by politicians, Government departments and the media.*
- *The three-year £40m Discover England Fund helped stimulate new product development in England, but there is still a wealth of opportunities for growth in England's regions. We will **deliver a clear strategy for England**, continue to be a 'voice for England' and work with industry to support productivity, grow value and reach new markets and segments.*

*Through working together, we will achieve our ambition, united behind a clear mission: **to make tourism one of the most successful and productive sectors for the UK economy.***

3.30. By providing a visitor attraction of international status, open throughout the year, in an area that is not currently a premier tourism and leisure destination, the London Resort

should make a significant contribution to the attainment of Visit Britain / Visit England's objectives. In the absence of an NPS for tourism and leisure, the Five Year Strategy represents an important expression of national need against which the DCO application for London Resort can be assessed. The strategy will be taken in to account in the assessment of the socio-economic effects of the London Resort project.

LOCAL POLICY

Overview

- 3.31. Local plans can be an important reference source in the scoping of an EIA. Amongst other things they can assist an EIA team to identify:
- environmental objectives, constraints and data sources;
 - land and features subject to protective environmental designations;
 - future development of socio-economic significance that should be taken into account in the assessment of cumulative effects;
 - environmental management strategies.
- 3.32. This section identifies the local plans that will be consulted during the EIA for the London Resort project. The plans have been produced by:
- Dartford Borough Council (DBC);
 - Gravesham Borough Council (GBC);
 - Kent County Council (KCC);
 - Thurrock Council (TC);
- 3.33. In addition to these local authorities, the Ebbsfleet Development Corporation (EDC) also falls to be considered, as it has important planning powers in its administrative area (see below).
- 3.34. The structure of local government varies between these authorities. South of the River Thames there is a two tier structure, with DBC and GBC being district authorities with KCC being the county planning authority. Responsibilities for services are split between the two tiers. In addition, in 2014, the Ebbsfleet Development Corporation was set up by the government to deliver up to 15,000 homes and create a 21st century garden city, known as Ebbsfleet Garden City. EDC's area includes land within the boundaries of DBC and GBC and contains a number of strategic sites, including the Swanscombe Peninsula. EDC has development management responsibilities across its area.
- 3.35. North of the River Thames, Thurrock Council is a unitary authority, bordered by areas administered by other district councils and Essex County Council.

3.36. Planning policy and development management responsibilities for each of these local authorities are set out in table 3.1.

Table 3.1: Summary of planning policy and development management responsibilities

Local Authority	Type	Planning policy			Development management		
		General	Minerals	Waste	General	Minerals	Waste
Dartford Borough Council	Borough (District)	Y	N	N	Y	N	N
Gravesham Borough Council	Borough (District)	Y	N	N	Y	N	N
Ebbsfleet Development Corporation	Development Corporation	N	N	N	Y	Y	Y
Kent County Council	County	N	Y	Y	N	Y	Y
Thurrock Council	Unitary authority	Y	Y	Y	Y	Y	Y

3.37. An overview of the relevant development plan documents is provided in the following paragraphs and summarised in Table 3.2.

3.38. Several authorities are also progressing new development plan documents, and these emerging plans will also be considered during the design and assessment of The London Resort proposals where relevant. Appropriate weight should be given to draft documents.

Dartford Borough Council

3.39. DBC is a district-tier council and the local planning authority. Responsibilities for highways and mineral and waste planning remain with Kent County Council. The current development plan documents are as follows:

- Dartford Core Strategy (September 2011);
- Dartford Development Policies Plan (July 2017);
- Dartford Local Plan Policies Map (July 2017).

3.40. Paragraph 2.6 of the Dartford Development Policies Plan states that:

'The 'London Resort' leisure proposal is located in the EDC area at Swanscombe Peninsula. This is expected to be considered as a National Significant Infrastructure Project (NSIP) and be determined directly by the Planning Inspectorate.'

3.41. DBC is producing a new local plan covering the period to 2036. A preferred options public consultation (a 'Regulation 18' consultation) was held in January – February 2020, setting out emerging proposals alongside alternative approaches.

Gravesham Borough Council

- 3.42. GBC is a district-level authority and the local planning authority. Responsibilities for highways and mineral and waste planning remain with Kent County Council.
- 3.43. The current development plan documents are as follows:
- Gravesham Local Plan Core Strategy (September 2014);
 - Gravesham Local Plan First Review (November 1994) Saved Policies;
 - Gravesham Local Plan Core Strategy Policies Map (September 2014).
- 3.44. GBC completed a review of its planning policies in September 2019. Only one policy, 'Policy CS02: *Scale and distribution of development*', was found to require modification. It is understood there is no emerging development plan document at the time of writing.

Ebbsfleet Development Corporation

- 3.45. The EDC assumed responsibility for some planning functions in its area on 1 July 2015. The Designated Garden City area includes much of the Swanscombe Peninsula, the Ebbsfleet Valley to the south, Eastern Quarry and two smaller areas on the banks of the Thames at Northfleet and Gravesend. Whilst the EDC has development management functions and a master-planning role for its area, it does not prepare statutory development plan documents but relies upon the development plan context formed by DBC, GBC and KCC to determine planning applications submitted to it.
- 3.46. In 2017 Ebbsfleet Development Corporation published the Ebbsfleet Garden City Implementation Framework. The Framework identifies a large central area of Swanscombe Peninsula as 'Land subject to London Entertainment Resort NSIP process' and proposes that the marshes and other open land around it should be 'an open estuarine ecological park'.

Kent County Council

- 3.47. As the minerals and waste planning authority for Kent, KCC plans for waste management capacity and mineral provision across its administrative area. The development plan documents in this regard comprise:
- Kent Minerals and Waste Local Plan (July 2016).
- 3.48. KCC is working on preparing a Kent Mineral Sites Plan to identify specific sites, whilst also progressing an early partial review of the Kent Minerals and Waste Local Plan.

Thurrock Council

3.49. Thurrock Council is a unitary authority, having responsibilities that include highways and minerals and waste planning in addition to district planning functions.

3.50. The current development plan documents are as follows:

- Core Strategy and Policies for Management of Development (January 2015);
- Thurrock Borough Local Plan (September 1997) Saved Policies.

3.51. The Core Strategy was adopted on 21 December 2011 and updated on 28 January 2015, following an independent examination focussing on its consistency with the NPPF.

3.52. In February 2014 the Council decided to start work on a new Thurrock Local Plan. This will consolidate work started and subsequently suspended on the Core Strategy Broad Locations and Strategic Sites, the Site Allocations Local Plan and the Minerals and Waste Local Plan for Thurrock.

Summary

3.53. Table 3.2 below provides an overview of the local plans that will be referred to during the EIA for the London Resort project.

Table 3.2: Summary of development plan and other planning policy

Local Authority	Adopted	Emerging
Dartford Borough Council	<ul style="list-style-type: none"> • Dartford Development Policies Plan (July 2017) • Dartford Core Strategy (September 2011) 	<ul style="list-style-type: none"> • New Local Plan (Preferred Options)
Gravesham Borough Council	<ul style="list-style-type: none"> • Gravesham Local Plan Core Strategy (September 2014) 	
Kent County Council	<ul style="list-style-type: none"> • Kent Minerals and Waste Local Plan (July 2016) 	<ul style="list-style-type: none"> • Kent Minerals Sites Plan • Kent Minerals and Waste Local Plan Early Partial Review
Thurrock Council	<ul style="list-style-type: none"> • Core Strategy and Policies for Management of Development (January 2015) • Thurrock Borough Local Plan (September 1997) Saved Policies 	<ul style="list-style-type: none"> • Thurrock Local Plan (Issues and Options)

Four ◆ Alternative sites and project evolution

INTRODUCTION

- 4.1 An effective site selection process is a precondition for a successful project. It influences both the likelihood of securing a consent to build a development and the prospects of commercial success once a development becomes operational. From the outset, LRCH has been acutely aware of the need to secure the optimal site for the London Resort, and then to test different development and access scenarios for the chosen site.
- 4.2 This chapter has two purposes – to explain the site selection process that led the Swanscombe Peninsula in Kent to be identified as the preferred location for an entertainment resort, and to summarise the development options that were considered once the Swanscombe site had been selected.

AREA OF SEARCH

- 4.3 The preceding chapter of this scoping report summarises the policy context for the emerging proposals, highlighting amongst other things the need for new visitor attractions in the UK capable of attracting international visitors and retaining domestic tourists. The UK is one of the most visited countries in the world but currently fails to provide an entertainment resort comparable with those found elsewhere in Europe and in California, Florida and across Asia.
- 4.4 A question faced by the project promoters at the outset was where in the UK an entertainment resort with a truly global profile in the UK should be located. By a large margin, London is the most popular destination for international visitors, suggesting that a location close to the capital was desirable. London offers direct air and rail connections and is located conveniently with respect to international ferry services. Domestically, London is also the hub of the national rail and road networks. No other region of the UK (and few places elsewhere in Europe) offer comparable connectivity or population density. It was thus determined that the entertainment resort should be located within 100 km of central London.
- 4.5 Parts of this general area of search are subject to significant planning and environmental constraints. These include the metropolitan green belt that encircles Greater London, the Chilterns Area of Outstanding Natural Beauty (AONB) to the north-west of London, the Surrey Hills AONB to the south-west and the Kent Downs AONB to the south and south-east. In the gap between the Chilterns and Surrey Hills AONBs there are already three theme parks – Legoland, Thorpe Park and Chessington World of Adventures – albeit each smaller in scale and catering more for day trips than the proposed London Resort. Having regard to these considerations, LRCH decided to focus its site search in a broad corridor

extending from Northamptonshire in the north-west, around the north and east of London to Kent in the south-east. This search corridor and the eleven options identified and reviewed within it are shown in figure 4.1.

SITE SELECTION CRITERIA

4.6 With an area of search defined, LRCH proceeded to draw up a list of site selection criteria. These were broadly based in order to give weight to planning, environmental, social and economic considerations that lay beyond LRCH's immediate commercial objectives. This approach aligns with the dimensions of sustainable development identified in paragraph 8 of the National Planning Policy Framework (NPPF, published in February 2019).

4.7 In no order of priority, the site selection criteria were defined as follows. It was recognised from the outset that it might be impractical to secure a site capable of completely matching all criteria and that compromise might be necessary.

i). Land availability

4.8 By definition the site needs to be large enough to accommodate the entertainment resort, including a theme park, attendant visitor attractions and amenities, hotels and transport facilities. The site should also have a generally level terrain to facilitate construction and ease of access around the resort for mobility-impaired guests.

4.9 To meet these requirements, LRCH initially defined a minimum area of 80 hectares, preferably with room for future expansion. The land would preferably be available for purchase on commercially acceptable terms.

ii). Land use

4.10 The resort should be compatible with neighbouring land uses and, where possible, should avoid displacing existing land uses, particularly residential occupiers. A high priority was accorded to identifying vacant or under-used brownfield land in preference to greenfield sites.

iii). Proximity to and connectivity with central London

4.11 For reasons given, connectivity with London is essential for the attractiveness and viability of the entertainment resort. The brand under which the resort is ultimately marketed is likely to incorporate reference to London. To facilitate connectivity, the Project Site should ideally be as close to central London as possible, with direct transport connections.

iv). Transport and accessibility

4.12 The Project Site requires first class transport links in a variety of modes, including ample opportunity to travel to the resort by means other than the car. These links must be local,

regional, national and international, and close proximity or good access to established transport interchanges is highly desirable.

v). Environmental constraints

- 4.13 The Project Site should as far as possible be free of land and buildings of designated landscape, natural, cultural or historic interest.

vi). Planning constraints

- 4.14 The Proposed Development should as far as possible avoid compromising other planning intentions, including adopted development plan policy and the implementation of existing planning permissions. A particular concern is to avoid conflict with green belt policy, a significant constraint given the extent of the metropolitan green belt around Greater London.

vii). Regeneration and economic benefit

- 4.15 The entertainment resort is expected to have a transformative effect on the economy of the area that hosts the development, through direct investment in the development, its operation and the attraction of visitors to the locality. LRCH is concerned to ensure that the net economic impact is substantially beneficial rather than disruptive to the local economy, housing supply or visitor attractions. The ability of the development to dovetail with wider regeneration initiatives is thus important, as is the local availability of a workforce for the entertainment resort.

viii). Micro-climate

- 4.16 The location should offer a climate conducive to the year-round operation of an entertainment resort, having regard to the fact that visitors will be outside at various times during their visits. This criterion was dropped at an early stage because, with the options sharing a broadly similar climate, it provided no meaningful basis for differentiation.

EVALUATION OF LOCATIONAL OPTIONS

- 4.17 The initial search for broad locations for the entertainment resort combined a desktop search, site inspections and contacts with landowners and agents. Options identified through this process are mapped in figure 4.1 and are as follows.

1. North Northamptonshire
2. Marston Vale
3. Luton and Dunstable
4. M25 north corridor
5. M11 corridor
6. Great Leighs racecourse, Essex

- 7. Southend-on-Sea and Canvey Island
- 8. Cliffe, north Kent
- 9. Swanscombe Peninsula, Kent
- 10. Ashford, Kent
- 11. Olympic Park legacy development sites, London

4.18 The findings of the individual evaluations of these eleven options are summarised in appendix 4.1 to this scoping report and illustrated in table 4.1 below.

Table 4.1: Summary of the site options evaluation undertaken by LRCH in 2011-12

Red = negative Amber = neutral Green = positive

	Option	Land availability	Land use	Proximity to London	Transport and accessibility	Environmental constraints	Planning constraints	Regeneration and economic benefit	Overall assessment
1.	North Northamptonshire	Amber	Red	Red	Amber	Amber	Amber	Amber	Red
2.	Marston Vale	Amber	Red	Red	Amber	Amber	Red	Amber	Red
3.	Luton / Dunstable	Red	Red	Amber	Amber	Red	Red	Green	Red
4.	M25 north corridor	Red	Red	Green	Green	Amber	Red	Amber	Red
5.	M11 corridor	Red	Red	Amber	Green	Amber	Red	Green	Red
6.	Great Leighs racecourse	Red	Amber	Red	Amber	Green	Amber	Red	Red
7.	Southend / Canvey Island	Red	Red	Red	Red	Amber	Red	Green	Red
8.	Cliffe, north Kent	Amber	Amber	Amber	Red	Red	Amber	Amber	Red
9.	Swanscombe, north Kent	Amber	Green	Green	Amber	Green	Green	Green	Green
10.	Ashford, Kent	Red	Red	Amber	Amber	Amber	Red	Red	Red
11.	Olympic Park legacy sites	Red	Red	Green	Green	Amber	Red	Green	Red

4.19 The original intention was to reduce the long list to a shortlist of between two and four

options for more detailed evaluation. In the event, one option performed so well against all of the evaluation criteria in comparison with the alternatives that LRCH decided to focus on confirming the feasibility of that option. The site concerned was the Swanscombe Peninsula on the Thames estuary (option 9).

- 4.20 As the summary in Appendix 4.1 affirms, this option offers a unique combination of advantages. It centres upon a large and generally unused brownfield site with a broadly level terrain, large enough to accommodate a full resort development. It is close to the edge of London but outside of the metropolitan green belt. It lies only 1 km north of Ebbsfleet International Station, which offers high speed train connections to London St Pancras International station with a journey time as low as 17 minutes and services to and from continental Europe.
- 4.21 Strategic highway routes in the locality include the A2(T), which passes 3 km to the south of the peninsula and provides a connection to Junction 2 of the M25 motorway to the west and onwards into London. The Dartford Tunnels and Queen Elizabeth II Bridge crossings of the River Thames lie approximately 3 km to the west of the site. The Swanscombe Peninsula does not contain any international or national wildlife or heritage designations, and it offers the potential to dovetail the resort development with significant local economic regeneration initiatives.
- 4.22 LRCH verified these conclusions through early discussions with landowners and the county and local authorities, supported by preliminary site investigations and conceptual design feasibility work, before deciding to announce the Swanscombe site as its preferred option for an entertainment resort.
- 4.23 Having determined that the Swanscombe site provided the best location for an entertainment resort, LRCH proceed to appraise a range of development layout and access options for the site. For clarity these will be described in turn, although the options appraisal took place in an integrated and iterative manner.

EVALUATION OF DEVELOPMENT LAYOUT OPTIONS

- 4.24 This work has brought together several distinct strands, as follows:
- **Site evaluation**, including preliminary assessments of ground conditions, landscape and heritage sensitivities and ecology field surveys. The environmental evaluation was formalised following the receipt of EIA screening opinions from Dartford and Gravesham Borough Councils in 2013, confirming the need for EIA. Once the project had been accepted as an NSIP, LRCH requested an EIA scoping opinion from the Secretary of State for Communities and Local Government, which was issued in December 2014 and confirmed the scope of the applicant's environmental studies. As explained in chapter 1 of the current report, an updated scoping opinion is being requested.

- **Analysis of existing patterns of land use, land ownerships and liabilities.** This work has been informed by extensive dialogue with landowners and occupiers, as will be confirmed by the Consultation Report and Book of Reference that will accompany the DCO application.
- **Conceptual design studies.** This design work has taken into account the specific requirements of intellectual property (IP) providers around whose themed attractions the entertainment resort will be based. In addition, technical advice on the requirements for visitor accommodation has been provided by hotel operators.
- **Extensive consultations** with local authorities, statutory agencies, landowners and other interested parties, including two rounds of public consultation in 2014 to test the general concept of building and operating an entertainment resort in this location, and a further two rounds of public consultation including statutory consultations in April-June 2015 and a final round of statutory consultation programmed for summer 2020.

4.25 The range of options considered during the design process is too large to describe in detail but enabled the following matters to be evaluated.

Development content and land take

4.26 LRCH and its advisers tested a range of development options and confirmed the area of land required to deliver a viable and globally-attractive resort. This requirement was then reconciled with site constraints and the land-take of associated development. Sensitivities taken into account included the following.

- i). The amenity of residential neighbourhoods at the south-western corner of the Swanscombe Peninsula,
- ii). The displacement of existing businesses from the Manor Way, Northfleet and Kent Kraft industrial estates.
- iii). The ecological value of Swanscombe Peninsula and the excavated chalk pits to the south, including the need to retain areas of habitat on Black Duck, Botany and Broadness marshes and the potential for off-site mitigation.
- iv). Ground conditions, drainage and land contamination, including the desire to minimise disturbance to CKD deposits and to accommodate existing drainage arrangements across the site.
- v). Physical constraints presented by features including local terrain, flood defences along the Thames shoreline, the HS1 railway and electricity transmission lines.
- vi). Transport requirements – which are considered specifically below.

- vii). The need for future flexibility in the content of Gates 1 and 2. The content of the themed lands might need to change from time to time in keeping with market demand and the emergence of new IP and entertainment media.

Building heights and development massing

4.27 Considerations taken into account in the assessment of options included views of the resort from surrounding neighbourhoods, including Swanscombe to the south and Ingress Park to the west, the need to achieve appropriate separation from electricity transmission lines, and the need to protect the structural integrity of the HS1 cutting and tunnels. Massing diagrams also took into account the maximum height, length and breadth of rides proposed in individual themed ‘lands’ in Gates 1 and 2 and desire for a visually prominent central feature in the leisure core. Various massing options were tested and will be expressed as parameters in the draft DCO and works plans.

Scheme evolution

- 4.28 Figures 4.2 a-e show draft master plans of the resort at critical stages in the design and consultation process, illustrating how the proposed development layout has evolved.
- *Figure 4.2a* shows the original resort vision, with a single gated theme park with all retail, dining and entertainment (RDE) contained within the secure ‘payline’. This plan demonstrated that the Swanscombe peninsula is capable of accommodating an entertainment resort. However, a single theme park area would not assist the delivery of the development in phases, and including all RDE within the payline would limit the availability of Resort amenities to local people and would not facilitate the staging of entertainment and conference events unconnected with the theme park.
 - *Figure 4.2b* responds to these concerns, showing a two-gate theme park and many RDE amenities outside of the theme park payline. In this option, more consideration was given to the siting and content of ‘resort-style’ hotels to optimise the resort experience for guests.
 - *Figure 4.2c* shows an expansion of the two theme park ‘Gates’ and a higher density hotel provision.
 - *Figure 4.2d* shows a revised concept to accommodate a series of ‘lands’ in the two Gates. Each land would contain rides and attractions from a different IP provider.
 - *Figure 4.2e* shows the current proposal, as described in the following chapter of this Scoping Report. Having tested a range of layout options, LRCH considers that this option works with the grain of the site, including its topography, and offers an appropriate balance of amenities inside and outside the two Gates. It also reflects a greater design focus on the functioning of the ‘Conferention’ and eSports Centres (see chapter five) and on the movement of visitors and transport around the site. The option also seeks to provide a greater sense of place than some of the earlier options.

EVALUATION OF ACCESS OPTIONS

4.29 Options for road, rail and river access to the entertainment resort have been evaluated.

Road access

4.30 An explanation of the evolution of the proposed road access arrangements in the light of traffic modelling is provided in the transport chapter of this scoping report. From an early stage it was evident that the local road network would be unable to accommodate construction or operational resort traffic and that a dedicated highway access from the A2(T) to the south was essential. The Ebbsfleet valley between Swanscombe and Northfleet provides an open corridor of land between the A2(T) and Swanscombe Peninsula. With the HS1 railway already in place, the valley is already a transport corridor and is the logical route for a new access road.

4.31 Early assessments of operational traffic volumes indicated that a two lane dual carriageway would be required. Early design work focused on three particular elements:

- **The A2(T) junction** – options for modifying the existing Ebbsfleet junction on the A2(T) to achieve the desired capacity and an effective separation between local and resort traffic.
- **Ebbsfleet Valley** – route options for the access road, taking into account constraints including the Ebbsfleet river and its associated wetland and woodland habitats, existing roads and public rights of way, Ebbsfleet International Station and other HS1 infrastructure, the Baker’s Hole SSSI and scheduled monument, landfill sites, the amenity of residential neighbourhoods on the eastern edge of Swanscombe, and areas of land identified for development.
- **A separate people mover route** to convey visitors between Ebbsfleet International Station and the resort.

4.32 The evolution of these three elements will be discussed in turn. As work on the design of the resort itself progressed, road access to car and coach parks, bus and coach interchanges, hotels and the ‘back of house’ elements of the development was also taken into account.

A2(T) junction options

4.33 It is intended that the primary access for visitors to the Proposed Development will be from the A2(T) via a new and improved junction with the B259. Figure 4.3 a-c shows the principal layout options that have been assessed for the A2(T) junction.

4.34 In 2015 two primary access junction options were considered, utilising a combination of existing highway infrastructure at the A2(T) junction and necessary capacity improvements. The two options that were originally assessed are shown in WSP Drawings

5155-GA-1001 (Option A, figure 4.3a) and 5155-GA-1002 (Option B, figure 4.3b).

- 4.35 Option A comprised a new dual carriageway in the Ebbsfleet valley, connecting directly to the A2(T) via new slip roads and a new gyratory junction. This option enables Resort traffic and the local residential traffic to be segregated by upgrading the existing roundabouts for local traffic and by providing a new dedicated access for the London Resort. Existing roundabouts would be replaced by a new single signalised gyratory to provide additional capacity.
- 4.36 Option B differs by the utilisation of the existing Ebbsfleet Junction eastbound off-slip to accommodate both local and Resort traffic. The layout includes two new gyratories north of the A2(T), one for the Resort traffic only and a second predominantly for local traffic. The Resort gyratory would generally act as free flow in the morning peak hours when most visitors would arrive. When conflicts arise, both gyratories would be signal-controlled to regulate traffic flows and reduce the likelihood of vehicles queuing back onto the A2(T).
- 4.37 Consultations with parties including Highways England and Kent County Council suggested that the introduction of new grade-separated slips would not be accepted as these would create significant departures from established design standards and require significant alterations to the existing power lines located to the north. In response a third option was developed, featuring a significant upgrade of the existing Ebbsfleet Junction (WSP Drawing 0712-SK-201-B, figure 4.3c). This revised arrangement proposes the increase in size of both existing roundabouts into a single signal-controlled gyratory. The proposals include a 'hamburger' style arrangement on the eastern section of the gyratory to improve access into the resort. This scheme will require both Resort and local traffic to use the same road space. However the revised arrangement obviates the need to divert power lines or create new grade-separated roads over the A2.
- 4.38 The access strategy will be formalised based on the forecast visitor and staff numbers expected at the Proposed Development. The refined design will have regard to junction upgrades proposed by Highways England. Both the forecast travel demand and distribution of trips will be modelled (TN1 and TN2). The strategy will be informed further through the strategic modelling undertaken to assess the Development, with sensitivity tests undertaken on numerous sub-options. This will provide an evidence base detailing the preferred access arrangement for the site.

Resort access road route options

- 4.39 A number of route options were considered for the access road between the A2(T) Ebbsfleet junction and Swanscombe Peninsula. In order to maximise the flexibility to use remaining land in the valley for development and open space in accordance with the implementation plan for Ebbsfleet Garden City, routes along the eastern and western sides of the valley corridor were assessed. Table 4.2 summarises the respective benefits and disadvantages of the two options.

Table 4.2 Design considerations raised by eastern and western route options for the Resort access road through the Ebbsfleet valley

Design considerations	Eastern route	Western route
A2(T) junction alignment	The eastern route enables a gentle turning radius and smooth turning movement for traffic entering the access road from the A2(T).	The western route requires all traffic leaving the A2(T) to make a sharp left turn from the slip road.
Integration with local highway infrastructure	The Eastern route facilitates the early separation of resort and local traffic	The division point for resort and local traffic occurs further into Ebbsfleet valley and would involve a greater land-take.
Integration with other resort infrastructure	The eastern route would pass in a cut-and cover tunnel below a proposed resort transport interchange at Ebbsfleet International Station. A separate people mover route would be required from this interchange to the resort. Because the main access road would occupy the space between the Baker’s Hole SSSI and scheduled monument, the people mover route would have to cross the designated areas.	The western route would allow a simpler at-grade construction of a resort transport interchange at Ebbsfleet International Station. The people mover route could pass between HS1 and the Baker’s Hole SSSI and scheduled monument without encroaching on the designated areas.
Gradient	The route follows the alignment of HS1 along the bottom of the Ebbsfleet valley on a broadly level route.	The route crosses undulating higher land on the western side of the valley before dropping to pass beneath North Kent railway and the A226. This would require a cutting into a capped landfill and an embanked section over the former chalk pit to the north.
Construction difficulty	The principal engineering challenge is to avoid compromise to HS1 structures. This will require the road to pass in a cut-and cover tunnel below the proposed resort arrivals concourse at Ebbsfleet International Station. It would	The route would cross the western side of a capped landfill site to the east of Swanscombe. Any road alignment over or along the edge of the landfill would require excavations into the waste relocation of landfill gas and leachate capture and

Design considerations	Eastern route	Western route
	also pass in a cutting close alongside HS1 in order to avoid the Baker's Hole scheduled monument and to minimise land-take from the Baker's Hole SSSI.	monitoring infrastructure. These are both technically complex and would require careful mitigation to control drainage and avoid odour during construction. Measures would also be required to ensure the finished road does not subside as the landfill continues to settle.
Residential amenity during construction and operation	The eastern route would keep the access road as far as possible from existing residential neighbourhoods in Swanscombe, and affords the best protection from noise, dust and air quality effects.	The western route would pass close to existing residential neighbourhoods in Swanscombe, with greater potential for adverse effects on residential amenity, particularly during construction in view of the complexities of working over a capped landfill.
Effects on wider land use	A road alignment running alongside HS1 maximises the flexibility to use remaining land in the valley for development and open space, in accordance with the implementation plan for Ebbsfleet Garden City.	Given the desire to separate resort and local traffic, a western route would complicate the provision of road access to future development in Ebbsfleet Valley, reducing connectivity with existing neighbourhoods and complicating the delivery of Ebbsfleet Development Corporation's Ebbsfleet Central development.

- 4.40 LRCH discussed the technical and environmental challenges of the eastern and western access road options with consultees including the county and local authorities, Ebbsfleet Development Corporation, the Environment Agency, Natural England, Historic England, Highways England, landowners and HS1.
- 4.41 On balance, the western route option was not favoured in view of its convoluted junction arrangement at the A2(T) and the considerable technical and amenity challenge of constructing the road across an undulating landfill site and close to residential neighbourhoods. In operation the western option would bring traffic close to homes on the eastern edge of Swanscombe.
- 4.42 The eastern option was considered to offer a superior balance of benefit, notwithstanding the engineering cost complexity of building the road beneath a resort travel interchange

at Ebbsfleet International Station. The route would allow a superior junction arrangement with the A2(T), would follow an established transport route in the form of HS1 and would largely avoid any incursion into landfilled areas. It would encroach upon the margins of the Baker's Hole SSSI (although not the scheduled monument). However, LRCH is committed to an appropriate package of mitigation including the comprehensive management and interpretation of the Baker's Hole site.

People mover route

- 4.43 A people mover route is required to connect a dedicated Resort travel interchange located to the west of Ebbsfleet International Station to the Leisure Core. The route would be used exclusively by a dedicated fleet of articulated shuttle buses, each with a capacity of 100-150 passengers.
- 4.44 A design challenge presented by the people mover route is the presence of the Baker's Hole SSSI and scheduled monument immediately to the north of Ebbsfleet International Station. In consultation with the local authorities and statutory agencies, LRCH assessed various means of avoiding or minimising harm to the designated sites.
- 4.45 Options considered include a route built above the main resort access road and route options across Baker's Hole. However, this decked option would have required a wider access route corridor to accommodate the structures required to support the people mover route, and would have encroached further into the Baker's Hole designated sites, defeating the object of the exercise.
- 4.46 The solution now proposed involves a people mover route comprising a lightweight road laid on the surface of Baker's Hole, with minimal ground penetration to avoid disturbance to the geological and Palaeolithic features that justify the protection of the site. From the proposed travel interchange the route would cross the designated area and then follow a course along the eastern edge of Baker's Hole. To facilitate its future removal or realignment, the people mover route would not be adopted as public highway.
- 4.47 The Preliminary Environmental Information Report (PEIR) and ES for the project will explain in detail the measures proposed to safeguard and manage the Baker's Hole SSSI and scheduled monument.

Rail access

- 4.48 As explained earlier in this chapter, the presence of Ebbsfleet International Station was an important consideration in the selection of the Swanscombe Peninsula site for the Entertainment Resort. A further advantage of the Swanscombe site is its proximity to the North Kent line, which provides suburban train services into London.
- 4.49 There are three local stations on the North Kent line: Greenhithe station 2 km to the west of the peninsula, Swanscombe station on the southern edge of the peninsula and Northfleet station c. 1 km to the south-east. In dialogue with Network Rail, LRCH has

investigated the potential of each of these stations to accommodate Resort visitors whilst continuing to cater for existing rail passengers.

- 4.50 Although Swanscombe station would be closest to the Resort, its location in a confined cutting does not facilitate improvements to station capacity or the provision of facilities for mobility-impaired visitors. In contrast, Greenhithe station is an at-grade facility with lifts from platform level to a covered pedestrian bridge and several bus stop bays. For these reasons it is proposed that Resort visitors arriving on the North Kent line will be encouraged to alight at Greenhithe station, from where a *Fastrack* or shuttle bus service would convey them to and from the Resort. Visitors preferring to use Swanscombe station will be able to walk down an enhanced Pilgrims' Way pedestrian route to the Resort's leisure core, and Northfleet station is only a short walk from the proposed Resort transport hub next to Ebbsfleet International Station.
- 4.51 One of the routes under consideration for a future extension of the Elizabeth Line (Crossrail) would terminate at Ebbsfleet International Station. Although the London Resort's transport strategy does not rely upon this additional transport option it would clearly provide a further connectivity enhancement in the long term.

River access

- 4.52 The location of the Swanscombe Peninsula beside the River Thames is recognised as a further important asset of the site. LRCH has identified opportunities for using river transport during the construction and operation of the Resort. Once upgraded it is proposed that the existing Bell's Wharf on the north-western shore of the peninsula will be used for these purposes.
- 4.53 Following discussions with parties including the Port of London Authority, the Marine Management Organisation, the Port of Tilbury and river boat operator Thames Clippers, LRCH proposes the following arrangements for river transport.
- Construction materials will be supplied to the site by boat from the Port of Tilbury, using Bell's Wharf, which would be reconditioned. By these means it is hoped that up to 95% of construction materials can be delivered to the resort site by river. Construction waste would be removed from the site by the same route.
 - The Thames Clippers passenger ferry services from central London, Tilbury and possibly Grays would use a new floating pontoon jetty extending from the shore beside Bell's Wharf. Up to 15% of visitors are projected to use this means of travel to and from the Resort from central London.
- 4.54 The dedicated car and coach parking and passenger ferry facilities now proposed at the Port of Tilbury represent a reinforcement of LRCH's commitment to river transport and will reduce road traffic generation on the Thames crossings.

CONCLUSION

- 4.55 In proposing to make a major investment in an entertainment resort with a global profile, LRCH wants to be certain that it has selected the best site with a leading range of resort attractions, supported by a comprehensive transport strategy. The identification and testing of options, supported by several rounds of consultation, has been an integral component of the design process for the London Resort, giving cause for confidence that the project will be deliverable and viable.
- 4.56 The future PEIR and ES for the project will provide a more detailed explanation as to how the resort proposals have evolved, with further consideration for design refinement and environmental mitigation.



Project Site

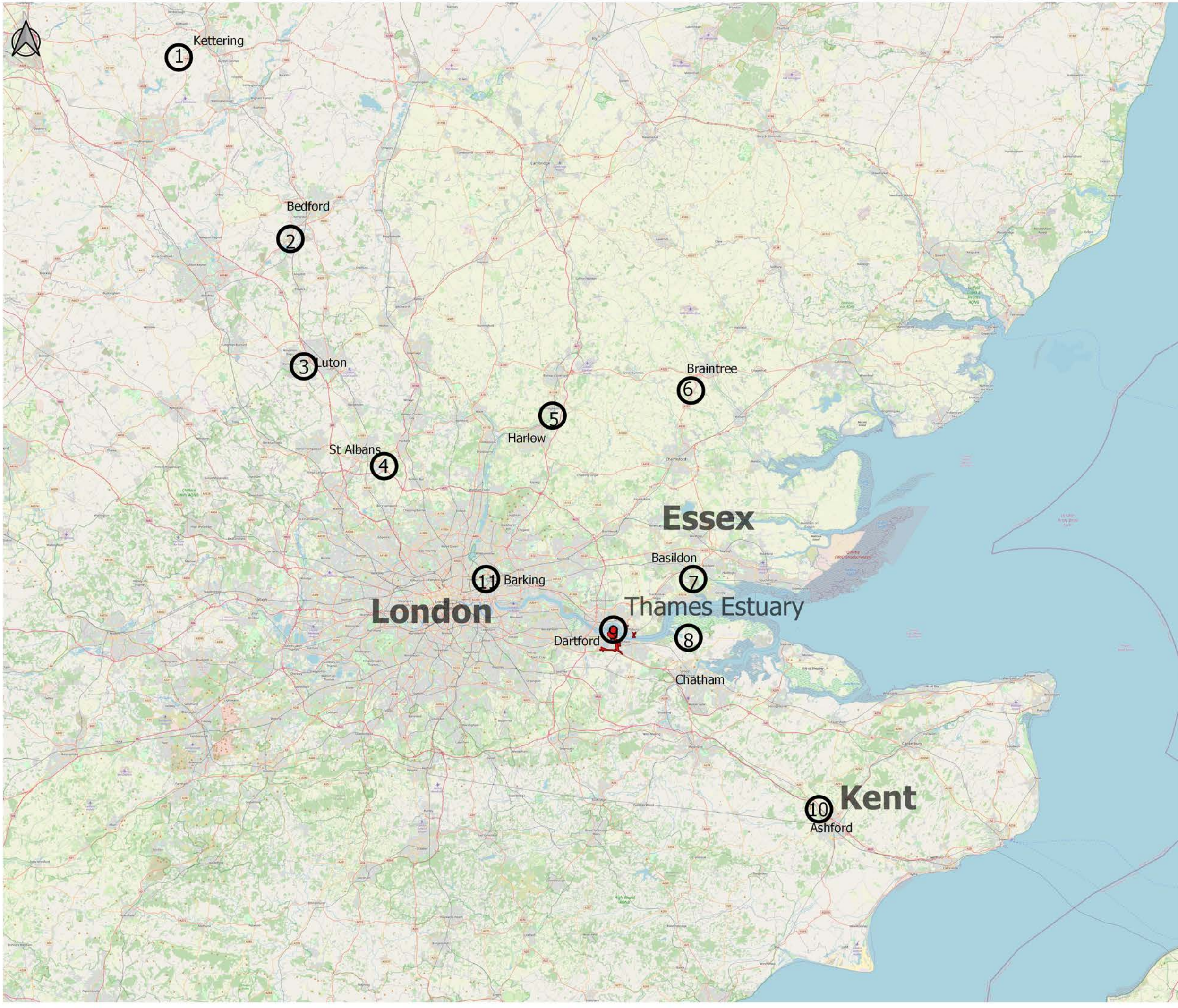
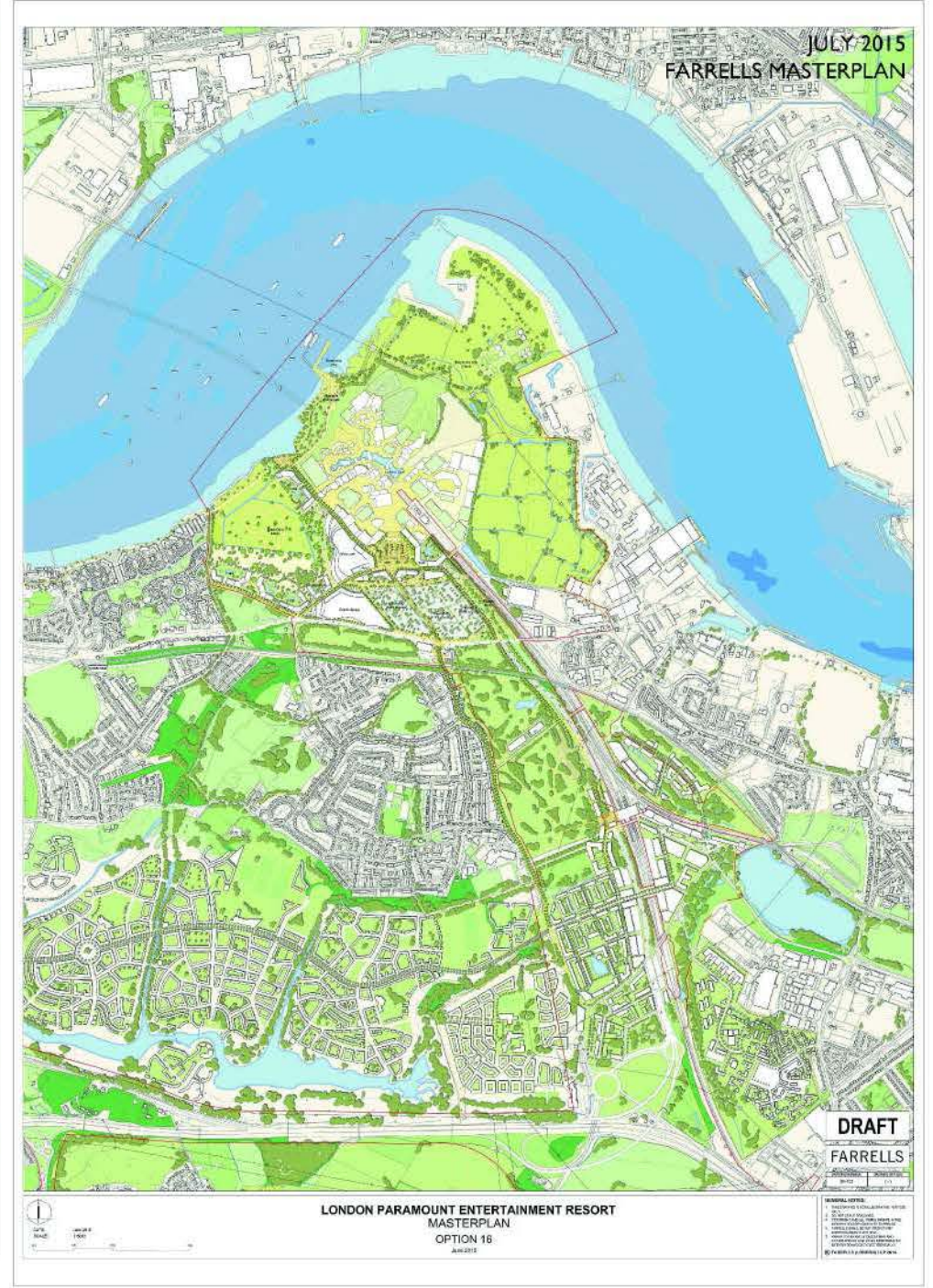
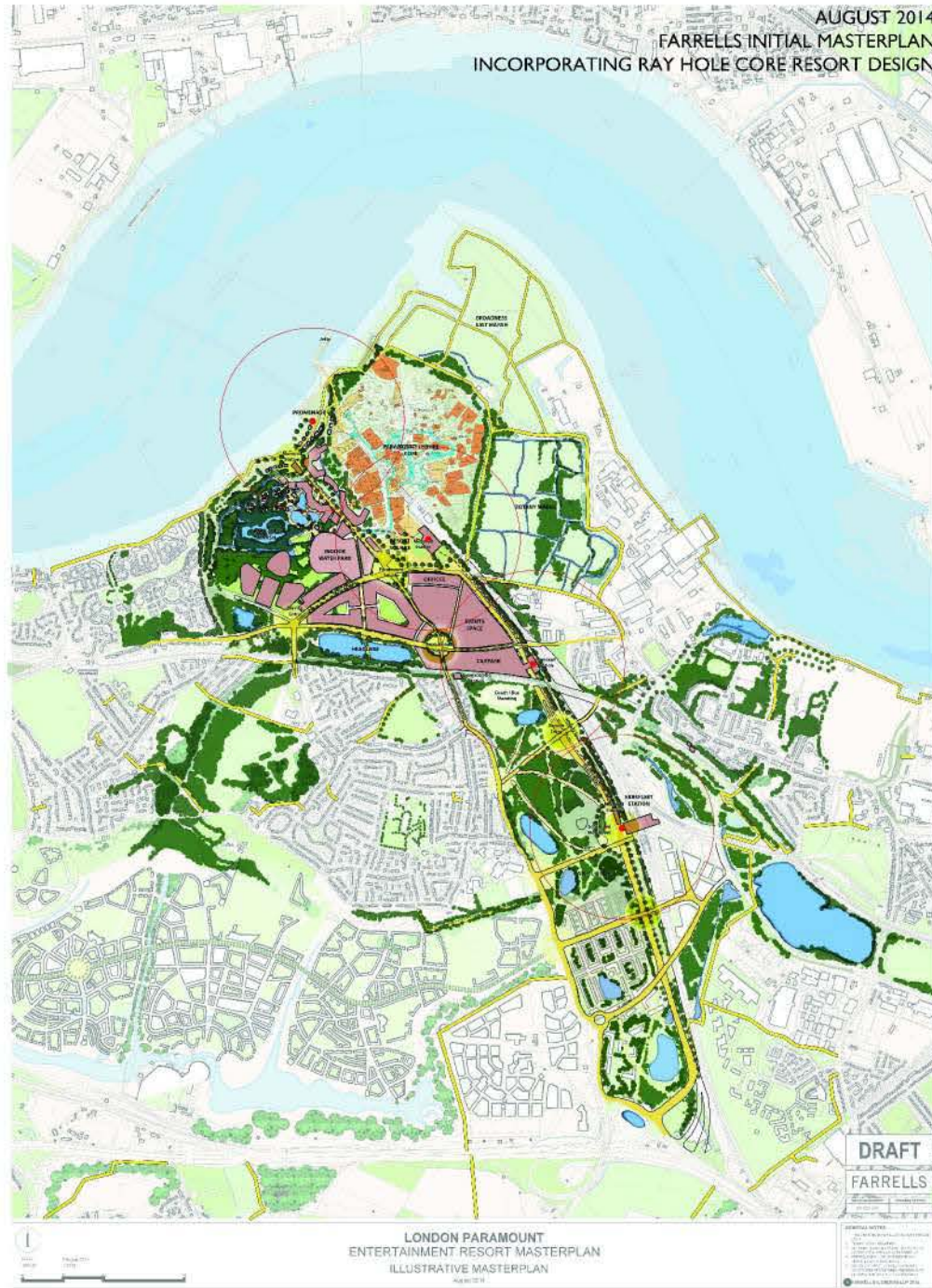
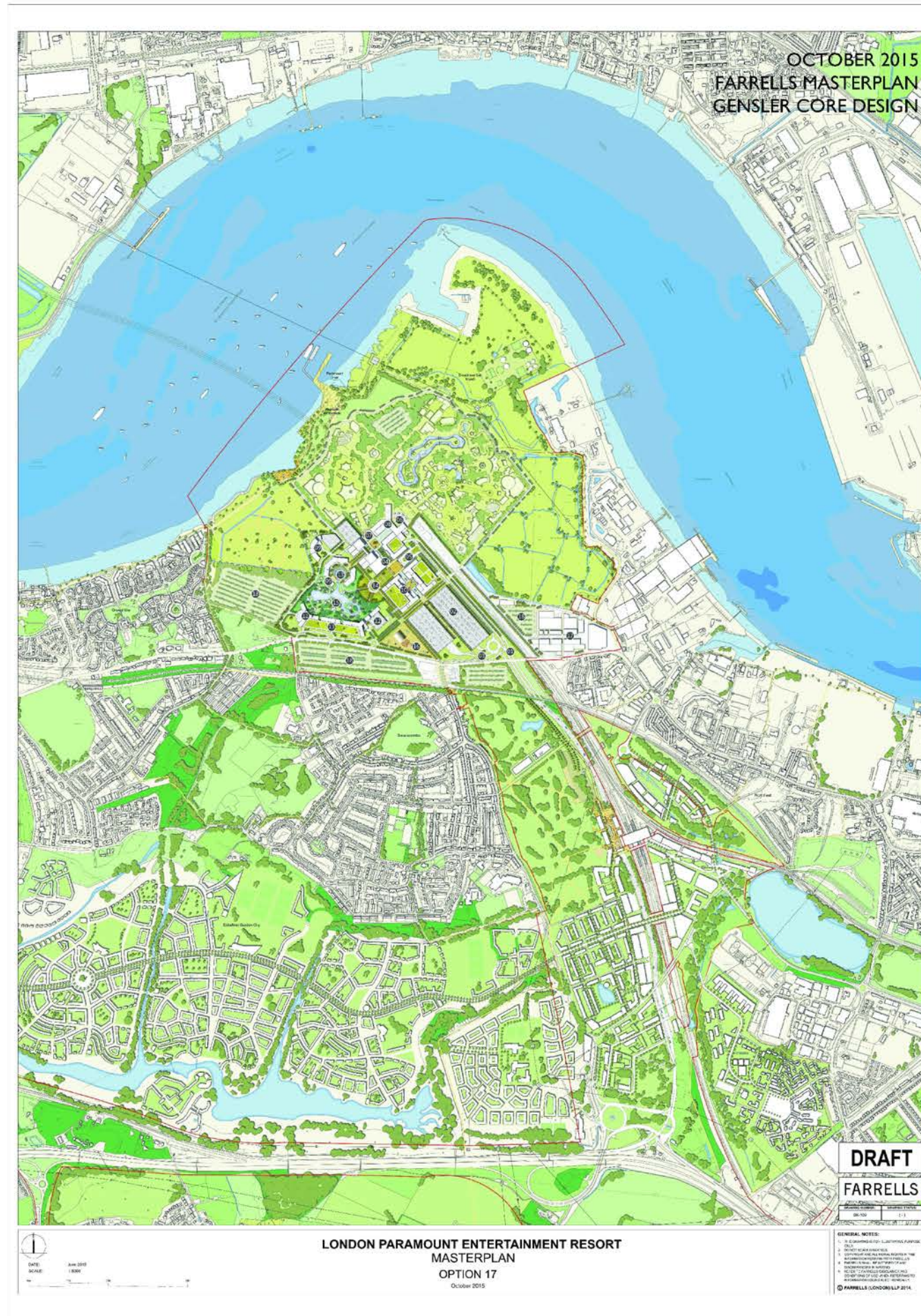


Figure 4.2a - Draft Masterplans



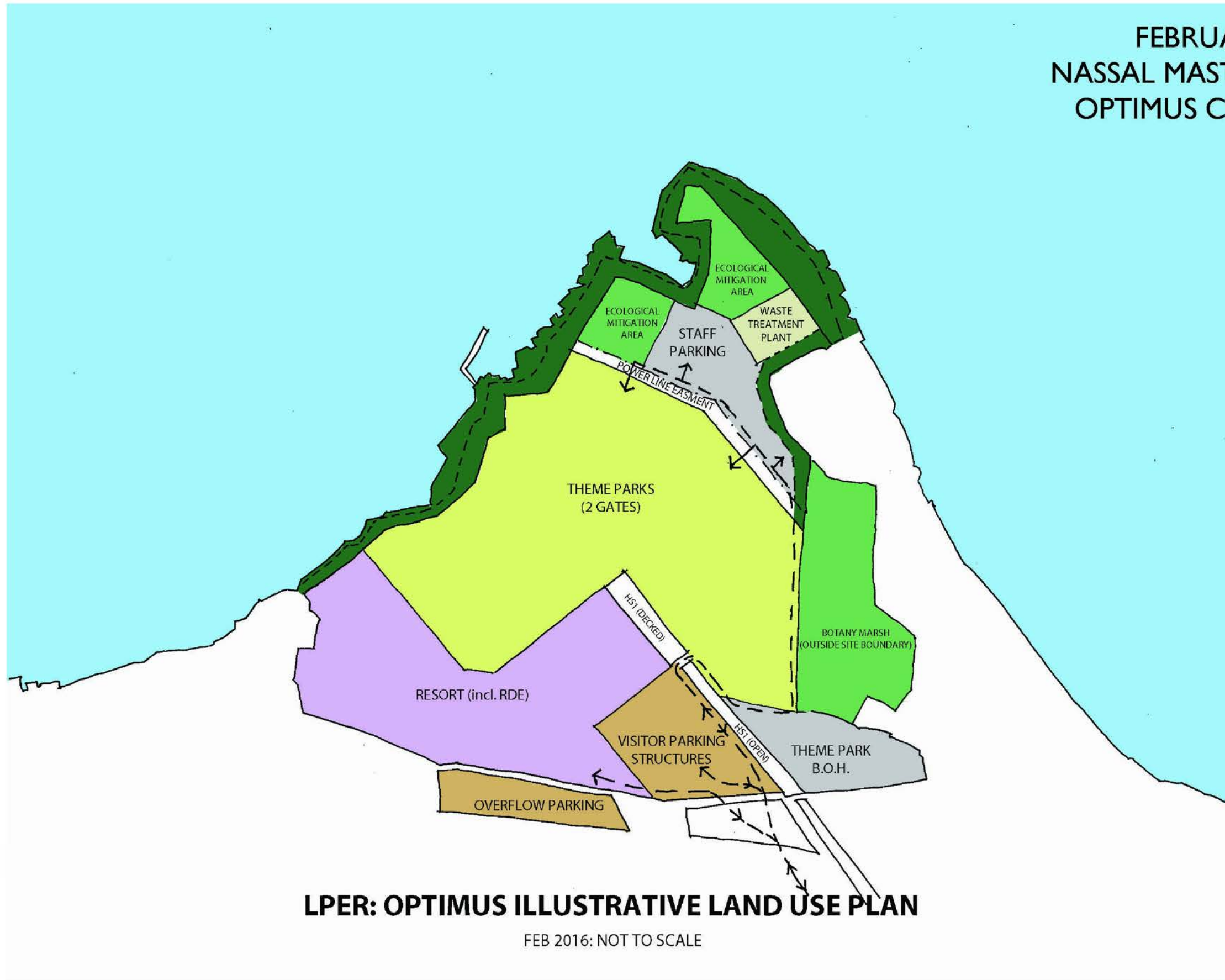
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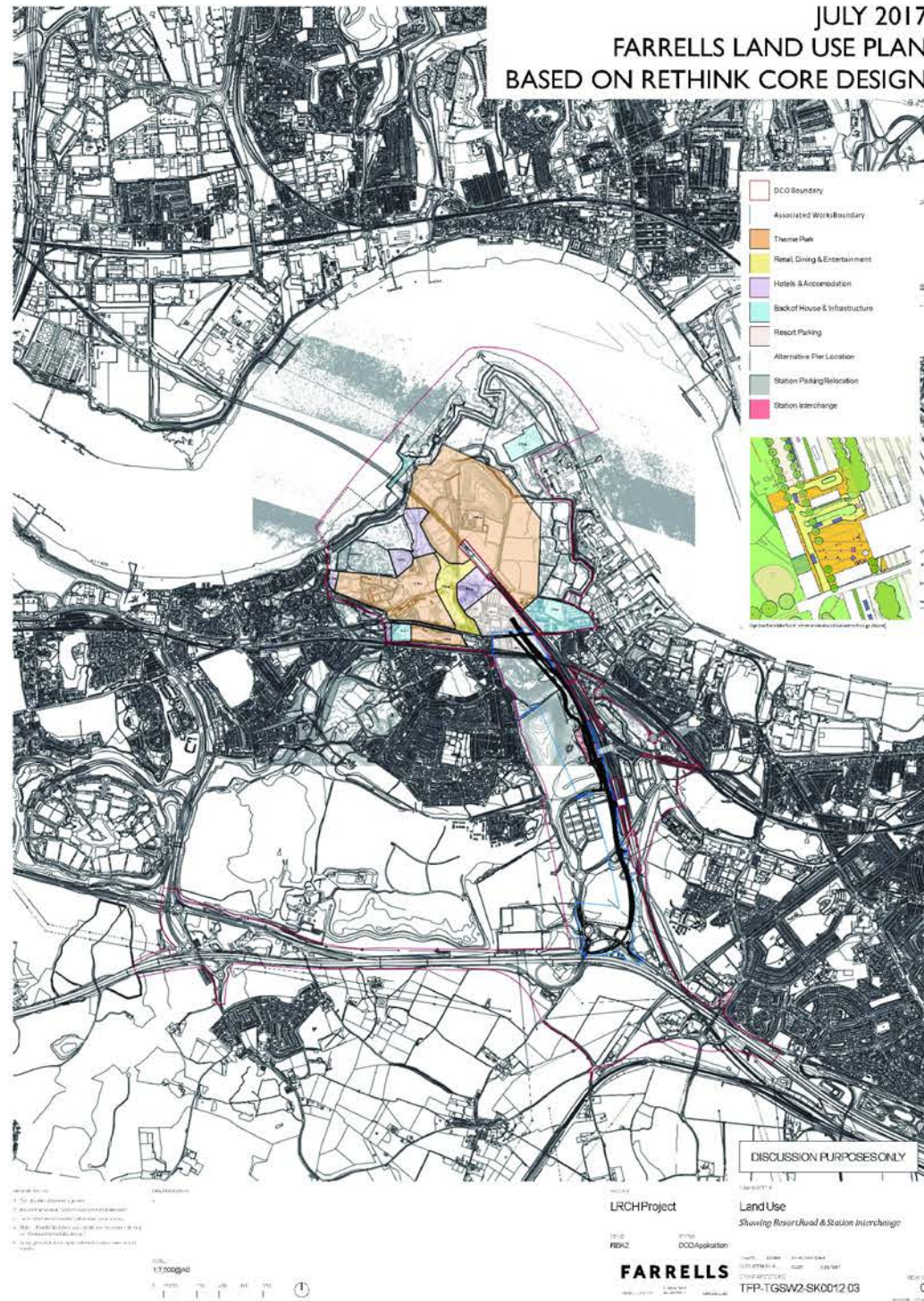


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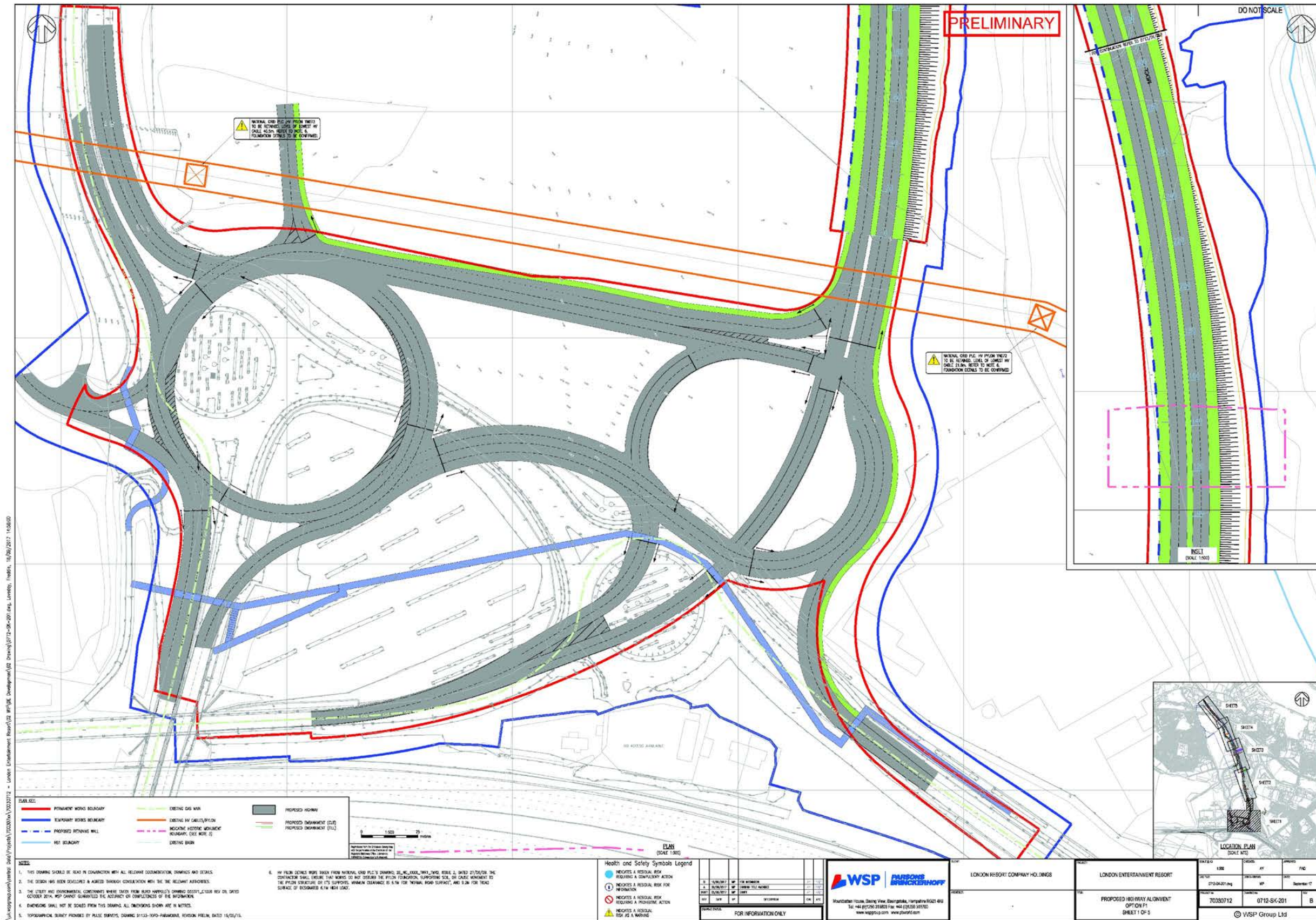


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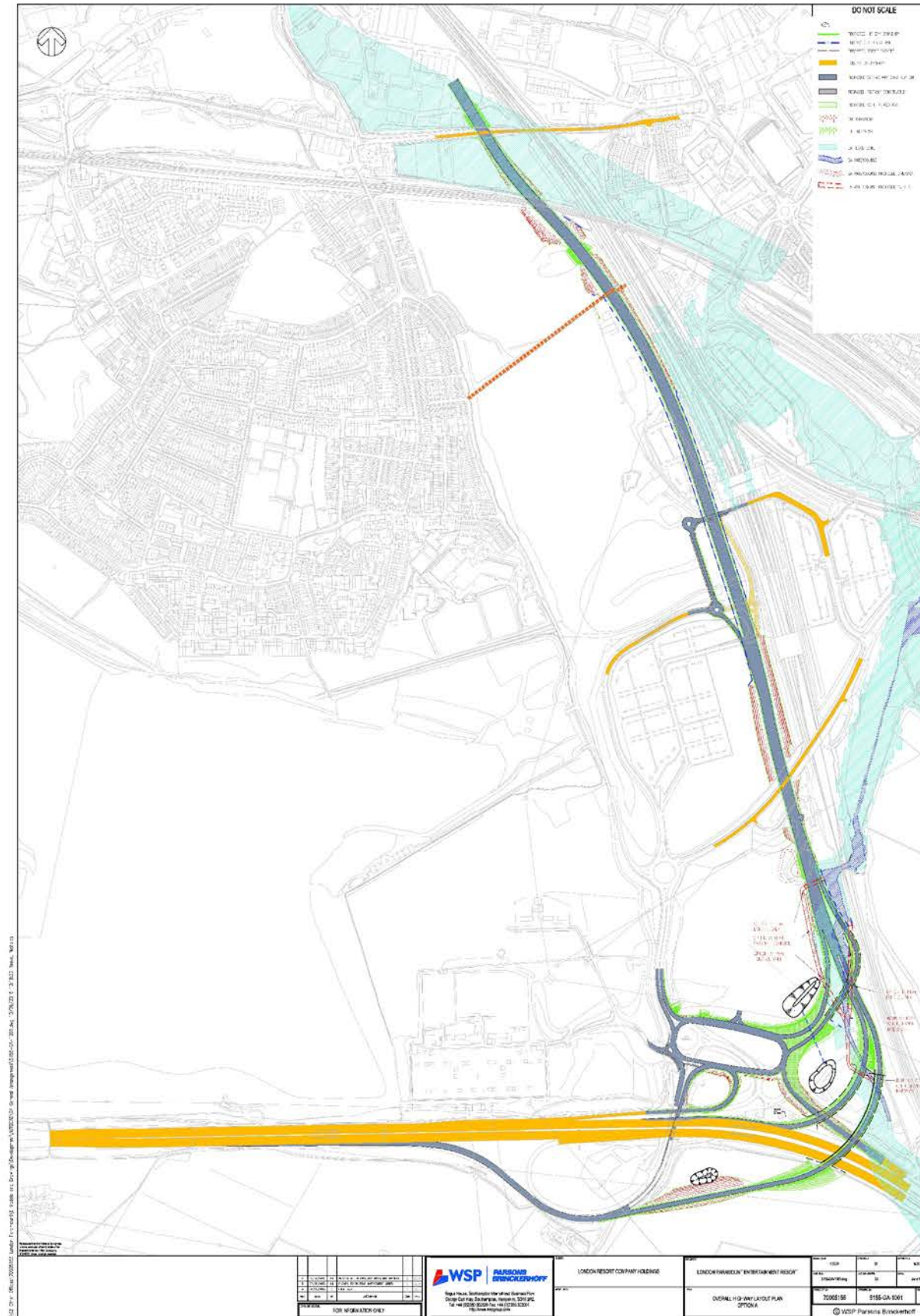


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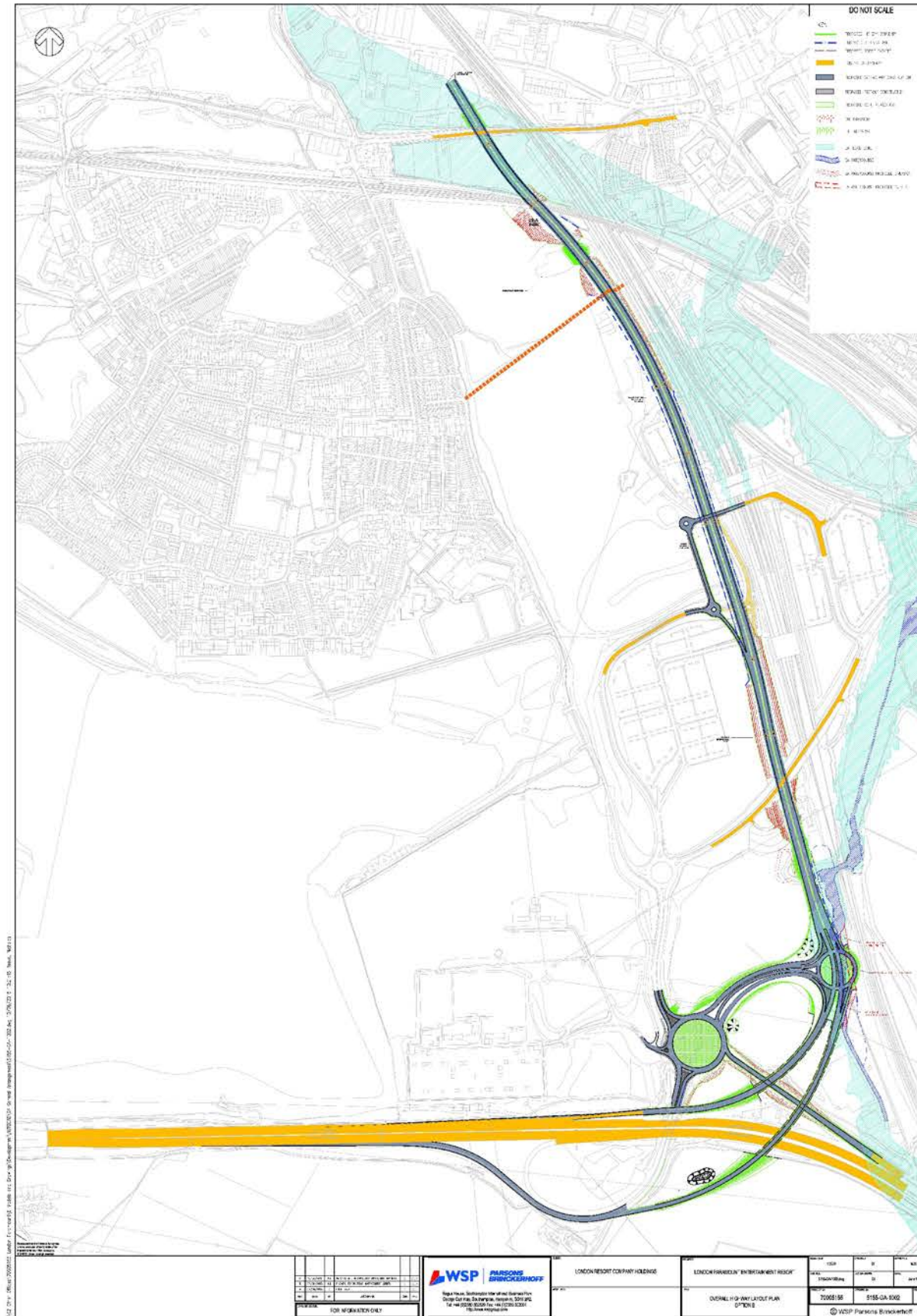


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Ref: Figure 4.3b - Highway and junction access options from the A2(T) - 5155-GA-1001-C
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Figure 4.3c - Highway and junction access options from the A2(T) - 5155-GA-1002- Option B



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Five ◆ Site and project description

INTRODUCTION

- 5.1 This chapter provides a description of the Project Site and the Proposed Development. It begins with an account of the site context.

SITE CONTEXT

Location

- 5.2 The Project Site lies approximately 30 km east-south-east of central London on the south and north banks of the River Thames, in the counties of Kent and Essex. On the south side of the Thames the Project Site occupies much of the Swanscombe Peninsula, formed by a meander in the river, and includes a corridor for transport connections extending generally southwards to the A2(T) trunk road. On the northern side of the river the Project Site includes areas of land east of the A1089 Ferry Road and the Tilbury Ferry Terminal, which currently provides passenger services across the river to Gravesend and incorporates the London International Cruise Terminal.
- 5.3 For clarity the section of the Project Site to the south of the Thames is referred to in this report as the 'Kent Project Site' and that to the north of the river is identified as the 'Essex Project Site'. The sites are identified in Figures 5.1 and 5.2. They are not contiguous.

The local context: Kent

- 5.4 The Kent Project Site is bisected by the municipal boundary between the boroughs of Dartford to the west and Gravesham to the east. It lies mostly in the designated area of the Ebbsfleet Garden City, established in March 2015. The urban areas of Stone, Greenhithe, Ingress Park and Swanscombe lie to the west and south of the site. These are largely residential in character, with commercial uses concentrated on Stone's river frontage. To the east of the Kent Project Site lies Northfleet, a neighbourhood of mixed residential and commercial uses.
- 5.5 Each of these settlements has a district centre providing community, retail and commercial services. The locality is also served by the principal town centres in the two boroughs, at Dartford and Gravesend (in Gravesham). Beyond Greenhithe to the south-west of the Kent Project Site lies Bluewater Shopping Centre. This is a significant retail development that provides 154,000 m² of retail floorspace and 13,000 car parking spaces on a 97 ha site. In April 2017, Dartford BC resolved to grant planning permission for an expansion in total retail and catering floorspace of up to 30,000 m². Car parking at the centre would be maintained at current levels. Construction work on the extension has yet

to commence.

- 5.6 To the south of the A2(T) the land is more open and rural in character, with small settlements amid farmland and woodland blocks. Most of this area lies in the metropolitan green belt.
- 5.7 The principal rail links in the locality include the High Speed One (HS1) railway, which provides high-speed connections between London and various destinations in Kent and Eurostar train connections between London, Paris, Brussels and other European cities. Ebbsfleet International Station is located to the south of Swanscombe Peninsula. The railway passes partly in cutting and partly in a tunnel beneath Swanscombe Peninsula *en route* to and from London St Pancras International Station.
- 5.8 The North Kent Line, which crosses the southern edge of the Swanscombe Peninsula in an east-west direction, provides local services between London and North Kent and onwards to the Kent coastal towns by way of the Kent Coast Line, with nearby stations at Greenhithe, Swanscombe and Northfleet. All three stations are located outside of the Kent Project Site.
- 5.9 Strategic highway routes in the locality include the A2(T), which provides a connection between Junction 2 of the M25 motorway to the west and Junction 1 of the M2 motorway beyond Gravesend to the east. The Dartford Tunnels and Queen Elizabeth II Bridge crossings of the River Thames lie approximately 3km to the west of the Project Site. Highways England has consulted on options for a new road between Kent and Essex, known as the Lower Thames Crossing. On 12 April 2017 the Secretary of State for Transport announced that the preferred route for the Lower Thames Crossing is a bored tunnel passing under the River Thames east of Gravesend and Tilbury. A Development Consent Order (DCO) application for the Lower Thames Crossing is due to be submitted later in 2020.
- 5.10 The principal local roads adjacent to the Kent Project Site include the A226 London Road / Galley Hill Road that runs east-west across the southern side of the Swanscombe Peninsula, with the B255, B259 Southfleet Road and the B262 / A2260 Springhead Road providing north-south links between the A226 and the A2(T).
- 5.11 The locality has a distinctive landform, modified by human activity. From the low-lying southern bank of the Thames the terrain generally rises southwards to a ridge that is typically 25m above ordnance datum (AOD). However, the natural topography has been altered considerably by extensive mineral workings – principally the quarrying of chalk for the manufacture of cement and other building products. The extensive voids created by mineral extraction include Eastern Quarry to the south-west of the Kent Project Site, which is being developed as a new residential neighbourhood as part of the Ebbsfleet Garden City initiative established by the Ministry of Housing, Communities and Local Government (MHCLG). Some of these former chalk pits have also been used for waste landfill, including an area to the west of HS1 within the Project Site. Areas of the peninsula have been tipped with substantial quantities of cement kiln dust (CKD), a by-product of the cement industry.

In places this this material has been over-tipped with dredgings from the River Thames.

The local context: Essex

- 5.12 The north bank of the River Thames opposite Swanscombe Peninsula is also extensively developed. Local settlements include West Thurrock, South Stifford, Grays and, to the north-east, the major port and town of Tilbury.
- 5.13 The Essex Project Site lies immediately to the east of the port of Tilbury in the unitary borough of Thurrock. Tilbury is London's primary operational port and offers over 10 km of quayside providing 56 operational births, supported by 465,000 m² of warehouse floorspace. The port handles a range of cargoes including ro-ro, container, wood and paper products, grain and liquid and dry bulk materials. Where not developed for warehousing, the port is mostly hard-surfaced to accommodate the storage and movement of vehicles, containers and bulk materials.
- 5.14 On the bank of the Thames along the southern edge of the port stand four wind turbines operated by Scottish Equity Partners. The turbines have a maximum height to blade tip of c. 135 metres and together have a generation capacity of 9.2 megawatts (MW).
- 5.15 At the south-east corner of the Port lies the Tilbury Ferry Terminal incorporating the London International Cruise Terminal. The cruise terminal comprises a restored grade II* listed two-storey building and a large floating landing stage extending out into the river, connected to the land by a series of bridge structures. The landing stage is included in the statutory listing. Passenger ferries to Gravesend operate from the eastern part of the terminal, which also accommodates an arts activity centre.
- 5.16 In February 2019 the Secretary of State for Transport made a DCO for a new port 2 km to the east of Tilbury port, known as Tilbury2, following an application by Port of Tilbury London Limited. This development occupies the site of the former Tilbury Power Station and will include a Roll-on/Roll-off (RoRo) terminal and a Construction Materials and Aggregates Terminal (CMAT), with associated infrastructure including rail and road facilities and modifications to the existing marine infrastructure. The CMAT will be used for the stockpiling of construction materials and some processing of aggregates for the production of asphalt and concrete products.
- 5.17 Construction of Tilbury2 is underway. The development will incorporate extensive hard-surfaced pavements, extensions to the existing river jetty including creation of a new RoRo berth; new conveyors and material handling, the erection of welfare and ancillary buildings, a new 10,200 m² warehouse, a new link road from Ferry Road to Fort Road and the formation of a rail spur and sidings. The effect of these proposals will be to provide a new deep-sea jetty and increase the size of the port of Tilbury from a land area of around 383 ha to 445 ha.
- 5.18 As will be explained in further detail, the Essex Project Site lies between the ports of Tilbury and Tilbury 2. More generally the proximity of CMAT to the Entertainment Resort

should significantly facilitate the construction of the Resort, amongst other things enabling construction materials to be delivered in bulk by barge and reducing construction road traffic.

- 5.19 Local settlements include the towns of Tilbury 1 km to the north of the ferry terminal, Chadwell St Mary a further 2 km to the north and the larger urban area of Grays 4 km to the north-west. Strategic road access is provided by the A1089 Dock Approach Road / Dock Road / Ferry Road, which connects to the main A13 east-west route to the M25 motorway and London beyond. The surrounding countryside is either flat or gently undulating and features prominent high voltage electricity transmission lines, generally running in parallel pairs.
- 5.20 Tilbury lies on the railway between Southend-on-Sea and London Fenchurch Street, which passes through West Ham station at which passengers can connect to the District and Hammersmith and City lines on the London Underground and the Docklands Light Railway network. Tilbury railway station is 1.5 km from the ferry terminal.
- 5.21 Between the Essex Project Site and Tilbury2 lies Tilbury Fort, a star-shaped fortification managed by English Heritage and a popular local visitor destination. The fort originated in Tudor times and features angular bastions, moats and lines of guns facing onto the Thames. The site is a Scheduled Monument and contains a grade II* listed barracks.

THE PROJECT SITES

The Kent Project Site

- 5.22 The Kent Project Site comprises approximately 504 hectares of land in a complex shape, shown in Figure 5.1. It includes land on and to the south of the Swanscombe Peninsula on which the Resort and its main public transport interchange would be focused, and a corridor of land required for road connections running in a broadly north-south direction between the Peninsula and the A2(T). The Kent Project Site also includes a section of the A2(T) corridor approximately 3.5 km in length between the established junctions at Bean in the west (A2(T) / B255) and Pepper Hill (A2(T) / B262) in the east.
- 5.23 The Ordnance Survey grid references for the approximate extremities of the Swanscombe Peninsula and the Access Corridor are as follows (expressed as eastings and northings):

Swanscombe Peninsula

- 559422, 175612
- 561348, 176278
- 559900, 174834

- 561333, 174940

Land between Swanscombe Station and the A2(T)

- 560619, 174862
- 561144, 174666
- 560981, 172762
- 561884, 172539

A2(T) corridor

- 558395, 173177
- 558222, 172566
- 562583, 172073
- 562510, 171970

- 5.24 The majority of the Kent Project Site on the Swanscombe Peninsula comprises open, low-lying land with extensive former CKD tips and other brownfield former industrial land. A number of drains, filtration systems, aeration lagoons and other features are also present. Much of the peninsula has re-vegetated naturally but areas of bare ground remain. Other parts of the Kent Project Site on the Swanscombe Peninsula include the existing Manor Way, Northfleet and Kent Kraft industrial estates.
- 5.25 The HS1 railway crosses the Peninsula on a south-east to north-westerly alignment. The southern section is in cutting and the remainder in a tunnel. A pumping station that serves to lower ground water adjacent to the tunnel is located to the north-east of the tunnel portal.
- 5.26 The Swanscombe Peninsula supports extensive areas of marshland including Black Duck Marsh, Botany Marsh and a marsh around the HS1 tunnel portal. Broadness Marsh at the northern tip of the Peninsula was historically a saltmarsh, but now has a raised terrain as a result of CKD tipping and the deposition of river dredgings. Broadness and Botany Marshes are bordered in part by industrial uses.
- 5.27 The Peninsula has an irregular topography because of historical CKD tipping activities and the deposition of dredgings from the River Thames. Two raised areas of tipped material rise to over 12-13 m above ordnance datum (AOD). A large part of the north of the Peninsula has been raised from an assumed original *height of 2-3 m AOD to approximately 8.75 m AOD. Where it meets the River Thames, the Peninsula is surrounded by flood*

defence embankments and terraces that rise to approximately six metres AOD. Small areas of remnant salt marsh are located at the base of the flood defences.

- 5.28 In terms of its underlying geology, the Kent Project Site lies in the eastern part of the London Basin, which is underlain by chalk. This chalk is designated by the Environment Agency as a principal aquifer and is the main source of potable water in the area. The majority of the Kent Project Site thus lies within a groundwater Source Protection Zone (SPZ). The Peninsula itself is overlain by alluvium, comprising silts and clays.
- 5.29 The banks of the Peninsula feature occasional jetties and inlets, some of which are used for the mooring and landing of boats. An inlet at the northern end of the Peninsula, known as Broadness Creek, has associated boat sheds. A small number of public footpaths cross the Kent Project Site including Saxon Way, which runs along the western flood embankment.
- 5.30 High voltage electricity transmission lines cross the Peninsula on a south-east to north-westerly alignment, and include a 190 m tall 'super pylon' that lifts the transmission lines over the Thames to a similar tower on the northern bank. These lattice towers are the UK's tallest electricity pylons and are prominent local landmarks.
- 5.31 North of the HS1 tunnel portal is a derelict wastewater treatment works. A Port of London Authority radar beacon is located near the northern tip of the Peninsula.
- 5.32 Natural habitats on the Kent Project Site include patches of woodland, scattered areas of scrub and improved and semi-improved grassland. Wetland habitats include wet grasslands at Black Duck Marsh and grazing marsh and reed beds in Black Duck and Botany Marshes, with ponds of standing open water and drainage ditches. There are also fragments of saltmarsh and mudflats within the flood defence embankments.
- 5.33 The Kent Project Site does not contain any international or national wildlife designations. Part of the Ebbsfleet Marshes Local Wildlife Site (LWS TQ 619738), which includes wet woodland and reed beds, is located in the Ebbsfleet Valley section of the Kent Project Site.
- 5.34 Areas of degraded post-industrial land, including disused pits and landfilled areas supporting mostly grassland and scrub, are present across the section of the Kent Project Site that extends southward towards the A2(T). This area also contains a large surface level car park and associated roads serving Ebbsfleet International Station.
- 5.35 The A2(T) / A2260 junction (referred to here as Ebbsfleet Junction) allows eastbound and westbound traffic to leave and join the A2(T) at the southern end of the Kent Project Site. Springhead Nurseries and the HS1 railway are located to the immediate east of the A2(T) / A2260. A large electricity compound is located immediately to the west although part of this is no longer in use and the site is currently being developed for housing, a school and a hotel.
- 5.36 The Pepper Hill (A2(T) / B262) junction provides access to Northfleet to the north and

Northfleet Green, Southfleet and Betsham to the south. The (A2(T) / B255) junction at Bean provides connections to Stone and Greenhithe via the B255 and the A296. Blocks of woodland border the A2(T) at the A2(T) / B255 junction. Bluewater Shopping Centre is located less than 1km from this junction and is reached directly from the B255. At Greenhithe the B255 connects to the A226, which provides access to the Swanscombe Peninsula from the west.

The Essex Project Site

- 5.37 The Essex Project Site comprises approximately 29.9 hectares of land in a complex shape, shown in Figure 5.2. It includes the following main elements.
- A trapezoidal area of level hard-surfaced land approximately 11.75 ha in area, used currently for vehicle storage. The Essex Project Site is bounded by railways on its northern and western sides, and a drainage channel to the east. Road access is gained from Fort Road at the south-eastern corner of the Essex Project Site. To the south lies Tilbury Railport, a large logistics shed with railway sidings operated by Maritime Transport Limited.
 - An irregular strip of land along the corridor of the A1089 Ferry Road, including areas of vegetation and hardstandings, and along the corridor of Fort Road to the east and far as the entrance into the main car storage site described in the previous bullet.
 - The Tilbury Ferry Terminal and the eastern half of the floating landing stage out in the river, including connecting bridges and a small triangular area of open space to the east.
 - The Asda Roundabout on the A1089 to the north. This roundabout forms the junction between the A1089 St Andrews Road / Dock Road, Windrush Road and Thurrock Park Way, the latter of which serves an Asda superstore. This junction has been included in the draft Order Limits for the London Resort DCO in case that traffic assessment reveals a need for physical highway enhancements.
- 5.38 As explained in more detail in the cultural heritage chapter of this EIA scoping report, the London International Cruise Terminal, the passenger ferry terminal and the floating landing stage that serves both are together listed grade II*. The landing stage was designed by the Port of London Authority's architect Sir Edwin Cooper and was officially opened in 1930 by Prime Minister J Ramsey MacDonald. In June 1948 the SS Empire Windrush docked at the landing stage with 500 migrants on its first voyage from the Caribbean.
- 5.39 The Ordnance Survey grid references for the approximate extremities of the Essex Project Site are as follows (expressed as eastings and northings):
- 564106, 175847
 - 564797, 175937

- 564230, 174978
- 564751, 175016

Asda Roundabout

- 563193, 177107
- 563233, 177105
- 563182, 176902
- 563286, 176933

PROJECT DESCRIPTION

Overview of the Proposed Development

- 5.40 The 2008 Act provides that development consent may be granted for both a Nationally Significant Infrastructure Project (NSIP), referred to as the ‘Principal Development’ in this document, and for ‘Associated Development’, which is development associated with the Principal Development. The Housing and Planning Act 2016 enabled DCO development to be accompanied by ‘Related Housing’, defined by functional need or geographical proximity, with a guideline maximum of 500 homes to be consented by this means.
- 5.41 In the description of development below, a distinction is made between the Principal Development, which comprises all works proposed within what would be the Entertainment Resort, and Associated Development, comprising other development that has a direct relationship with the Principal Development and is required to support its construction or operation ¹.
- 5.42 Certain works to the A2(T), described in detail in Chapter 9 of this EIA scoping report, might comprise a nationally significant infrastructure project in their own right under s.22 of the 2008 Act. Whilst these works are ‘associated’ with the Principal Development, they are referred to as the ‘A2 Highways Works’ for the sake of clarity in this EIA scoping report.
- 5.43 In summary, the ***Principal Development*** includes:
- land remediation works;
 - the Leisure Core, comprising a range of events spaces, themed rides and attractions,

¹ Associated development is defined within Annex A of the Department for Communities and Local Government *Guidance on associated development applications for major infrastructure projects* (April 2013)

entertainment venues, theatres and cinemas, developed in landscaped settings in two phases known as Gate One and Gate Two. The Gates will have entrance plazas offering ancillary retail, dining and entertainment facilities;

- terrain remodelling, landscape works and planting;
- the A2 Highways Works comprising a signalised at-grade gyratory junction to replace two existing roundabouts at the A2(T) / B259 junction.

5.44 The ***Associated Development*** includes:

- four hotels providing family, upmarket, luxury and themed accommodation totalling up to 3,550 suites or 'keys'. One or more of these hotels might be located within the leisure core. One hotel will incorporate a water park;
- a 'Conferention' Centre (i.e. combined conference and convention) with a floor area of up to 11,000 m², capable of hosting a wide range of entertainment, sporting, exhibition and business events;
- a linked building hosting a range of eSports, video and computer gaming events, with a total floorspace of up to 16,500 m²;
- a 'Back of House' area accommodating many of the necessary supporting technical and logistical operations to enable the Entertainment Resort to function, including security command and crisis centre, maintenance facilities, costuming, employee administration, employee welfare, medical facilities, offices and storage;
- a people mover and transport interchanges;
- a Resort access road of up to four lanes (i.e. up to two lanes in each direction);
- car parks with an overall volume of 10,750 spaces;
- local transport links,
- river transport infrastructure on both sides of the Thames, including floating jetty and ferry terminals and the repair or replacement of White's Jetty;
- utility compounds, plant and service infrastructure;
- flood defence and drainage works;
- habitat creation and enhancement and public access;
- security and safety provisions;

- data centres to support the Resort requirements

- 5.45 **Related Housing** comprising up to 500 apartments for Resort workers. The apartments will typically have 4-6 bedrooms and shared kitchen and lounge facilities.
- 5.46 The Principal Development, Associated Development and Related Housing are described below. All floorspace areas cited below are Gross External Areas. An illustrative master plan of the Proposed Development is provided at Figure 5.3. A land-uses plan is included at Figure 5.4.
- 5.47 The DCO must be sufficiently flexible to enable changes to occur post-consent. The DCO application will therefore be based on parameter plans and work within 'Rochdale Envelope' parameters, as explained in chapter one of this document.

Principal Development

Land remediation

- 5.48 The DCO will provide for the remediation of contaminated areas of the Kent and Essex Project Sites, including the capping of CKD and contaminated river dredgings, the removal or improved treatment and management of industrial waste tips and the profiling of land for the purposes of the development.

The Leisure Core

- 5.49 At the heart of the Proposed Development on the Kent Project Site will be a range of entertainment experiences in a series of themed zones, incorporating events spaces, themed rides and attractions, entertainment venues, cinema and theatres. These will be developed on the Swanscombe Peninsula in two phases, comprising a 57 ha area known as Gate One and a 25 ha area known as Gate Two, with each phase subdivided into themed zones. These will reflect agreements with intellectual property (IP) providers and will include rides and attractions suitable for families, children and the more adventurous thrill-seeking visitor. As noted, the content of the zones will be changed or updated from time to time in line with evolving market demand and the draft DCO will incorporate the flexibility to do this.
- 5.50 Retail and amenity facilities, including a range of restaurants, cafes and coffee shops linked to the Resort experience, will be integrated into Gates One and Two for the enjoyment and convenience of visitors. The Gates might also incorporate some of the Resort's hotel accommodation.
- 5.51 Adjacent to the entrance plazas outside of Gates One and Two, up to 26,000 m² of ancillary retail, dining and entertainment (RDE) floorspace and supporting attractions will be provided in a 8 ha area, excluding hotels. In conjunction with these RDE facilities the entrance plazas will establish a strong sense of arrival and serve the needs of visitors.

- 5.52 Resort visitors arriving by car, train, people mover, bus, coach, taxi, river ferry, bicycle or on foot will all be directed towards the entrance plazas from their respective points of arrival. From the main arrival hub adjacent to the multi-storey car parks, visitors will enter a main square 22,500 m² in area. From here they can proceed to the Conferention Centre and eSports Arena, or can pass through a covered street between two of the Resort's hotels towards the visitor entrance plazas outside the entrances to Gates One and Two. These will be up to 9,100 m² and 7,800 m² in area respectively. They will provide ticketing and ancillary commercial uses.
- 5.53 In the evening, a combination of theatres and indoor and outdoor venues in Gates One and Two and the RDE area will provide West End quality productions and shorter-format shows. These venues will showcase content from the intellectual property providers, as well as provide a stage for live comedy acts and concerts.
- 5.54 An area adjacent to the RDE area will include a Conferention Centre with a floor area of up to 11,000 m² and providing for up to 3,000 seated visitors, which will be used flexibly for concerts, live television productions, exhibitions and conventions. Additionally there will be a facility capable of hosting a range of eSports video computer gaming events, with a total floorspace of up to 16,500 m².

Landscape

- 5.55 A hard and soft landscape strategy, including amenity water features such as ponds and watercourses, will provide the setting for rides, attractions and amenities within the Leisure Core. It will also contribute to the theme and branding of each attraction. In general the masterplan seeks to work with the grain of the existing terrain but where necessary, earth shaping will be used to create the particular landscape required for the Leisure Core and to provide a flood resilient design.
- 5.56 Comprehensive landscape works and planting are proposed on the periphery of the Entertainment Resort. A perimeter service road and security fence around the leisure core will be integrated into the landscape treatment.

A2 Highway Works

- 5.57 The purpose of the proposed A2 Highways Works is to provide dedicated access to the Resort and separate local and Resort traffic close to the point where it leaves the A2(T), with all Resort traffic directed onto the Resort access road described under the Associated Development heading below. The design of this junction is under review. As envisaged currently, two existing roundabouts at the A2(T) / A2260 Ebbsfleet junction would be replaced by a signalised at-grade gyratory junction, from which the Resort access road would branch off towards the Resort. This proposed junction would likewise reintegrate departing visitor traffic with local traffic flows to ensure their smooth transfer on to the A2(T).

Associated Development

Hotel accommodation

5.58 Four hotels with a total capacity of up to 3,550 'keys' and a combined total land-take of c.3.6 ha will provide overnight accommodation for visitors. The hotels will be located in the area between Gates One and Two and possibly inside one of the Gates. Visitors will be offered a range family, up-market and luxury hotels to suit different tastes and budgets. Some of the hotels will be themed to provide a strong linkage with other Entertainment Resort attractions. One hotel will incorporate a covered water park attraction that might be available to all Resort guests. Up to 2,500 keys would be delivered with Gate One and up to 1,050 keys with Gate Two. They will be served by dedicated parking spaces as a part of the overall parking provision for the site.

Back of house areas

5.59 Back of house areas in the Kent Project Site will accommodate many of the necessary supporting technical and logistical operations to enable the Entertainment Resort to function. These include administrative office accommodation, staff car parking, engineering workshops and maintenance sheds, storage and food preparation facilities. A visitor centre and training building is proposed on the A226 London Road, immediately to the west of Pilgrims' Way. This will provide office space for the Resort's core management team and an exhibition space for visitors interested in the construction and development of the Resort. Once the Resort opens the role of the building will evolve to include staff training.

People mover and transport interchange

5.60 A 3.1 km people mover route is proposed between a proposed Resort travel interchange located to the west of Ebbsfleet International Station and the ferry terminal on the Ebbsfleet Peninsula, The route will incorporate stops at the southern end of the main resort car parking area and adjacent to the main visitor entrance plazas, with visitor orientation facilities at each. The route would be used exclusively by a dedicated fleet of articulated shuttle buses, each with a capacity of 100-150 passengers, as well as smaller vehicles for staff arriving by rail.

5.61 The Resort development will incorporate parking, maintenance and vehicle washing facilities for the shuttle buses. Provision will also be made in the Resort for local bus and taxi services and disabled access.

5.62 The proposed transport interchange beside Ebbsfleet International Station will be up to 2.4 ha in area and will include a 'pick up and drop off' area for the people mover system and bus stops for *Fastrack* - a Kent County Council rapid transit bus service. The transport interchange will include basic facilities for passengers including shelters, waiting rooms, ancillary retail and refreshment facilities, toilets and staff offices. Additionally there will

be a cycle hire facility to allow visitors to cycle to the Resort. Similar facilities will be provided on a smaller scale at the ferry terminal.

- 5.63 Where necessary, the existing Network Rail (High Speed) Limited facilities at Ebbsfleet International Station, including taxi and coach pick up / drop off areas and parking, will be relocated to a convenient location nearby.

Resort access road

- 5.64 A new Resort access road up to four lanes in width and approximately 2.3 km in length will provide the sole means of visitor access by private car between the A2(T) / A2260 junction and the Entertainment Resort. The access road would run parallel to the existing HS1 railway and would provide direct access to the proposed parking facilities. Access for visitors in private vehicles will not be available from the local road network. Existing roads would continue to provide access to Swanscombe and Northfleet, unimpeded by visitor traffic to the Proposed Development.

- 5.65 The Resort access road will include:

- a) the construction of up to four bridges and associated wing walls and retaining walls and up to eight tunnels through the existing chalk spines supporting the North Kent Railway line and London Road;
- b) the construction of a private means of access to land adjacent to the highway works;
- c) diversion and protection works to existing public utility apparatus, as required to accommodate the proposed works;
- d) drainage works, drainage attenuation ponds, earthworks, pavement works, kerbing and paved area works, signing and road marking works, street lighting works, safety barrier works, traffic signals, fencing works, landscaping works, noise mitigation barriers and other works associated with the construction of the permanent highway;
- e) the construction of an unadopted access road up to four lanes in width;
- f) highway works comprising the construction of a signalised at-grade gyratory road system to replace the existing two roundabouts at the A2(T) / A2260 junction;
- g) the provision of ecological mitigation works including mitigation measures to the River Ebbsfleet corridor.

Car parks

- 5.66 A maximum provision of 10,000 car parking spaces for visitors and hotel guests are proposed, in up to four multi-storey car parks with up to ten decks and floorplates of 9,000 m², along with up to 250 VIP parking spaces under the main visitor plaza and 500 staff

parking spaces in the Back-of-House area, giving a total of 10,750 car parking spaces. Also proposed are 150 coach parking spaces, 350 motor cycle parking spaces and 250 secure cycle spaces for visitors. Collectively these parking areas would occupy a gross land area of 12.6 ha. Parking for visitors and hotel guests will be split between the Kent and Essex Project Sites in a ratio of approximately 3:1, with c.7,500 spaces at the Resort and c.2,500 spaces at Tilbury.

5.67 Additionally a rest and welfare facility of up to 1,000 m² will be provided for coach drivers.

Local transport links

5.68 A network of pedestrian and cycle routes will be provided on the Swanscombe Peninsula and will connect to the adjacent residential areas of Greenhithe, Swanscombe and Northfleet. This will improve connectivity within existing neighbourhoods and create linkages with the network of green spaces.

5.69 Existing public transport services will be enhanced to encourage non-car modes of travel to the Proposed Development. This will include discussions with operators regarding improvements to bus routes and services (e.g. the extension of *Fastrack* to the Leisure Core) and additional rail capacity where required to meet visitor demands.

5.70 A staff travel plan will be implemented to promote car sharing and non-car based transport modes for staff. An event management plan will explain how the car parking spaces will be used throughout the year and in response to specific events at the Proposed Development. Both plans are likely to be secured pursuant to DCO Requirements.

5.71 The DCO will include provision for the alteration, diversion, stopping up and/or improvement of local roads, accesses and other rights of way where necessary, and for associated signage;

River transport infrastructure

5.72 Subject to further structural assessment, remedial works will be carried out to the existing White's Jetty and Bell's Wharf on the north-eastern side of the Swanscombe Peninsula to enable use for construction and service deliveries and the removal of waste. In addition, a new floating pontoon jetty is proposed between Bell's Wharf and Ingress Park for use by Thames Clippers passenger ferry services between the Resort and central London and passenger ferry services from Tilbury.

5.73 Dedicated facilities for passengers will also be provided at the ferry terminal at the Essex Project Site. These will include basic information, retail and catering amenities to serve passengers during their short waits between ferry services.

Service infrastructure

5.74 The Proposed Development will incorporate comprehensive provisions for service

infrastructure provision, with an emphasis on resilience and sustainability. The strategy will embrace electricity and heat supply, water supply and the sustainable management of waste and wastewater, and will potentially incorporate:

- a dedicated combined heat and power (CHP) plant with an electrical generation capacity of up to 30MW. The CHP plant will occupy a site up to 2,400 m² in area with a building footprint of up to 1,500 m². The CHP building will be up to 18 m high to ridge, with a stack up to 40 m in height;
- an electricity sub-station with a capacity of up to 60 MVA. The substation will occupy a site up to 2,500 m² in area with a building footprint of up to 1,600 m². In case connections need to be made to the electricity distribution network through existing substations, the substations at Springhead off Talbot Lane close to the A2(T), and at Pepper Hill to the west of the A262 Hall Road, are included in the draft DCO Order Limits.
- a dedicated waste management facility on a site up to 1 ha in area, containing a materials recovery facility (MRF), an anaerobic digestion plant and ancillary offices;
- a sewer connection to an off-site wastewater treatment works operated by Southern Water. For this reason the draft DCO Order Limits include Southern water's existing wastewater treatment works to the west of the A226 Thames Way, south-east of Ebbsfleet International Station;
- sustainable drainage systems across the Proposed Development to manage surface water flows and minimise the risk of pollution to the water environment. These systems might include systems to feed water to surrounding marshes in order to maintain hydrological regimes and sustain marshland wildlife habitats.

Flood defence works

5.75 The Kent Project Site will be defended from future flood events by building, improving and extending the existing earth berm around the Entertainment Resort. These works will accord with the Environment Agency's *Thames Estuary 2100* strategy for managing tidal flood risk in the Thames Estuary. This sets out how the Environment Agency and its partners can work together to manage tidal flood risk until the end of the century and beyond. The strategy aims to protect 1.3 million people and £275 billion worth of property and infrastructure from this increasing risk.

Habitat enhancement and public access

5.76 Retained habitats including Broadness and Black Duck Marsh in and beside the Kent Project Site are in variable condition and will be subject to landscape and habitat improvement works for wildlife including birds, reptiles, invertebrates and plants. Managed public access will be incorporated into these areas and it is proposed also to enhance a continuous pedestrian route along the edge of the peninsula so that visitors

and members of the public can enjoy walks along the edge of the river. This will help to connect the Proposed Development and local communities with the river environment and to provide an attractive entrance for visitors arriving by the River Thames. The path will form a section of the Grain to Woolwich section of the England Coast Path, which is being developed by Natural England in accordance with the Marine and Coastal Access Act 2009.

- 5.77 Aside from the inherent visual and biodiversity benefits, the areas of retained habitat will serve as quiet zones for visitors, affording opportunities to relax in natural surroundings and to appreciate the local ecology and views over the river. These zones will form part of a network of green spaces that will link with other parts of the Kent Project Site and the wider area. Areas of the marshes will be protected to provide undisturbed use by wildlife.
- 5.78 Where the loss of habitats cannot be adequately mitigated within the Project Site, a range of compensatory habitats will be created at off-site locations. These will comprise a range of wetland habitats that might include a mix of reed beds, standing open water and grazing marsh, along with dry habitats, including bare ground, grassland and scrub mosaic. The creation of these compensatory habitats will, as far as possible, connect to, and be in close association with, similar habitat types that are already established in the Thames estuary corridor. LRCH will seek to work with national and local agencies and stakeholders to achieve the best outcomes for nature conservation through the provision and long-term management of these compensatory habitats.
- 5.79 In keeping with the Ebbsfleet Development Corporation's vision the Proposed Development will be integrated with local public rights of way and green corridors. For example, Pilgrim's Way, a public footpath that runs across the Peninsula from London Road near Swanscombe Station, will be enhanced to provide a pedestrian route to the south bank of the Thames near the proposed ferry terminal.

Security and safety provisions

- 5.80 A security strategy will be implemented to promote a safe environment and minimise the potential for criminal or terrorist activity. The strategy will be developed in consultation with the emergency and security services and will include a mixture of built design measures including a secure fence set amongst vegetation, security technologies and security staffing measures. The Proposed Development will also include ancillary security, medical and fire response facilities to manage accidents and emergencies. A helipad will be provided for medical evacuation and occasional VIP use.

Related housing

- 5.81 In April 2017 new rules came into effect in England that allow up to 500 homes to be included in a DCO application. To qualify, the housing must either be functionally related to the construction or operation of the main development but not necessarily on the same site, or 'in geographical proximity' to the main project – on or close to the site where the main development will take place. The DCO application can include development

associated with the housing, such as local infrastructure.

5.82 LRCH has decided to take advantage of this provision by including 500 dwellings in its proposals for the Kent Project Site. As Figure 5.4 shows, a site has been identified in an abandoned chalk pit, known as Craylands Lane Pit, between the A226 London Road to the north and the railway to the south, immediately to the south of the Leisure Core. The housing would be for staff working in the Entertainment Resort, including young and seasonal employees. This is intended to allow for smooth operation of the Resort, assist recruitment, reduce the need to commute and reduce pressure on local housing rental markets.

Other provisions

5.83 The DCO will also include provision for:

- demolition of existing buildings and structures within the DCO Order Limit;
- removal or relocation of existing utility supplies and existing drainage / pipelines;
- drainage works;
- lighting;
- public art;
- hard and soft landscape works, incorporating earth shaping and planting;
- works to protect features of archaeological and paleontological interest;
- ancillary emergency response facilities (i.e. medical and fire points).

Schedule of Proposed Development

5.84 The table below provides a land area and floorspace summary for the main built elements.

Table 5.1: Preliminary estimates of the main component land areas and building footprints

Element	Use Class *	Maximum gross site area (hectares)	Maximum gross floorspace (square metres)
Land areas			
Kent Project Site		504.0	
Essex Project Site		29.9	
Total Project Site		533.9	
Gate 1		57.0	
Gate 2		25.0	
RDE and circulation areas		5.8	
Related housing		5.9	
Transport and transport **		12.6	
Buildings (outside Gates 1 and 2)			
RDE outside Gates 1 and 2	A1 Shops		324,000

	A3 Restaurants and cafes A4 Drinking Establishments A5 Hot food takeaways D2 Assembly and leisure C1 Hotels + Sui generis		
Back of House buildings	B1 Offices B8 Storage		31,400
Related housing	C3 Dwellinghouses		68,500
Bus and ferry interchanges	Sui generis		10,150
Multi-storey car parks	Sui generis		292,650
Total buildings (excl. Gates 1 and 2)			726,700

* as defined in the Town and Country Planning (Use Classes) Order 1987 (as amended)

** excluding roads

Construction activities

5.85 The construction of the Proposed Development will occur over two main phases and will include:

- security set up activities;
- ecological management including habitat protection and species relocation;
- project site clearance;
- ground treatment and CKD remediation activities;
- activities relating to management and control of licenced waste tips
- soil investigation work and treatment;
- archaeological investigations;
- construction of vehicle haulage routes;
- improvements to the existing Bell’s Wharf and White’s Jetty;
- construction of laydown, storage compounds and welfare areas;
- establishment of a materials stores and plants;
- on-site temporary facilities for construction workers (including parking, residential accommodation, staff rooms, changing rooms, toilets, medical facilities etc.);

- identification, relocation, and enhancement of utility infrastructure;
- diversion of some existing drainage features;
- Import of construction plant and materials;
- Export of construction waste;

5.86 The principal construction activities will include:

- bulk earthworks, excavation, filling and tunneling;
- temporary works to enable development;
- drainage works, pumping stations and pollution management systems;
- underground services and infrastructure services works;
- highways, cycleways, footways, hard landscaping;
- bridges, culverts, civil engineering structures;
- fencing, barriers, signage;
- foundation works and piling;
- substructure and superstructure works;
- roof structures and roof covering;
- cladding and envelope;
- internal and external walls
- mechanical and electrical services including plant, equipment and distribution;
- specialist services including PA, television, security systems, CCTV systems, data and communications systems;
- primary and secondary fit out;
- miscellaneous secondary and architectural metalwork;
- resort rides, equipment and facilities;

- off-site reinforcement of utilities and their connections;
- renewable energy systems;
- landscape works.

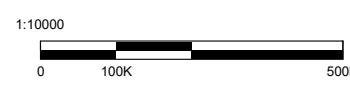
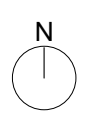
5.87 Detailed construction information will be provided in a Construction Method Statement (CMS) incorporating a Construction Environmental Management Plan (CEMP) and a Construction Transport Management Plan (CTMP), which would be submitted for approval and enforced by a DCO Requirement.

The Resort in operation

- 5.88 The London Resort is designed to cater for up to 6.5 million visitors per year with Gate 1 open only, and up to 12.5 million visitors per year with gates 1 and 2 in operation. It will be a destination with a global profile, with up to 12% of visitors projected to come from overseas.
- 5.89 Visitors will arrive at the London Resort by a range of transport modes including train, car, coach and ferry. The Resort layout will aim to lead them intuitively to their destination of choice, which might be the hotels, the RDE area outside the payline and Gates 1 and 2. LRCH is reviewing the means by which travel to the resort by non-car modes can be incentivised.
- 5.90 Visitors might come for one day or opt to stay in one of the Resort's hotels for a longer visit. With its transport terminals and the RDE area all outside the paylines for Gates 1 and 2, it is intended also that the RDE area will be attractive to afternoon or evening visitors from the local area and beyond. The proposals include connections to local pedestrian routes to encourage local visits, including the comprehensive enhancement of Pilgrims' way from Swanscombe.
- 5.91 Inside the Gates visitors will be offered rides, shows and attractions based around IP brands with a global profile. These will include film, television, computer gaming and toy franchises as well as attractions bespoke to the London Resort. From time to time, attractions will be updated or replaced to ensure that the Resort always has a fresh appeal to visitors, and flexibility will be sought in the DCO to this end.
- 5.92 Outside the Gates visitors will be attracted by events in the eSports and Conferention Centres, which will include business and exhibition events as well as concerts, shows and sports events.

Decommissioning

- 5.93 The Proposed Development has no specified end date and is a permanent attraction that will evolve over time. Where appropriate, planning permission will be sought from Dartford Borough Council, Gravesham Borough Council and / or Thurrock Council for any future changes.
- 5.94 Subject to DCO Requirements, where rides in the Leisure Core are to be replaced during the lifetime of the Proposed Development, a decommissioning statement will be submitted to the relevant planning authority for approval prior to implementation.



Apt

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Project	Project No.
The London Resort	19072

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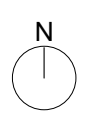
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THE LONDON RESORT DEVELOPMENT CONSENT ORDER
The Kent Project Site

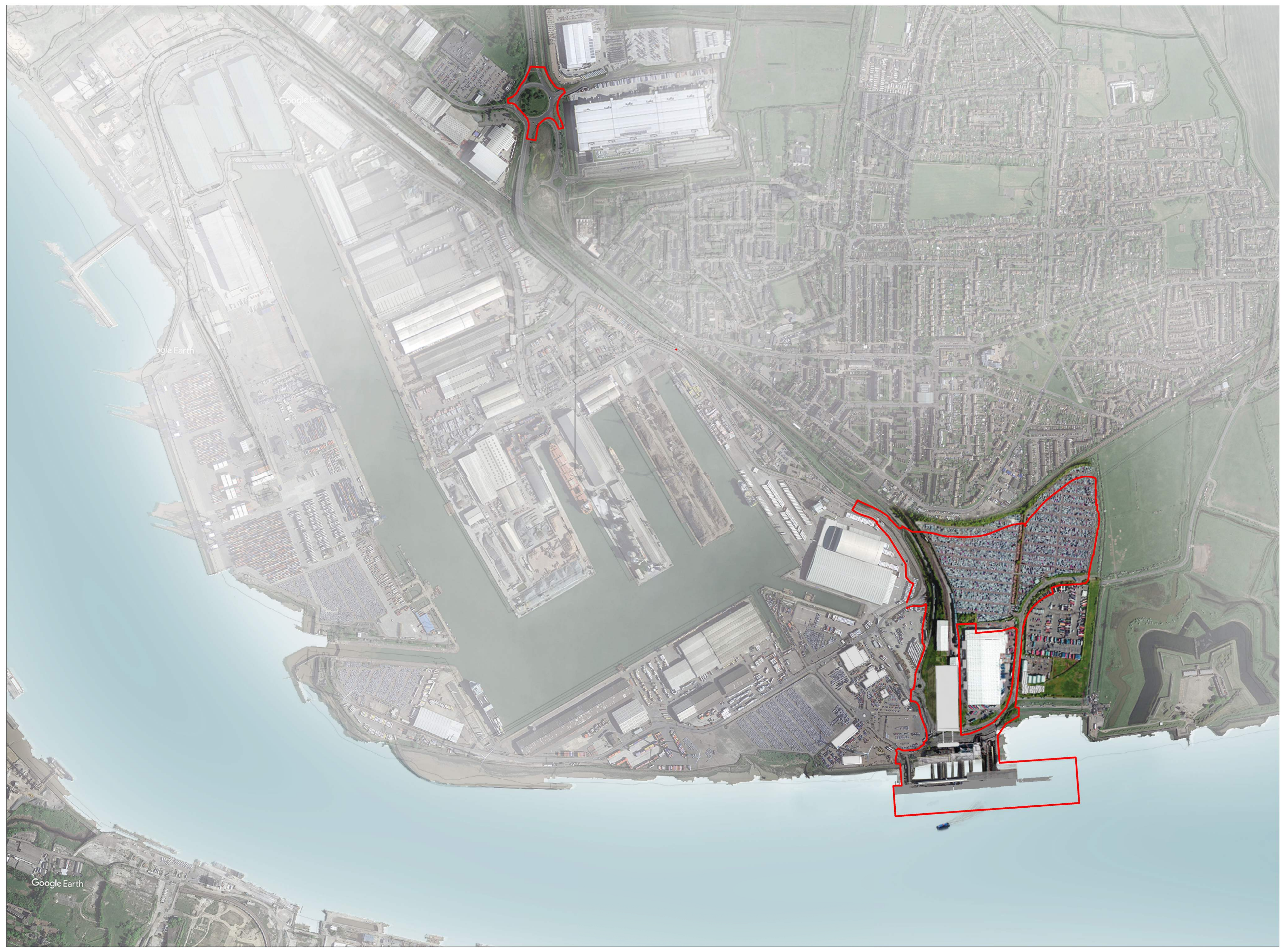
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Project: The London Resort Project No.: 19072

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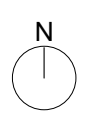
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THE LONDON RESORT DEVELOPMENT CONSENT ORDER
The Essex Project Site

Application Number
BC080001

Drawing Reference
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Project	The London Resort	Project No.	19072
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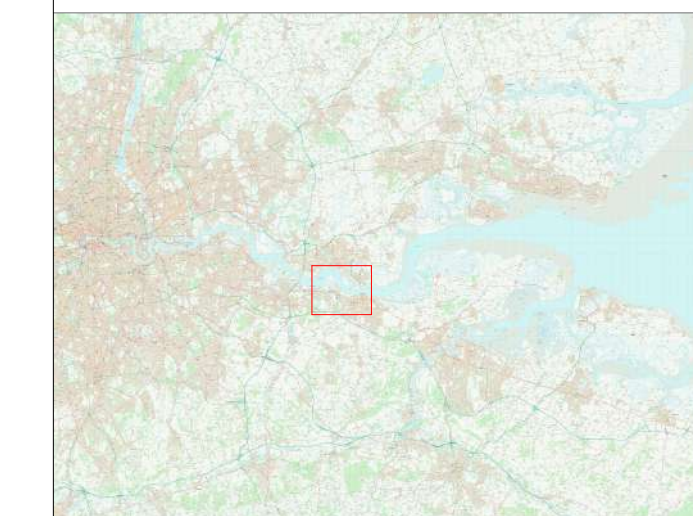
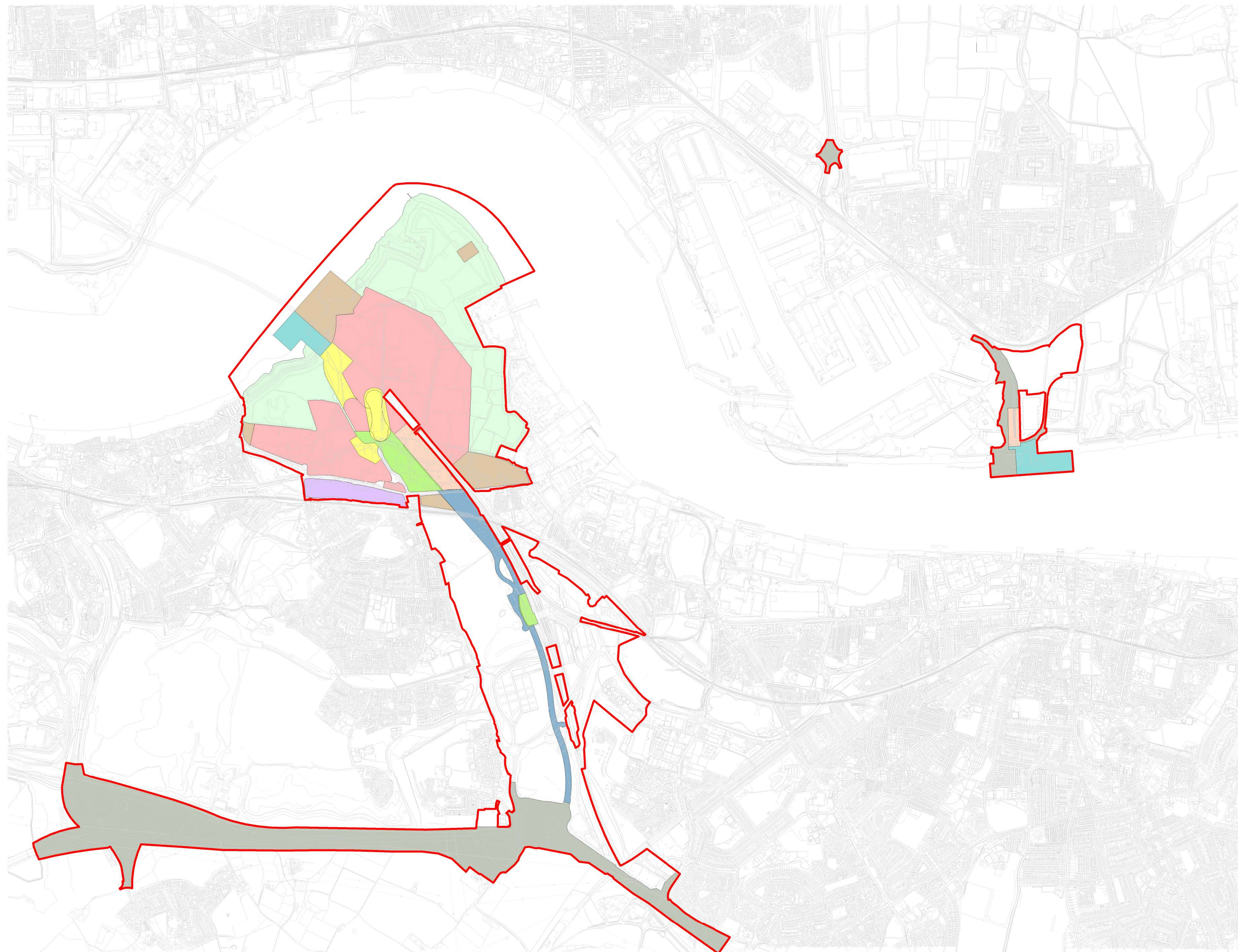
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THE LONDON RESORT DEVELOPMENT CONSENT ORDER
Illustrative Masterplan

Application Number
BC080001

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- Key**
- The Leisure Core
 - Landscape
 - Highway works and land affected by construction logistics
 - Hotel accommodation
 - Back of house areas and Service Infrastructure
 - People mover and transport interchange
 - Resort access road
 - Car parks
 - River transport infrastructure
 - Related housing
 - Order limit boundary

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Project The London Resort	Project No. 19072
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THE LONDON RESORT DEVELOPMENT CONSENT ORDER
Land Uses

Application Number
BC080001

Drawing Reference
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Chapter six ◆ The Environmental Statement

INTRODUCTION

- 6.1 The EIA for the London Resort project will be undertaken in accordance with the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (‘the EIA Regulations 2017’), the Planning Act 2008 and relevant guidance, including the Planning Inspectorate’s Advice Notes. The findings of the EIA will be reported in an Environmental Statement (ES) that will accompany LRCH’s DCO application.
- 6.2 This chapter provides an overview of the approach to the EIA, including the approach to the EIA assessment scenarios and general methodology used for consistency across the assessment topics.
- 6.3 In accordance with best practice, LRCH will ensure that the emerging findings of the EIA can be reported to the design team in a timely manner so that environmental harm can be addressed and effective mitigation measures ‘designed in’ as an integral part of the project design. Simultaneously, emerging designs will be communicated to the EIA team so that they might be assessed accurately. An iterative process of project refinement will thus be maintained throughout the design and assessment of the project, helping to ensure that likely significant adverse environmental effects can be avoided, reduced or mitigated where possible.
- 6.4 As explained in each of the topic-based EIA chapters that follow, the assessment will take into account consultation feedback and the Secretary of State’s 2014 EIA scoping opinion, subject to the further advice received in response to the current scoping request.

STRUCTURE AND CONTENTS

- 6.5 The London Resort ES will incorporate all of the information required by Regulation 14 and Schedule 4 of the EIA Regulations 2017. The ES will comprise four volumes as follows:
- Volume 1:** The main text of the ES.
- Volume 2:** Figures and tables referred to in ES Volume 1.
- Volume 3:** Appendices containing supporting and background information on individual EIA topics.
- Volume 4:** The Non-Technical Summary (NTS), providing a summary of Volume 1 of the ES.

6.6 Table 6.1 sets out the proposed structure of ES Volume 1 (the main text).

Table 6.1: The proposed structure of the London Resort Environmental Statement Volume 1 (main text)

Section	Description
Introduction	Providing: <ul style="list-style-type: none"> • A brief introduction to the Applicant; • An overview of the London Resort project; • A description of the consenting regime; • A description of the purpose and structure of the ES.
Project Description	Detailed description of the project and how the different aspects are interconnected / interrelated. Also provides an outline of the proposed construction methods and indicative programme, including operating hours, etc.
Site Description	To describe the site settings and surroundings of the Project Site.
Project Development and Alternatives	To include a description of the site selection process and alternative layout / design options considered by the Applicant.
EIA Assessment Methodology	Detailing the assessment methodology that the EIA has followed.
ES Main Impact Sections	This sub-section would report the findings of the EIA under the following topic headings: <ul style="list-style-type: none"> • Land use and socio-economic effects • Human health • Land transport • River transport • Landscape and visual effects • Terrestrial ecology and biodiversity • Aquatic ecology • Cultural heritage and archaeology • Noise and vibration • Air quality • Water resources and flood risk • Soils, hydrogeology and ground conditions • Waste and materials • Greenhouse gases and climate change • Cumulative, in-combination and transboundary effects <p>The ES chapters would follow a standard format under the following</p>

Section	Description
	<p>main headings and will identify the significant environmental effects at both the Kent Project Site and the Essex Project Site:</p> <ul style="list-style-type: none"> • Introduction • Methodology and data sources • Relevant law, policy and guidance • Baseline conditions • Assessment of likely significant effects • Avoidance and mitigation measures • Residual effects • Uncertainties • Conclusion

GENERAL APPROACH TO ASSESSMENT

EIA methodology

6.7 The ES will explain the process followed during the EIA including scoping, the collection of baseline environmental data, consultations, an assessment of likely significant environmental effects, the identification of mitigating measures, the assessment of residual effects. The ES will identify the methods used for the collection of data and the identification and assessment of likely significant environmental effects. Any assumptions made will be clearly identified.

6.8 The EIA will include a number of related activities as follows:

- establishing the existing baseline conditions;
- consultation with statutory and non-statutory consultees throughout the application process – including the preparation of a Preliminary Environmental Information Report;
- consideration of relevant local, regional and national planning policies, guidelines and legislation relevant to EIA and to the topic;
- consideration of technical standards for the development of significance criteria;
- review of secondary information, previous environmental studies and publicly available information and databases;

- physical surveys and monitoring;
- desk-top studies;
- computer modelling;
- professional judgement.

6.9 Impacts will be considered on the basis of their magnitude, duration and reversibility.

Significance criteria

- 6.10 The significance of environmental effects arising from the construction and operation of the London Resort will be assessed in the ES with the assistance of a series of matrices. The matrices will describe the sensitivity of receptors that have the potential to be affected by the Proposed Development and the magnitude of any effects that are likely to arise. The magnitude of effect and sensitivity of receptor will be cross referenced to give an overall significance of effect for any potential impact. Where it is not possible to quantify effects, qualitative assessments will be carried out, based on available knowledge and professional judgement.
- 6.11 The assessments will generally follow the structure and use the terminology outlined in tables 6.2–6.4 overleaf. In a limited number of cases, significance criteria might need to differ depending on the conditions encountered at the Project Site. The criteria would be subject to further discussion with statutory consultees. Each technical chapter of the ES will clearly identify and explain the specific criteria used.
- 6.12 Potential mitigation measures will include embedded mitigation through design / standard control measures, which would be used to produce an initial assessment of effects, and any further specific mitigation that would be taken into account to produce an assessment of residual effects.
- 6.13 Having regard to the character and location of the Proposed Development, and in accordance with Schedule 3 of the EIA Regulations 2017, the assessment will take into account:
- (a) the magnitude and spatial extent of the impact (for example geographical area and size of the population likely to be affected);
 - (b) the nature of the impact;
 - (c) the transboundary nature of the impact (see below);
 - (d) the intensity and complexity of the impact;
 - (e) the probability of the impact;
 - (f) the expected onset, duration, frequency and reversibility of the impact;
 - (g) the cumulation of the impact with the impact of other existing and/or approved development (see below);
 - (h) the possibility of effectively reducing the impact.

6.14 The assessment will include consideration of the interaction between environmental factors assessed, including population and human health; biodiversity; land, soil, water, air and climate; material assets, cultural heritage and landscape.

Table 6.2: Receptor sensitivity

Sensitivity	Example
Very High	Internationally designated site (e.g. Ramsar / SPA / World Heritage Site).
High	Nationally designated site (SSSI) / designated Landscape (e.g. NP) / principal aquifer / main watercourse / human health
Medium	Regionally designated ecology / heritage site / secondary aquifer / minor watercourse
Low (or lower)	Locally designated ecology / heritage site; area of hardstanding / brownfield land / industrial site / low ecological value.
Negligible	No sensitivity to change

Table 6.3: Magnitude of impact

Magnitude		Example
Major	Adverse	A permanent or long term adverse impact on the integrity and value of an environmental attribute or receptor
	Beneficial	Large scale or major improvement of resource quality; extensive restoration or enhancement; major improvement of attribute quality.
Moderate	Adverse	An adverse impact on the integrity and/or value of an environmental attribute or receptor, but recovery is possible in the medium term and no permanent impacts are predicted.
	Beneficial	Benefit to, or addition of, key characteristics, features, or elements or improvement of attribute quality.
Minor	Adverse	An adverse impact on the value of an environmental attribute or receptor, but recovery is expected in the short-term and there would be no impact on its integrity.
	Beneficial	Minor benefit to, or addition of key characteristics, features or elements; some beneficial impact on attribute or a reduction in the risk of a negative impact occurring.
Negligible	Adverse	Very minor loss
	Beneficial	Very minor benefit
No change		No change would be perceptible either positive or negative

Table 6.4: Significance of effect

		Magnitude of impact				
		No change	Negligible	Minor	Moderate	Major
Receptor Sensitivity	Very high	Neutral	Slight	Moderate	Large	Very large
	High	Neutral	Slight	Moderate	Large	Large
	Medium	Neutral	Slight	Slight	Moderate	Large
	Low	Neutral	Slight	Slight	Slight	Moderate
	Negligible	Neutral	Neutral	Neutral	Neutral	Neutral

6.15 Where relevant, ‘study areas’ would apply to the assessment of effects under specific topic areas. The study areas would vary in size depending on the assessment to be undertaken. The proposed study areas are identified and justified in the topic-specific chapters of this scoping report.

IN-COMBINATION AND CUMULATIVE EFFECTS

6.16 Schedule 4(5)(e) of the EIA Regulations require the EIA to take into account the ‘*cumulation of the development with other existing and / or approved projects taking into account any existing environmental problem relating to areas of particular environmental importance likely to be affected or the use of natural resources*’. Schedule 4(5) of the Regulations also requires that:

The description of the likely significant effects on the factors specified in regulation 5(2) should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development.

6.17 The EIA will consider the cumulative effects of the construction and operational phases of the Proposed Development. Other developments to be considered in this part of the analysis are identified in the topic-based chapters of this EIA Scoping Report and include housing and commercial developments in Ebbsfleet Garden City, the Tilbury2 port expansion currently under construction and Highways England’s proposals for the A2(T) Bean – Ebbsfleet road improvements and the Lower Thames Crossing.

6.18 LRCH will liaise with the relevant planning authorities to identify any other developments in the area of the Project Site that should be considered.

6.19 In addition, the EIA will consider the in-combination effects where receptors experience multiple potentially non-significant effects from a range of impacts, which might collectively become significant. These will be considered through the use of a matrix based approach and set out within a stand-alone chapter within the ES¹.

¹ This approach is consistent with Planning Inspectorate Advice Notes 9: *Rochdale Envelope* and 17: *Cumulative Effects Assessment*

CONSULTATION

- 6.20 Regulation 10(6) of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 states that before adopting a scoping opinion the Secretary of State must consult the consultation bodies and take into account the responses received. The Planning Inspectorate Advice Note Seven: *Environmental Impact Assessment: Process, Preliminary Environmental Information and Environmental Statements* explains the benefit of applicants undertaking their own information consultation prior to the submission of a scoping opinion and states, ‘prior to submitting a scoping request, Applicants may wish to undertake their own non-statutory consultation with the consultation bodies, or others. This might allow for a refinement of options prior to making a formal request’.
- 6.21 LRCH has engaged with interested statutory consultees including the Environment Agency, Natural England, Historic England, the Marine Management Organisation, Highways England, the Port of London Authority (PLA), Ebbsfleet Development Corporation and the relevant highways and planning authorities. Feedback is reflected in the topic specific chapters of this report. Further consultation will be undertaken with the prescribed consultees, other statutory consultees and interested parties during the preparation of the Preliminary Environmental Information Report (PEIR) and the ES for the project.

TRANSBOUNDARY EFFECTS

- 6.22 Certain types of major development might exert environmental effects that extend beyond the boundary of the nation-state in which the development would be located. Planning Inspectorate Advice Note 12: *Transboundary Impacts and Process* (version 5, March 2018) offers guidance on the procedures for transboundary consultation associated with a DCO application.

- 6.23 PINS Advice Note 12 (page 2) explains that:

‘The UK is a signatory to the United Nations Economic Commission for Europe (UNECE) Convention on Environmental Impact Assessment in a Transboundary Context. The Convention was adopted in 1991 in the Finnish city of Espoo and is therefore known as the ‘Espoo Convention’. The UK is also a signatory to the Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters (the ‘Aarhus Convention’) and its Protocol which provide people with the rights to easily access information, participate effectively in decision-making in environmental matters and to seek justice if their rights are violated.

The European Union (EU) Directive 85/337/EEC (as amended) (the EIA Directive) implements the Espoo and Aarhus Conventions in the EU and is transposed into UK law through the EIA Regulations.’

6.24 PINS Advice Note 12 (page 7) explains the role of developers and offers the following advice:

'...the Applicant is requested to provide information to the Inspectorate to enable a view to be reached as to whether the development is likely to have significant transboundary effects on other EEA States. Information about the potential for transboundary effects should be provided by the Applicant as part of:

- *The scoping request, if a scoping opinion is requested by the Applicant from the Inspectorate under Regulation 8 of the EIA Regulations, and*
- *The suite of documents accompanying the application for development consent...'*

6.25 A transboundary screening matrix for the London Resort project is provided in Appendix 6.1 of the scoping report. The following potential significant transboundary effects have been identified and a high-level assessment undertaken:

- *Traffic and transport* - significant traffic and transport effects could occur where visitor trips between EEA States and the UK give rise to transportation capacity problems (particularly in sensitive areas) which cannot be mitigated. The transboundary screening matrix has concluded that, in the context of the daily people trips between the UK and EEA States, it is likely that the increase in trips that could be attributed to the London Resort would be negligible and that many of the overseas people visiting the London Resort would already be staying in the region anyway. It is therefore likely that the existing transport network would be able to accommodate the increase within the work associated with the Proposed Development.
- *Air quality* - significant air quality effects could occur where increases in trips between EEA States and the UK give rise to traffic-related emissions which have an adverse effect on residential properties in terms of local air quality, or ecologically sensitive designated sites and cannot be mitigated. The transboundary screening matrix concludes that, as the increase in trips between the UK and EEA states attributed to the London Resort is considered negligible, it is likely that emissions of traffic related pollutants in EEA States that are directly attributable to the London Resort will be insignificant in terms of effects on the local air quality of residential properties near major transport routes and environmentally sensitive designations
- *Socio-economic* - significant economic effects could occur where the Proposed Development has either a positive or negative effect on the economy of an EEA State. Negative effects could occur through the redistribution of visitors from EEA State visitor attractions to the UK and / or where business opportunities are created in the EEA States (directly or indirectly) as a direct result of the Proposed Development. The transboundary screening matrix identifies that the London Resort may result in a reduced number of people visiting entertainment resorts in EEA States which may result in reduced gross domestic product in certain states. However, in the context of the overall tourism numbers for the EEA States identified, any potential reduction is likely to be negligible and the effects on economies insignificant. It is considered that

the overall level of GDP within EEA States would increase as a result of the operation of the London Resort, with more visitors attracted from outside Europe.

- 6.26 As set out above, it is not considered that the Proposed Development would give rise to significant transboundary effects on EEA States. However, as the EIA process progresses, the Applicant will seek to define potential transboundary effects with clarity and will involve affected parties in consultations in a timely manner if required.

Seven ◆ Land use and socio-economic effects

INTRODUCTION

- 7.1 This section explains the approach to considering the potential range of land use and socio-economic effects that are likely to be generated by the construction and operation of the Proposed Development.
- 7.2 The assessment identifies temporary and permanent, beneficial and adverse, direct, indirect and induced effects on residents, community facilities and social infrastructure, public services and public open space, business, employment, skills, the labour market, and the wider economy as a result of the construction and operation of the Proposed Development.
- 7.3 Where significant effects arise, the assessment will present appropriate mitigation to minimise any significant adverse effects. It will also include measures to secure and enhance positive effects of the Proposed Development.

RELEVANT LAW, POLICY AND BEST PRACTICE EVIDENCE

Relevant Legislation

- 7.4 The assessment will be undertaken in accordance with the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (EIA Regulations).

Policy

- 7.5 This section identifies the relevant socio-economic national, regional and local policies that have informed the scope of the assessment presented in this chapter. Further information on the policies associated with this chapter is contained in chapter three of this Scoping Report.
- 7.6 National Policy Statements (NPS) set out the need for and government's policies to deliver Nationally Significant Infrastructure Projects (NSIPs) in England. Chapter three of this scoping report explains that there is no NPS for business and commercial NSIP projects. However, to the extent that the Project includes transport and highways infrastructure, regard will be had to relevant policy in the NPS for National Networks and the Ports NPS.
- 7.7 Table 7.1 identifies other relevant policy.

Table 7.1: Key policies and their relevance to socio-economics

Policy	Relevance to socio-economics
National Planning Policy Framework (NPPF) (2019) ¹	<p>The National Planning Policy Framework sets out the Government’s planning policies for England and how these should be applied. The document outlines how the following economic objective is one of three overarching objectives of the planning system towards achieving sustainable development:</p> <p><i>to help build a strong, responsive and competitive economy, by ensuring that sufficient land of the right types is available in the right places and at the right time to support growth, innovation and improved productivity; and by identifying and coordinating the provision of infrastructure</i></p>
Regional and sub-regional planning policy: <ul style="list-style-type: none"> • South East Local Enterprise Partnership • Kent and Medway Economic Partnership • The Thames Gateway Kent Partnership 	<p>There are three regional/sub-regional bodies that cover the area of the Project Site. Each of these bodies have policies and documents – such as Strategic Economic Plans – which outline ambitions for sustainable economic growth in the area.</p>
Relevant local policy from: <ul style="list-style-type: none"> • Dartford Borough Council • Gravesham Borough Council • Thurrock Council • Ebbsfleet Development Corporation 	<p>The LPAs have local plans, economic strategies, development policies and corporate strategies, all of which contain policies of relevance to socio-economics.</p>

Best practice

Table 7.2: Best practice documentation

Document	Description
Additionality Guide, Fourth Edition. ²	<p>Guidelines produced by the Homes and Communities Agency to assess the additional impact of a proposed development after accounting for displacement, multiplier and leakage impacts. Additionality is defined as ‘the extent to which activity takes place at all, on a</p>

¹ Ministry of Housing, Communities and Local Government (February 2019), National Planning Policy Framework

² Homes and Communities Agency (2014), Additionality Guide. Fourth edition

Document	Description
	larger scale, earlier or within a specific designated area or target group as a result of the intervention.'
Employment Densities Guide, Third Edition. ³	Report published by the Homes and Communities Agency was written to assist in estimating the employment generated by property development across different floorspace types based on 'employment density' ratios, which are generally expressed as the number of square metres per full time equivalent (FTE) employee. This document also provides benchmarks for job creation from hotels of different categories, using a metric of FTEs per hotel room.
London Employment Sites Database. ⁴	The London Employment Sites Database records recently completed employment developments and those in pipeline in London. It contains useful information on key assumptions and other employment densities, such as for D1 space.
Economic Impact of Tourism, Kent. ⁵	This report examines the volume and value of tourism and the impact of visitor expenditure in the local economy in 2017. It provides results from surveys and local data which will inform the socio-economic assessment.
Planning Inspectorate Advice Note 12. ⁶	An advice note setting out the procedures for assessing transboundary effects associated with NSIP applications.

THE 2014 SCOPING OPINION

7.8 The 2014 Scoping Opinion provided by the Secretary of State provided guidance on the proposed assessment approach for socio-economics. Their summary of these issues is presented below. Comments were also provided by KCC, GBC and DBC regarding the scope and methodology of the assessment, which have been reviewed and considered in the drafting of the current Scoping Report.

- *'The Scoping Report states that the proposed development could generate in the region of 27,000 direct and indirect jobs. The method used to calculate this is not described, however the Secretary of State welcomes the proposals to provide more detailed information in this regard in the ES (for both construction and operation).'*

³ Homes and Communities (2015), Employment Densities Guide. Third edition

⁴ CAG consultants (2017), London Employment Sites Database. Final report

⁵ Destination Research (2017), Economic impact of tourism, Kent – 2017 results.

⁶ The Planning Inspectorate (March 2018), Advice note twelve: transboundary impacts and process

- *The characteristics of jobs generated by the project should be clearly described. This should include information on whether jobs are permanent/part-time, the range of skills required, the seasonality of employment, the catchment area for employment and how proposed employment compares with the available workforce in the area.*
- *The assessment should also consider the potential impacts of any existing land uses/jobs that would be lost or displaced by the proposed development. This should not be limited to employment uses but also include community uses such as open spaces, public rights of way and other recreational or community facilities.*
- *The proposed development includes significant retail and other uses (e.g. event/exhibition space and hotel accommodation) which could impact upon similar existing provision within the wider local area, including Bluewater Retail Park. The ES should describe how the proposals compare with existing provision and consider the potential for adverse effects. Potential indirect effects on local housing supply should also be assessed, as highlighted by GBC (Appendix 2).*
- *The method used to calculate the likely number/growth of visitors to the resort should be described. The potential for the development to affect visitor numbers at other similar attractions in England and abroad should be assessed.*
- *Paragraph 13.38 of the Scoping Report notes that the assessment will need to draw judgements on the net effects of visitor expenditure (both on and off site). Any such judgements should be clearly explained and justified. In this regard the Secretary of State welcomes the proposed use of scenarios (based wherever possible on research from other similar resorts) to determine likely best and worst case impacts. These scenarios should be clearly explained and defined in the ES.*
- *The Secretary of State notes and welcomes the consideration given to the potential for socio-economic transboundary effects from the proposed development. Table 13.7 indicates the potential for transboundary effects and Paragraph 13.57 states that consideration will be given to the relative materiality and characteristics of such effects. The applicant is encouraged to consult early with potentially affected EEA States to ensure the ES includes sufficient information to determine the potential for significant effects.*
- *Further advice on the recommended approach to dealing with potential transboundary effects is provided in Section 4 of this Opinion and in Planning Inspectorate Advice Note 12.'*

CONSULTATION FEEDBACK

- 7.9 In 2014/15, London Resort carried out several stages of public consultation. This included a series of targeted workshop events related to socio-economic effects including

environmental impacts, transport, job opportunities, employment and skills; tourism, business and regeneration impacts; construction and supply chain. After these events, Volterra engaged with various groups and individuals which had been identified. These included representatives from local charities, work programmes, educational institutions. Specific meetings were also held with The Learning Shop at Bluewater, for example, to understand its work programmes and initiatives.

7.10 Engagement with local authorities and the EDC also took place on key socio-economic considerations including temporary workforce accommodation during construction, visitor numbers, employment and skills, supply chain, retail and leisure impacts.

7.11 General feedback was positive about the proposals and their potential socio-economic impacts. However, it was noted by many consultees that information was not yet sufficiently advanced for views to be reached on the likely scale or distribution of impacts. Feedback concerned:

- the need to ensure that as much detail as possible was included within the application so that the impacts could be understood as fully as possible;
- the importance of considering different scenarios (best/worst case) where uncertainties existed;
- the importance of consultation on key issues so that local concerns, objectives and recommendations could be taken into consideration;
- concerns were raised that the local construction workforce might not have the capacity to serve most of the construction demands of the proposals, especially once cumulative schemes are considered;
- As the area is undergoing so much change, the importance of considering cumulative impacts along with other known developments and plans for the area was highlighted.

BASELINE CONDITIONS AND MAIN ISSUES

7.12 The baseline conditions will be established with reference to a policy and desktop review.

7.13 The policy review will outline the relevant local, regional and national, social and economic policies for the area. The relevant policy documents are referred to in table 7.1.

7.14 The desktop review will be undertaken at several geographic levels, including the Immediate Impact Area (the immediate area around the site), the local area (Dartford, Gravesham and Thurrock), the sub-regional area (Kent, Medway, Thurrock and Essex⁷ – to be defined by the combination of local authorities which make up these counties), the

⁷ Defined as county / unitary authorities to be consistent with ONS statistical data releases.

region (the South East and East of England) and the national area (England, GB, UK, depending on data source availability). This review will consider available information relating to the site from current owners, published and safeguarded information from database records such as the Office for National Statistics, Valuation Office Agency, Department for Communities and Local Government, local authority data, Edubase, the NHS, Visit England, Visit Essex and Visit Kent. Information will be processed using geographic information systems (GIS) methodology.

7.15 The baseline analysis will summarise the socio-economic context of the site under the following broad categories:

- **Demographics:** population, age profile, household composition, deprivation and crime, residential qualifications, housing supply, housing tenures, house prices, housing need, deprivation and crime, accommodation stock;
- **Economy and labour market:** employment, sectoral employment, unemployment and claimant count, labour skill levels, economic activity, earnings, commuting patterns, provision of commercial space (including retail and leisure), tourist attractions and cultural assets; and
- **Social infrastructure:** education provision, healthcare provision, open space and public routes, community assets.

PRELIMINARY ASSESSMENT OF POTENTIAL EFFECTS

7.16 The table overleaf summarises the likely potential effects as a result of the London Resort.

Table 7.2: Potential socio-economic effects of the London Resort project

Activity	Effect	Receptor
CONSTRUCTION EFFECTS		
Temporary construction employment and supply chain	Potential temporary effect of employment generation and effects on businesses in the supply chain	Local and wider residents and businesses
	Potential temporary effect of employment on the labour market, skills and training	Local residents
	Potential temporary effect of the construction workforce on crime levels	Local residents
	Potential temporary effect of the construction workforce on local healthcare	Local residents

Activity	Effect	Receptor
	Potential temporary effect of employment generation on the housing market (including private rented and short-term accommodation)	Local housing market and residents
Displacement to land and property as a result of the land take	Potential temporary or permanent displacement/loss of businesses and other services	Local businesses
	Potential temporary or permanent displacement/loss of community uses, such as open spaces, public rights of way and other recreational or community facilities	Local residents
OPERATIONAL EFFECTS		
Employment generation	Potential effects associated with net additional employment (including indirect and induced effects, and characteristics of jobs generated by the project)	Local and wider residents and businesses
	Potential effects of new employment on skills and training	Local residents
	Potential effect of employment generation on the housing market	Local housing market and residents
Visitor generation	Potential effects of visitors on local accommodation options	Local businesses
	Potential effect of trade diversion from other tourist attractions	Local and wider businesses
Visitors and workers	Potential effects of visitor and worker expenditure	Local businesses
	Potential effect of workers and visitors on healthcare provision	Local residents
	Potential effect of workers and visitors on other public services	Local residents
	Potential effect on local retail and leisure, including town centres	Local businesses

APPROACH AND METHODOLOGY

7.17 The following outlines the proposed approach to assessing the likely significant effects shown above. The assessment will draw on existing analysis and methods established for other similar large projects, as well as policy, standards and guidance. Some bespoke methods will need to be used, given the unique nature of the proposals. Wherever such

bespoke approaches are used, they will be fully documented.

Study areas

- 7.18 As outlined earlier in this report, the Project Site includes land on both sides of the river in both Dartford and Gravesham boroughs, in north Kent, and Thurrock, in Essex.
- 7.19 Where possible and relevant the baseline information is assessed within the geographical study areas outlined in table 7.2. These are chosen to reflect the different socio-economic impact zones of the Proposed Development. Due to the Proposed Development's designation as a NSIP, the areas affected will be over a large geography, ranging from the immediate area including the displacement of existing occupiers and the comprehensive regeneration of the Project Site; the impacts on the Local Area (the local authorities of Dartford and Gravesham, and Thurrock) through to the national level. The areas are also included in relation to some of the data presented for comparative purposes.

Table 7.3: Geographical study area definitions

Geographical study area	Definition
Immediate Impact Area	Lower and Middle Super Output areas (LSOA and MSOA) covering the site and immediate vicinity
Local Area	Dartford, Gravesham and Thurrock (local authorities)
Sub-Regional Area ⁸	Kent and Medway, Essex, Thurrock (combination of districts)
Regional Area	South East and East
National Area	England, GB, UK (depending on data source availability)

Baseline

- 7.20 As with any dataset, the socio-economic baseline will change over time. The ES chapter will firstly define the existing baseline socio-economic conditions of the environment surrounding the Project Site. This will be undertaken using the most recent published sources: data sources published in 2019 or 2020 will be used where possible, but where this is not available the next best alternative (i.e. the most up to date) will be used as a proxy. The assessment will present baseline data over a reasonable period of time where possible so that the impact of any short-term shocks or changes can be identified in the baseline. This may be relevant to the impact of COVID-19 on health, social and demographic baseline data. This will be discussed in the assessment and any conclusions drawn from the analysis will be based on longer term trends. This will be clearly described in the ES.
- 7.21 Publicly available data and information will also be considered to inform a future baseline. The future baseline assessment will quantify how the socio-economic conditions are likely to change from current levels during the period that the Proposed Development is under construction. This will be informed by data from the ONS and sub-regional statistical

⁸ Defined as county / unitary authorities to be consistent with ONS statistical data releases.

forecasts and/or the local evidence base. For example, the baseline will review labour market projections to understand how the local labour market is expected to change before the scheme opens.

- 7.22 Where information on how the existing baseline conditions are likely to change between now and the opening year of the Proposed Development are unavailable (for example, information on crime and deprivation), or the future baseline is not expected to change materially from the existing baseline (for example, open space and play space), it will be assumed that the future baseline is unchanged from the existing baseline.
- 7.23 The Planning Inspectorate’s guidance on cumulative effects notes that projects that are under construction which are expected to be completed before the construction of a given development proposal should be considered as part of a future baseline for assessment purposes if the effects of those projects are fully determined.⁹ However, since this approach takes into account changes in the baseline over time, the impact of these projects will implicitly be accounted for in the future baseline. The assessment will therefore not assess the impact of these schemes to avoid double counting their impact on the future baseline. This approach has been taken on other NSIPs and avoids the need to unpick specific schemes and their timescales, instead relying on local authority forecasts and models, which themselves have been developed by taking into consideration the future pipeline of schemes likely to be delivered.

Potential sensitive receptors

- 7.24 The sensitivity of receptors is dependent upon the future baseline conditions. It is not possible to ascribe specific ‘values’ or a quantifiable scale of ‘sensitivity’ to all socio-economic receptors due to their diversity in nature and scale.
- 7.25 The socio-economic assessment will therefore focus on the qualitative ‘sensitivity’ of each receptor, and on their ability to respond to change based on recent rates of change and turnover. For example, very high house prices and persistent under-delivery of housing or low skills would be deemed very sensitive receptors because they represent very significant and persistent socio-economic problems in the context of the local environment. Whilst the sensitivity of each receptor may be defined qualitatively, wherever possible this will be based upon quantitative evidence and the effects will be assessed quantitatively wherever possible (see next section for more detail).

Assessment of potential effects

- 7.26 Where relevant, the socio-economics effects identified will be quantitatively and qualitatively appraised against relevant national standards, trends and policy requirements. The likely significant socio-economic effects will be assessed against the relevant baseline position.

⁹ The Planning Inspectorate (2019): Advice Note Seventeen: Cumulative Effects Assessment

- 7.27 In accordance with the HCA Additionality Guide,¹⁰ the likely effects of the Proposed Development will be considered at various geographic scales, which will be clearly described in the chapter.
- 7.28 There will be a phased approach to development; Gate One will be first to be delivered, followed by Gate Two. The assessment will consider several core assessment years to account for the lengthy nature of the construction period and the phased approach to opening, these include 2025 (1st full year after Gate 1 opens), 2030 (1st full year after Gate 2 opens) and 2039 (maturity). The core assessment year might vary dependent on the nature of the effect. The reasons for this could include the year being the peak and therefore worst case for some effects (other effects like visitor / tourism impacts will be assessed on non-peak scenarios), or because it is a specific point in time when something relevant occurs that is important to consider within the assessment.

Construction effects

- 7.29 The assessment will consider the temporary employment opportunities and the impact on the labour market. It will also consider the implications of this employment on the local housing market resulting from extra demand placed by non-home-based workers, including local guesthouse and hotel bed supply and short term accommodation.
- 7.30 The assessment will also consider the potential impacts of any existing land uses/jobs that will be lost or displaced by the Proposed Development. This is important to assess the additional employment impact of the Proposed Development, but the land take impacts are not just limited to employment and would also consider the lost / displaced 'bad neighbour uses' as well as community uses, such as open spaces, public rights of way and other recreational or community facilities.

Operational effects

- 7.31 Modelling and accepted metrics, such as employment densities, average worker expenditure and indirect multipliers, will be used in order to calculate primary, secondary and indirect effects. Key guidance used here will be the HCA Employment Density Guide for estimating direct employment impacts,¹¹ and the HCA Additionality Guide,¹² which will be used to estimate indirect and induced impacts. However, the scheme is unique in its nature and therefore the employment densities and additionality guides do not have appropriate industry standard metrics for assessing the likely direct, indirect and induced employment effects of the proposals. In assessing the effects, this assessment will therefore draw upon industry knowledge from the Applicant and appropriate benchmarks and comparators. Where assumptions are required for which comparator empirical evidence is not available, the assumptions and the basis for them will be transparently

¹⁰ Homes and Communities Agency (2014): Additionality Guide, Fourth Edition

¹¹ Homes and Communities Agency (2015): Employment Density Guide, 3rd Edition

¹² Homes and Communities Agency (2014): Additionality Guide, Fourth Edition

described and the results will be subject to sensitivity tests.

- 7.32 Where the approach departs from industry standard, detailed explanation and justification for the methodology will be provided. For example, the assessment proposes to use an incremental approach to estimate employment effects. Employment will be estimated through several different approaches: a bottom-up approach based on visitor numbers, the plans for the Proposed Development and the employment densities guide, and planning information from the Applicant; and a top down approach based on industry benchmarks. The employment densities guide notes the following, which provides support for this approach:

'The diversity of the cultural attraction sector indicates that providing a single density is impossible, and even the range provided requires significant levels of specific understanding to ensure employment estimations are accurate.'

- 7.33 The assessment will also identify the characteristics of jobs generated by the Proposed Development. This will include information on whether jobs are permanent/part-time/seasonal, the range of skills required, the catchment area for employment and how proposed employment compares with the available workforce in the area. This last point will be important to understand the extent to which a skills gap exists, and local residents stand to benefit from the new employment provided. Furthermore, through understanding any such skills gap, and working collaboratively with local employment institutions, identifying appropriate employment and skills interventions and initiatives that could be put in place with the intention of maximising the potential take up and matching between local people and the new job opportunities.
- 7.34 Data on commuting patterns from the 2011 Census will be used to provide an initial estimate of the proportion of jobs created by the Proposed Development that will go to local residents. Whilst the existing commuting patterns to the current site are useful, the Proposed Development will be completely different in terms of the number of people it employs. The pattern of trips around the Project Site will be adjusted based on comparable sites to account for the characteristics of major leisure attractions. The analysis will also adjust the proportion of trips from Thurrock on the basis that a ferry will be provided at Tilbury which is expected to be an important access point for workers and visitors to the Proposed Development. This effect will be informed by the Employment and Skills Strategy.
- 7.35 There will be indirect effects on housing supply in the local area. The assessment will consider the total additional housing demand from the new workers and the type of housing required. The potential impacts on housing are difficult to predict and so the assessment will present several scenarios. The Proposed Development also includes related housing of up to 500 dwellings for Resort workers, reducing the need for off-site provision.
- 7.36 The approach to estimating visitor numbers will be clearly explained and justified. The estimates will be sense-checked against other similar attractions across the world. Visitor

and worker expenditure will be estimated using secondary research from similar attractions. It will also consider local primary research – by bodies such as Visit England, Visit South East, Visit Kent and Visit Essex – concerning domestic and foreign visitor behaviour to understand the net effects of visitor expenditure and resulting induced effects.

- 7.37 The impact of visitors on off-site accommodation will be estimated based on the number of overnight stays by visitor type. Different types of visitor (primary resident, secondary resident, domestic tourist, and international tourist) will have different trip purposes and different preferences on where they wish to stay. For example, some may be linking a trip with London, of whom some may wish to stay within London rather than closer to the Project Site. Given the wealth of attractions in the South East, others will be linking their trip to regional destinations in Kent or Essex and staying outside London. The analysis will then make assumptions (based on evidence from other attractions, world-wide) about the typical trip purposes of the different types of visitor to estimate the distribution of hotel demand. Based on trip purpose, a further set of assumptions are used to distribute the overnight stays by area. This will provide information on the number and distribution of off-site accommodation required to accommodate visitors to the Proposed Development which can be compared to existing supply to understand the likely impact. Several scenarios of likely demand will be presented to reflect the uncertainty in the forecast of likely demand. The scenarios will also consider the potential for other indirect impacts on the local rental market. For example the London Resort could result in additional demand for Airbnb-type platforms. This could remove stock from the local market, which could have implications for rental prices.
- 7.38 The assessment will review evidence from similar attractions to understand the likely impact of the Proposed Development on other tourist attractions. This will consider catchments, demographics, penetration rates and other competition factors in order to consider the extent of any such impacts.
- 7.39 Visitors and workers will spend money locally and place pressure on local healthcare and other public services. The assessment will consider the joint impact of the residents and workers for several effects to understand the overall impact. Methods will be based on transparent and clear assumptions, and industry standard approaches wherever possible. For example, rates of accidents and resulting attendance at A&E would be derived from industry data on accident rates by sector. Expenditure rates and patterns will be derived from tourism studies by Visit England, Visit South East, Visit Kent and Visit Essex.
- 7.40 A retail and leisure impact assessment will be produced to assess the likely impact of the Proposed Development on local businesses, town centres, leisure facilities and tourist attractions. This assessment will summarise the key conclusions of that assessment and will consider both the positive impacts due to additional spending in the local area as well as the potential for trade diversion.
- 7.41 The assessment will consider scenarios assessing the range of likely significant effects of the Proposed Development where relevant. Scenario testing may be relevant for

considering the potential net visitor expenditure (on and off site), the impact on the local housing market (during construction and operation) or the employment effects. These scenarios will aim to reflect the uncertainty of the likely magnitude of impact and the sensitivity of receptors to change and resulting residual effects.

- 7.42 Mapping techniques, as well as flow diagrams and matrices (all identified by 'EC Guidelines on Indirect and Cumulative Impacts' as useful assessment methods), will be used wherever possible to ensure that assumptions and interdependencies between impacts and effects are clearly presented within the assessment.

Transboundary effects

- 7.43 The transboundary impacts are the impact of the Proposed Development on countries outside of the UK, within the EEA (European Economic Area). In socio-economic terms, the transboundary impacts are the potential trade diversion of visitors who would have otherwise spent their money elsewhere in the EEA. This section summarises the likely methodology for estimating transboundary effects. The assessment will consider the Planning Inspectorate's Advice Note 12 'Development with significant transboundary impacts consultation'.

- 7.44 There are three groups of people that need to be considered in terms of social and economic transboundary impacts:

- UK residents who would have otherwise travelled abroad without the Proposed Development but will stay in the UK due to the Entertainment Resort;
- additional visits of EEA residents to the UK where the trip is diverted from a trip which would otherwise have been elsewhere within the EEA;
- EEA tourists who stay for a longer period on their existing trip.

- 7.45 In considering the potential transboundary impacts from a socio-economic perspective, the analysis will distinguish between net additional transboundary trips and net additional visitors arising from the Proposed Development, as follows.

- The **net additional visits** are the additional visits (including lengthened trips) from abroad plus the UK residents who holiday in the UK instead of going abroad. This is a positive for the UK economy but could have negative transboundary impacts on neighbouring countries in terms of socio-economic impacts.
- The **net transboundary trips** generated is the additional overseas visitors minus the UK residents who would have travelled abroad, i.e. in transport/travel terms the additional international travel of overseas visitors travelling to the Proposed Development is to some extent offset by the reduction of outward travel by UK residents. This is the relevant input into assessing the transboundary transport impact and the associated environmental impacts.

7.46 The assessment will consider:

- **The extent to which trade will be diverted both through attracting overseas tourists and retaining UK tourists:** this analysis will consider evidence from comparable international attractions on the motivation for trips to estimate total additional visits; and
- **The origin of these trips to understand if there will be a significant impact on any of the EEA states:** the analysis will estimate the trips diverted from existing global theme parks to understand whether this would be significant in the context of their existing visitor base.

7.47 The applicant acknowledges the suggestion in the 2014 Scoping Opinion to consult early with potentially affected EEA states to ensure the ES includes sufficient information to determine the potential for significant effects. The applicant requests guidance on how to consult EEA states from the Planning Inspectorate – please could the Planning Inspectorate provide details on the specific contacts and provide any examples of where this has been undertaken successfully?

Cumulative effects

7.48 The assessment will present the future projections of population and employment. Therefore, as the assessment takes into account changes in employment and population over time, changes occurring as a result of potential new developments are implicitly included within the assessment. The assessment is therefore inherently cumulative and a separate assessment of the cumulative impact of committed schemes would risk double counting. Based on this approach, the need for a cumulative effects assessment which considers the overall impact of other, committed schemes is redundant. Where possible, this approach will use projections informing the cumulative assessment for other technical aspects, such as transport, to ensure consistency across the ES. Where differences in approach exist (as are inherent in any models relying upon economic forecasts), these will be clearly explained and the implications of any differences described.

Approach to assessment of significance

7.49 There is no UK legislation or guidance for the assessment of socio-economic effects. Effects are identified from the interaction between the magnitude of impacts and the sensitivity of receptors.

7.50 Sensitivity of receptors is defined as high, medium or low. The receptor sensitivity will be assessed on a case by case basis, using professional judgment informed by the baseline statistics, although broad definitions of the receptor sensitivities are given in the table below.

Table 7.4: Definitions of receptor sensitivities for the purpose of the socio-economic assessment

Sensitivity of receptor	Definition
High	Represents a very significant and persistent socio-economic problem. The effect of changes to the receptor would be highly noticeable possibly due to surplus capacity/high scarcity.
Medium	Represents a moderate socio-economic problem. Changes to the receptor would bring about noticeable changes in conditions in the area.
Low	It is performing well and/or does not represent a socio-economic problem and is largely insensitive to changes in baseline conditions.

7.51 The assessment of magnitude of impact will be undertaken based on expert judgment as there are as there are no industry standard criteria. The magnitude of impact is the degree of change in the socio-economic determinant compared to the baseline. Magnitude is assessed as high, medium, low or negligible.

7.52 The table below shows how the magnitude of impact and sensitivity of receptor combine to determine the scale of the effect. Effects can be either beneficial, adverse or neutral; temporary or permanent; direct or indirect; and, reversible or irreversible.

Table 7.5: Summary of how the magnitude of impact and sensitivity of receptor combine to determine the scale of a socio-economic effect.

Significance magnitude	Sensitivity of receptor		
	High	Medium	Low
High	Major	Major	Moderate
Medium	Major	Moderate	Minor
Low	Moderate	Minor	Negligible
Negligible	Minor	Negligible	Negligible

7.53 Effects that are classified as moderate or major are significant.

PROPOSED AVOIDANCE AND MITIGATION MEASURES

7.54 This assessment will identify mitigation measures to help reduce significant adverse effects.

7.55 The chapter will outline mitigation measures that will look to maximise the local benefits of the Proposed Development, particularly in relation to local jobs and spending.

UNCERTAINTIES

7.56 As explained in the assessment methodology section, there are several uncertainties relating to the evolution of the baseline and forecasting the impact of the Proposed

Development. The assessment will deal with this through transparency of assumptions and scenario testing. For example, there is uncertainty relating to (among other things): the number of visitors, net employment, impact on housing supply, displacement from other tourist attractions. The assessment will consider scenarios to reflect the uncertainty in these projections.

MATTERS TO BE SCOPED OUT

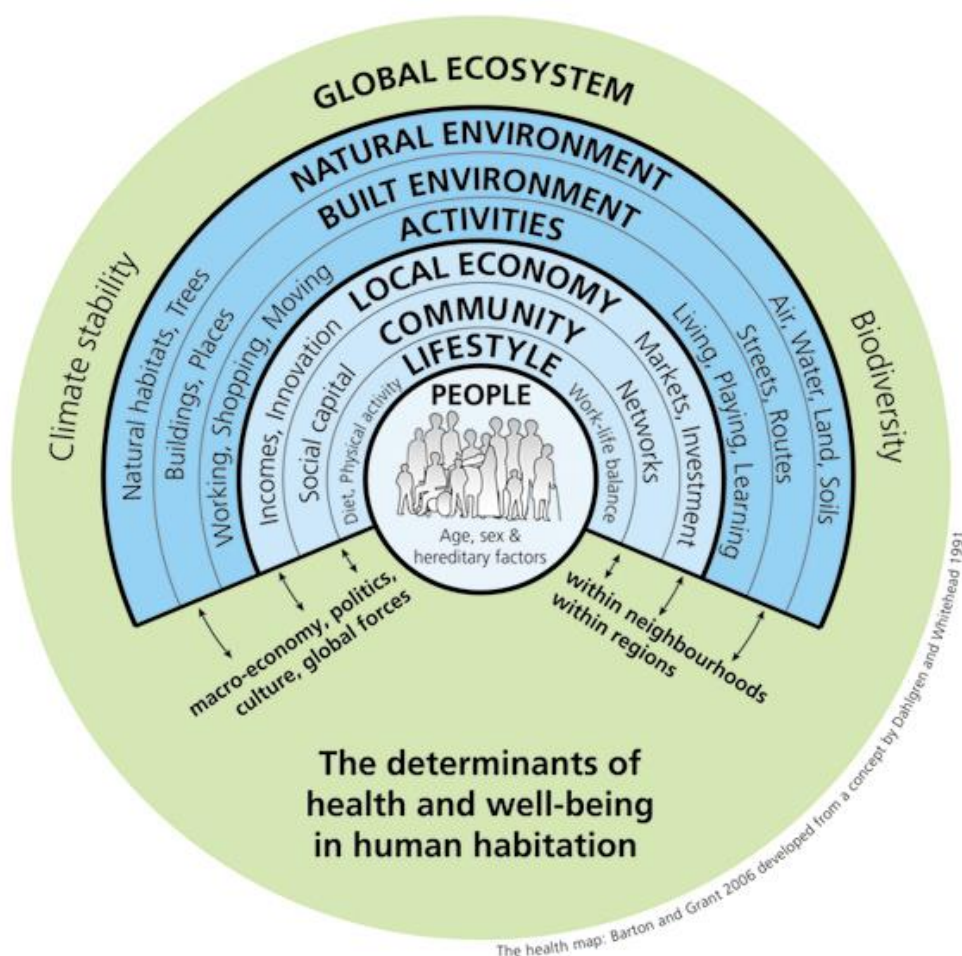
7.57 No socio-economic effects are scoped out.

Eight ◆ Human health

INTRODUCTION

- 8.1 This chapter explains the approach to measuring the potential range of human health effects that are likely to be generated by the construction and operation of the Proposed Development.
- 8.2 The requirement to consider human health in EIA was introduced in the 2017 EIA Regulations. However, there is no statutory guidance on assessing health impacts in the context of EIA. The assessment of human health effects relating to the Proposed Development will form a standalone human health chapter of the ES. The NHS Health Urban Development Unit states that health impact assessments (HIA) can be completed as standalone assessments or part of EIAs. This chapter therefore has the dual role of being the HIA and reporting the likely significant human health effects for the EIA.
- 8.3 Factors that have the most significant influence on the health of a population are referred to as determinants of health. Across a broad scale, these include, at the lowest level, an individual's genetics and their lifestyle, and broadening out to include the surrounding environment, as well as policy, cultural and societal issues (Figure 8.1, overleaf).
- 8.4 Development and planning can play a role within the wider determinants of health and well-being. This assessment considers the ways in which the Proposed Development may affect these determinants of health and wellbeing. It also considers health inequalities and how the Proposed Development may affect different groups in different ways.
- 8.5 This scoping text describes which health determinants are relevant to the Proposed Development and sets out the health effects that will be assessed. Refer to the assessment methodology text for more detail on the scope of the assessment.
- 8.6 The London Healthy Urban Development Unit Planning for Health Rapid Health Impact Assessment (HUDU Rapid HIA) Tool and checklist is used as a guide to identify the relevant health determinants and health effects associated with the Proposed Development.
- 8.7 Where significant effects arise, the assessment will present appropriate mitigation to minimise any adverse effects. It will also include measures to secure and enhance positive effects of the Proposed Development.

Figure 8.1: General determinants of health



Source: Barton, H. and Grant, M. (2006) A health map for the local human habitat. *The Journal for the Royal Society for the Promotion of Health*, 126 (6). pp. 252-253.

RELEVANT LAW, POLICY AND BEST PRACTICE EVIDENCE

8.8 The key legislation is the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (EIA Regulations). The requirement to consider human health in EIA was introduced in the 2017 EIA Regulations. However, there is no statutory guidance on assessing health impacts in the context of EIA. As noted below, this assessment of health will cross reference the technical assessments undertaken for the other technical disciplines in the EIA. Legislation that is relevant to other technical assessments will therefore be indirectly accounted for in this assessment.

Policy

8.9 This section identifies the relevant socio-economic national, regional and local policies that have informed the scope of the assessment presented in this chapter. Further

information on the policies associated with this chapter are contained in chapter three of this Scoping Report.

8.10 National Policy Statements (NPS) set out the need for and government’s policies to deliver Nationally Significant Infrastructure Projects (NSIPs) in England. Chapter three of this scoping report explains that there is no NPS for business and commercial NSIP projects. However, to the extent that the Proposed Development includes transport and highways infrastructure, regard will be had to relevant policy in the NPS for National Networks, including the policy on health in NPS paragraphs 4.79 to 4.82.

8.11 Other policy potentially of relevance to the current assessment is identified in Table 8.1.

Table 8.1: Polices of potential relevance to the assessment of health effects

Policy	Relevance to socio-economics
National Planning Policy Framework (NPPF) (2019) ¹	<p>The National Planning Policy Framework sets out the Government’s planning policies for England and how these should be applied. Key objectives of the planning system relating to health are:</p> <ol style="list-style-type: none"> 1. a social objective – to support strong, vibrant and healthy communities, by ensuring that a sufficient number and range of homes can be provided to meet the needs of present and future generations; and by fostering a well-designed and safe built environment, with accessible services and open spaces that reflect current and future needs and support communities’ health, social and cultural well-being 2. planning policies and decisions should: take into account and support the delivery of local strategies to improve health, social and cultural well-being for all sections of the community
Regional and sub-regional planning policy: South East Local Enterprise Partnership Kent and Medway Economic Partnership The Thames Gateway Kent Partnership Kent County Council Thames Gateway South Essex	There are four regional/sub-regional bodies that cover the area of the Project Site. Each of these bodies have policies and documents which outline health ambitions for the area.
Relevant local policy from: • Dartford Borough	The LPAs have local plans, economic strategies, development policies and corporate strategies, all of

¹ Ministry of Housing, Communities and Local Government (February 2019), National Planning Policy Framework

Policy	Relevance to socio-economics
Council <ul style="list-style-type: none"> • Gravesham Borough Council • Thurrock Council • Ebbsfleet Development Corporation 	which contain policies of relevance to health.

Guidance

There is no statutory guidance on assessing health impacts for EIA, however, there are some well-established guides available for HIA as set out in Table 8.2 below.

Table 8.2: Guidance

Document	Description
Institute of Environmental Management and Assessment, 2017: Health in Environmental Impact Assessment: A Primer for a Proportionate Approach. ²	A primer for a proportionate approach to health assessment in EIA.
Health Impact Assessment: a practical guide. ³	This guide, produced by the Wales Health Impact Assessment Support Unit (WHIASU) describes the process, provides methods and lists resources to support Health Impact Assessment (HIA).
Healthy Urban Planning Checklist. ⁴	<i>‘The checklist aims to promote healthy urban planning by ensuring that the health and wellbeing implications of local plans and major planning applications are consistently taken into account. By bringing together planning policy requirements and standards that influence health and wellbeing the checklist seeks to mainstream health into the planning system.’</i>

THE 2014 SCOPING OPINION

8.12 The 2014 Scoping Opinion noted that:

² IEMA (undated), health in environmental impact assessment. A primer for a proportionate approach.

³ WHIASU, Health Impact Assessment, a practical guide.

⁴ NHS HUDU, Healthy Urban Planning Checklist. Third Edition. April 2017

'The Secretary of State considers that it is a matter for the applicant to decide whether or not to submit a stand-alone Health Impact Assessment (HIA). However, the applicant should have regard to the responses received from the relevant consultees regarding health, and in particular to the comments from the Health and Safety Executive and Public Health England.

The methodology for the HIA, if prepared, should be agreed with the relevant statutory consultees and take into account mitigation measures for acute risks.'

8.13 At the time, Public Health England and the Health and Safety Executive offered advice concerning the assessment of potential effects on human health. In addition to comments on the general approach and receptors, these comments relate to:

Public Health England

- Impacts arising from emissions due to construction and decommissioning;
- Emissions to air and water;
- Land quality;
- Waste;
- Electromagnetic fields;
- Liaison with other stakeholders (PHE lists several stakeholders); and
- Other aspects (responding to accidents with potential off-site emissions, consideration of the Control of Major Accident Hazards (COMAH) regulations and the major accident off-site emergency plan, consideration of perception of risk and the impact on health).

Health and Safety Executive:

8.14 The HSE noted that they do not comment on EIA Scoping Reports, though they do provide some land use planning advice. HSE notes that there are unlikely to be issues relating to major hazard installations, hazardous substances or explosive sites. The response notes that the Applicant should consider issues relating to waste and electrical safety. As described in the matters to be scoped out section below, waste issues will be addressed in **chapter 18: waste and materials** and all the relevant health and safety requirements will be followed as per UK legalisation. The safety requirements for electrical safety are the responsibility of the construction site team and management plans developed for the project will refer to all relevant health and safety legislation required. There is a site wide energy strategy being developed, which will engage closely with stakeholders on the existing generation, transmission and distribution required for the Project Site area and the London Resort.

8.15 The health issues outlined in the 2014 Scoping Opinion have therefore been addressed.

8.16 In order to address those issues, an assessment of human health has been scoped into the EIA. The requirement to consider human health in EIA was introduced in the 2017 EIA Regulations and it wasn't required when the scoping opinion was submitted in 2014.

CONSULTATION FEEDBACK

- 8.17 In 2014/15, London Resort carried out several stages of public consultation. Engagement with local authorities and the EDC took place on a range of matters including health impacts during construction and once operational, with a focus on health provision on site and engagement with the NHS and CCGs. Further engagement was then also carried out with the NHS/CCGs where the approach to assessing health impact was explained.
- 8.18 General feedback was that the health providers would like to be pro-actively involved more closely in the plans for onsite health provision and any emergency services. The applicant was also encouraged to be innovative with regards how health could be incorporated into the proposals in an interactive and fun way, rather than solely a focus on accidents and emergencies.

BASELINE CONDITIONS AND MAIN ISSUES

- 8.19 The baseline will be assessed at a high level to understand the importance of each health determinant to the area and will be established with reference to the following sources.
- A desktop review of the characteristics of the Project Site and the local area with information available from published database records such as the Department for Health, Public Health England, the National Health Service and the Office for National Statistics. This will also consider assessments from LPAs (such as Joint Strategic Needs Assessments) and CCGs. This will also consider the health characteristics of the borough as a whole and other information on local deprivation levels, health facilities, crime, obesity rates, and open space provision.
 - Other technical pieces of work that either comprise part of the ES or are standalone documents that will be prepared and submitted in support of the DCO application. The key technical documents and information are:
 - Land use and socio-economic effects
 - Land transport
 - River transport
 - Landscape and visual effects
 - Noise
 - Air quality
 - Water resources and flood risk
 - Soils, hydrogeology and ground conditions
 - Waste and materials
 - Design and access statement

PRELIMINARY ASSESSMENT OF POTENTIAL EFFECTS

8.20 The following Table 8.3 summarises the likely potential effects as a result of Proposed Development.

Table 8.3: Likely potential effects

Activity	Effect	Receptor
CONSTRUCTION EFFECTS		
Displacement to land and property as a result of the land take	Potential effect of displacement or change in access affecting public services	Local residents
	Potential effect of displacement or change in access to open spaces	Local residents and visitors
	Potential effects from displacement of commercial uses	Local businesses
	Potential changes to local traffic and transport and changes in use of active travel modes	Local residents and visitors
	Potential effect of increased flooding	Local residents
Construction activity	Potential effect of construction resulting in changes in noise and vibration	Local residents
	Potential effect of construction resulting in changes in air quality	Local residents
	Potential effects of the presence of the construction workforce	Local residents
	Potential effect of work and training opportunities created	Local residents
OPERATIONAL EFFECTS		
Noise exposure	Any potential health effects associated with changes in noise and vibration	Local residents
Air quality	Any potential health effects associated with changes in air quality	Local residents
Traffic and transport	Potential health effects from a change in local traffic and active travel	Local roadside receptors
Electromagnetic field exposure	Potential health effects associated with changes in electromagnetic field exposure	Local residents and workers
Inclusive design	Potential health effects associated with the inclusive design, site access and facilities of the Proposed Development	Visitors and workers
Existence of the Proposed Development	Potential health effects relating to changes in access to work and skills	Local residents
	Potential effects from a change in the demand for health services	Local residents and workers
	Potential effects from a change in the demand for public services	Local residents and workers

Activity	Effect	Receptor
	Potential effects associated with open space provision and amenity space	Local residents and workers
	Potential effects from changes in community cohesion	Local residents
	Potential effects from changes in crime and community safety (including fear of crime)	Local residents

APPROACH AND METHODOLOGY

8.21 The following outlines the proposed approach to assessing the likely significant effects shown above. The assessment will draw on existing analysis and methods established for other similar, large projects, as well as policy, standards and guidance.

Study areas

8.22 Health effects are considered at varying spatial levels according to the nature of the effect and the aspect of the Proposed Development that gives rise to that effect. The relevant technical assessments of the EIA influence the study area for health impacts relating to each relevant technical area. For example, where noise and vibration impacts are defined within a given radius of the Project Sites, the health impacts associated with those noise and vibration impacts are considered at the same radius. The full breakdown of spatial levels by effect will be summarised in the assessment.

Baseline

8.23 As with any dataset, the health baseline will change over time. The ES chapter will firstly define the existing baseline health conditions of the environment surrounding the Project Site. This will be undertaken using the most recent published sources: data sources published in 2019 or 2020 will be used where possible, but where this is not available the next best alternative (i.e. the most up to date) will be used as a proxy. The assessment will present baseline data over a reasonable period of time where possible so that the impact of any short-term shocks or changes can be identified in the baseline. This may be relevant to the impact of COVID-19 on health, social and demographic baseline data. This will be discussed in the assessment and any conclusions drawn from the analysis will be based on longer term trends. This will be clearly described in the ES.

8.24 The future baseline will outline the trends in public health – such as trends in life expectancy, inequalities and child health – to understand how the baseline could change between the baseline data and the opening of the Proposed Development. The health trends will be used to understand how the baseline and sensitivity to populations could change. The future baseline population itself will also be included and will be based on local authority forecasts, consistent with the approach taken within the socio-economic chapter, and thus implicitly including any committed pipeline schemes within this future

baseline position.

- 8.25 Where information on how the existing baseline conditions are likely to change between now and the opening year of the Proposed Development are unavailable (for example, information on crime), or the future baseline is not expected to change materially from the existing baseline (for example, open space and play space), it will be assumed that the future baseline is unchanged from the existing baseline.
- 8.26 On the whole, however, the future baseline will be informed by the other EIA aspects.

Potential sensitive receptors

- 8.27 For health effects, the receptor sensitivity is determined by the number of people exposed to the health effect and the extent to which the exposed population experiences inequalities in health or can access services and facilities. Potential vulnerable groups and an explanation of how receptor sensitivities are assessed based on the interaction between these two types of population are explained in the assessment methodology section below.

Assessment of potential effects

- 8.28 The assessment of health will cross reference to the technical assessments undertaken for the other technical disciplines in the EIA, highlighting any conclusions reached which are relevant to human health. Rather than simply repeating the conclusions reached in these other disciplines, however, the focus of the health assessment will be on considering the extent to which these conclusions have any effect (or not) upon the health of the local population. The thresholds for significance in these technical chapters are not always based upon population health, whereas this will be the focus of the health assessment. To do this, it will be important to establish health pathways – these determine the relationships between the Proposed Development and potential health impacts on the population and will be assessed through a literature review and stakeholder engagement. For example, the literature review will consider the relationship between air quality and health effects, and how this differs by group.
- 8.29 An appendix to the assessment will summarise the literature on the links between health determinants and effects on individuals' health. The appendix will contain the evidence base which underpins the assessment of health effects of the Proposed Development.
- 8.30 The health assessment considers the residual effects of other EIA technical assessments – i.e. it only considers the effects post-mitigation.
- 8.31 There will be a phased approach to the London Resort, known as Gate One and Gate Two. The assessment will consider several core assessment years to account for the lengthy nature of the construction period and the phased approach to opening, these include 2025 (1st full year after Gate 1 opens), 2030 (1st full year after Gate 2 opens) and 2039 (maturity – a proxy for when London Resort is fully operational and established). The core

assessment year may vary dependent on the nature of the effect. The reasons for this could include the year being the peak and therefore worst case for some effects (other effects like visitor / tourism impacts will be assessed on non-peak scenarios), or because it is a specific point in time when something relevant occurs which it is important to consider within the assessment.

8.32 The core assessment year will be informed by each EIA aspect.

Cumulative effects

8.33 The assessment will present the future projections of population and employment. Therefore, as the assessment considers changes in employment and population over time, changes occurring as a result of potential new developments are implicitly included within the assessment. The assessment is therefore inherently cumulative and a separate assessment of the cumulative impact of committed schemes would risk double counting. Based on this approach, the need for a cumulative effects assessment which considers the overall impact of other, committed schemes is redundant. The only exception to this is where specific cumulative schemes have a direct impact upon health provision or health outcomes (e.g. a scheme including a hospital or increase to open space). In these instances, the impact of this would be explicitly included here in the cumulative assessment.

Approach to assessment of significance

8.34 There is no UK legislation or statutory guidance for the assessment of health effects. Effects are identified from the interaction between the magnitude of impacts and the sensitivity of receptors.

8.35 Sensitivity of receptors is defined as high, medium or low. The receptor sensitivity will be assessed on a case by case basis, using professional judgment, although broad definitions of the receptor sensitivities are given in the table below.

Table 8.4: Definitions of receptor sensitivities for the purpose of the socio-economic assessment

Sensitivity of receptor	Definition
High	Represents a very significant and persistent socio-economic problem. The effect of changes to the receptor would be highly noticeable possibly due to surplus capacity/high scarcity.
Medium	Represents a moderate socio-economic problem. Changes to the receptor would bring about noticeable changes in conditions in the area.
Low	It is performing well and/or does not represent a socio-economic problem and is largely insensitive to changes in baseline conditions.

8.36 For health effects, the receptor sensitivity is determined by the number of people exposed to the health effect and the extent to which the exposed population experiences

inequalities in health or can access services and facilities.

- 8.37 Vulnerable groups include those with higher levels of social deprivation or relatively poor health status. Examples include:
- Age-related groups, such as children and older people;
 - Income-related groups, such as the unemployed;
 - People suffering with long-term illnesses or mental health issues;
 - Disabled groups; and
 - Ethnic minority groups.
- 8.38 For example, if the open space baseline found an existing deficiency in local open space, high numbers of children and low levels of physical activity, the sensitivity of the population (including vulnerable groups) to health effects will be high.
- 8.39 The assessment of magnitude of impact will be undertaken based on professional judgment as there are no industry standard criteria. But, in general, the assessment of health impacts will consider factors such as the strength of the evidence base, the exposure, whether regulatory standards are met and change from the baseline position. Magnitude is assessed as high, medium, low or negligible.
- 8.40 The table below shows how the magnitude of impact and sensitivity of receptor combine to determine the scale of the effect. Effects can be either beneficial, adverse or neutral; temporary or permanent; direct or indirect; and, reversible or irreversible. Effects that are classified as moderate or major are significant.

Table 8.5: Summary of how the magnitude of impact and sensitivity of receptor combine to determine the scale of a health effect.

Significance magnitude	Sensitivity of receptor		
	High	Medium	Low
High	Major	Major	Moderate
Medium	Major	Moderate	Minor
Low	Moderate	Minor	Negligible
Negligible	Minor	Negligible	Negligible

PROPOSED AVOIDANCE AND MITIGATION MEASURES

- 8.41 This assessment will identify mitigation measures to help offset or avoid significant negative effects. Since the health assessment will account for mitigation defined by other EIA technical assessments (in other words, it focuses on residual effects), they will not be replicated in the chapter. This limits the opportunities for further mitigation because mitigation will have already been incorporated into other EIA aspects. This assessment will however consider ways to reduce impact on health and wellbeing.

UNCERTAINTIES

- 8.42 Lots of the data informing the assessment of health effects are from other EIA disciplines. The assumptions and uncertainties from those assessments also apply to this assessment.
- 8.43 There are several uncertainties relating to the evolution of the baseline and forecasting the impact of the Proposed Development. Where there is uncertainty, the assessment will deal with this through applying worst case approaches and transparency of assumption.

MATTERS TO BE SCOPED OUT

- 8.44 The effects outlined in the following table are anticipated to be not significant and hence are proposed to be scoped out of this chapter of the ES.

Table 8.6: Matters proposed to be scoped out of the assessment of health effects

Activity	Effect	Justification
Waste	Potential effects from hazardous waste	The Proposed Development will be regulated by the Environmental Agency as part of the consenting process. These existing controls will ensure that the Proposed Development does not affect human health and it is therefore assumed that there would not be any likely significant effects. The assessment will cross refer to chapter 18: waste and materials.
Land quality	Potential effects associated with exposure to contamination in soil	This matter is proposed to be scoped out of the health assessment as it will be addressed in chapter 17: soils, hydrogeology and ground conditions.
Water quality	Potential effects on human health from poor water quality	The Proposed Development will be regulated by the Environmental Agency as part of the consenting process. These existing controls will ensure that the Proposed Development does not present a risk of danger to water quality that would affect human health. It is therefore assumed that there would not be any likely significant effects. The assessment will cross refer to chapter 16: water resources and flood risk.
Electrical safety	Potential effects associated with electrical safety	The safety requirements for electrical safety are the responsibility of the construction site team and management plans developed for the project will refer to all relevant health and safety legislation required. There is a site wide energy strategy being developed, which will engage closely with stakeholders on the existing generation, transmission and distribution required for the site area and the London Resort.
Climate change	Potential effects associated with a changing global climate	This matter is proposed to be scoped out of the health assessment as a climate change assessment will be undertaken to consider resilience to global climate change and measures required to adopt to a changing climate. The assessment will

Activity	Effect	Justification
		cross refer to chapter 10: landscape and visual effects, chapter 11: terrestrial ecology and biodiversity, chapter 12: marine ecology and biodiversity, and chapter 16: water resources and flood risk.

Nine ◆ Transport, accessibility and movement

INTRODUCTION

- 9.1. This chapter sets out the proposed approach to the assessment of transport, accessibility and movement forming part of the EIA for the London Resort, and how it will be reported in the Environmental Statement (ES).
- 9.2. The chapter primarily considers the potentially significant environmental impacts resulting from the construction and operation phases of the Proposed Development on land based transport. The final section of this chapter provides the relevant scope for the assessment of river transport and navigation. In the ES, river transport and navigation will have its own chapter.
- 9.3. This chapter sets out:
- relevant legislation and transport policy context;
 - a summary of the scoping opinion issued by the Planning Inspectorate for the project in 2014, as it related to land transport;
 - a summary of the main transport considerations highlighted by consultees;
 - the baseline transport conditions in the local area surrounding the Proposed Development;
 - the potential effects of the Proposed Development;
 - the methodology proposed for the assessment and details of the criteria used to determine the resulting significance;
 - potential mitigation or control measures required to reduce or eliminate adverse effects;
 - uncertainties;
 - matters to be scoped out.
- 9.4. The land transport, accessibility and movement chapter of the ES will not be intended to be read as a stand-alone assessment, but as part of the wider ES. Reference will be made to several documents such as the Transport Assessment (TA) including accompanying Transportation Technical Notes (TTN) and a Framework Travel Plan (FTP), which will be all submitted as part of the DCO application, to inform its examination.

Context

- 9.5. A description of the Project Sites and the Proposed Development are provided in chapter five of this EIA Scoping Report.
- 9.6. The TA, associated TTNs and other supporting documents will provide a sound basis for the assessment as they are concerned in detail about the issues such as travel demand,

transport mode share, trip distribution and transport modelling amongst other things.

- 9.7. It is forecast that across the year in 2029 (when the full Project Site is expected to be operational) the daily visitor travel demand will vary between 7,000 to 53,000 with an average of around 26,000 visitors with the TA and other associated documents detailing its variability. It is proposed that an 85th percentile assessment day will form the basis of the assessment of circa 35,000 with only 54 days a year exceeding this level which generally occur at weekends or during holiday periods.

RELEVANT LAW, POLICY AND GUIDANCE

Law and policy

- 9.8. The assessment of the transport effects of the Proposed Development will be based on law, policy and current best practice identified in this section and more generally on chapter two of this Scoping Report. As chapter two explains, the relevant EIA regulations are the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017.
- 9.9. The land transport, accessibility and movement chapter of the London Resort ES will provide a review of legislation and policies relevant only to the assessment of transport. A review of policies that inform the assessment of other aspects of the environment will be provided elsewhere in the ES.

National Policy Statements

- 9.10. National Policy Statements (NPS) set out the need for and government's policies to deliver Nationally Significant Infrastructure Projects (NSIPs) in England. Chapter three of this scoping report explains that there is no NPS for business and commercial NSIPs. However, to the extent that the Project includes transport, highways and port infrastructure, regard will be had to relevant policy in the National Networks NPS (2014) and the NPS for Ports (2012).

Other national policy and guidance

- National Planning Policy Framework (NPPF), February 2019;
- National Planning Practice Guidance (NPPG), March 2019, including;
 - Environmental Impact Assessment Guidance
 - Transport Evidence Base in plan making and decision taking
 - Travel Plans, Transport Assessments and Statements

Local policy

- (Kent) Local Transport Plan 4: Delivering Growth without Gridlock 2016-2031, 2016;
- Freight Action Plan for Kent, 2016;

- Rail Action Plan, April 2011
- Thurrock Core Strategy 2011
- Dartford Core Strategy 2011
- Gravesham Local Plan 2014

Best practice guidance

9.11. The methodology for assessing the Proposed Development's traffic and transport effects will be based on the following guidance documents:

- (IEMA) Guidelines for the Environmental Assessment of Road Traffic, 2004;
- Design Manual for Roads and Bridges Volume 11, July 2019 and January 2020;
- Transport Analysis Guidance (WebTAG), October 2019;
- PINS Advice Note Nine: Rochdale Envelope – using the Rochdale Envelope, July 2018.

THE 2014 SCOPING OPINION

9.12. London Resort Company Holdings Ltd sought and received a scoping opinion for the project in 2014. Summarised below are the key responses received a number of stakeholders during the 2014 scoping opinion consultation with regards to transport and how these will be addressed this time around.

- Robust trip generation assumptions to support technical work – *Trip generation, distribution and mode share will be addressed as part of the Technical Notes supporting the Transport Assessment*
- Important to consider thoroughly the quantum of developments within the local plan – *addressed by use of the Highways England A2 Bean and Ebbsfleet (A2B&E) model and the Lower Thames Crossing, which includes most up to date development projections*
- Requirement to disaggregate visitor, employment and servicing trips – *will be addressed as part of the Technical Notes supporting the Transport Assessment*
- Consideration of the Lower Thames Crossing – *this is being addressed through on-going discussions with Highways England*
- Request that stress and delay upon public transport users are assessed- *this will be considered within the Transport Assessment and be addressed in the ES Transport Chapter*

- Parking management – *a future mobility study will be undertaken to explore the options available with regards to parking management, alongside suitable ticketing strategies.*

CONSULTATION FEEDBACK

- 9.13. In 2014/15, London Resort carried out several stages of public consultation. This included general consultation material on the scheme which the general public were invited to, as well as a series of targeted workshop events, which included events related to transport effects.
- 9.14. Furthermore, consultation has been undertaken with the following stakeholders:
- Highways England (HE)
 - Kent County Council (KCC)
 - Dartford Borough Council
 - Ebbsfleet Development Corporation
 - Gravesham Borough Council
 - Thurrock Council
 - High Speed 1 (HS1)
 - Port of Tilbury (London) Limited
 - Thames Clippers (TC)
- 9.15. With regards to the general public the key feedback was support for the scheme, tempered by concerns over the transport impacts on the existing residents within the local area and how this would be mitigated.
- 9.16. Discussions have continued with Highways England, Kent County Council and highway authorities affected by the proposals. This has been through submission of technical work and associated feedback from the authorities. The key feedback from these submissions related to:
- The need for robust supporting evidence for the visitor forecasts used;
 - Further consideration in how the development can support high public transport mode shares;
 - A suitable parking management scheme to reduce reliance upon private vehicles;
 - Support for the use of river and rail based travel modes to the London Resort.
- 9.17. There has been a fundamental shift in the Transport Strategy with the introduction of facilities at Port of Tilbury, London (PoTL). PoTL has agreed to accommodate a new car park (plus ancillary visitor services) north of the river, and to allow access to the river for a new ferry service connecting the resort to the PoTL. Furthermore, PoTL will also now be the hub for the majority of construction material and operational servicing for the resort.

- 9.18. An agreement has been reached with Thames Clippers to provide new river-based passenger services to the London Resort from PoTL and central London.

BASELINE CONDITIONS AND MAIN ISSUES

- 9.19. The baseline conditions will form a key component of the Transport Assessment of the Environmental Assessment and will consider the existing conditions of the following networks:
- highway network
 - rail services provision
 - public transport provision
 - walk and cycle audits
- 9.20. Baseline conditions were identified in 2017 in preparation of the previous PEIR which will be used as a basis for ongoing work. Given the current Covid-19 situation, new traffic flow surveys cannot be undertaken, however where possible relevant existing data will be utilised. If suitable and achievable going forward, further identification of baseline information will be undertaken through a combination of site visits and desktop studies of the local area, which will include Dartford, Gravesham and Thurrock as a minimum.
- 9.21. Taking the above areas in turn, these are the key baseline conditions that the ES will consider in depth.

Highway network

- 9.22. Visitors to the Proposed Development will travel from all over the country and will primarily utilise the strategic road network to reach the Project Site. This will primarily see visitors using the M25, A2(T) and A13 corridors. This part of Kent is known to be a busy part of the network during peak hours, notably the Dartford Crossing, which is one reason that the Proposed Development has sought a new parking arrangement north of the River. Furthermore, the local road network within Swanscombe, as a result of the development of Ebbsfleet Garden City, will see increased traffic which will need to be taken into account.

Rail services

- 9.23. The Proposed Development will be looking to utilise rail travel as a key component to the access strategy, noting the direct routes into London, a key attractor to the London Resort. HS1, through Ebbsfleet International station, provides direct access to London St Pancras International Station in 17 minutes with 2-3 trains per hour. Furthermore, there are local services that will perform a key travel choice for staff and visitors in the local area to the Project Site.

9.24. The London Resort is aware of proposals to extend the Elizabeth Line (Crossrail) to Ebbsfleet and has responded positively to consultations on the options. Whilst supportive of this initiative the London Resort development is not dependent upon delivery of an extension to the Elizabeth Line.

Public transport

9.25. A key transport option within the Ebbsfleet area is the FastTrack bus service which connects many of the key residential, commercial and retail areas. This is a high frequency bus service that, in places, has its own dedicated highway. The proposals will see the Fastrack bus routes linked into the Proposed Development enabling access for residents, visitors and staff.

Walk and cycle audits

9.26. There are a number of public highways that cross the Project Site, which where necessary will be diverted but will retain continued access. The proposed vehicle access corridor has been designed in a way as to reduce its impact upon existing pedestrian routes, with the main location where additional severance may be identified is at the Ebbsfleet Junction.

9.27. It is proposed that access via the local road network is kept to local servicing only to minimise the impact upon walking and cycling, with access being gained directly from the A2(T) via a segregated access road. That being said, the master-planning of the Project Site will see enhancements to the public footway provision to enable suitable walking and cycling access to the Proposed Development for local residents.

9.28. The emerging master plan for the London Resort incorporates public access to the ferry services on the River Thames with links to central London.

Transport network improvements

9.29. Several transport-related developments and/or developments having a significant impact on the transport networks in the area will be considered as part of the assessment. These include both completed and planned/committed schemes, as follows:

Strategic Road Network

- M25 junction 30/A13 corridor, completed Autumn 2016;
- M20 junctions 3 to 5 - smart motorway, completed March 2020;
- M2 junction 5 improvements, planned for 2020 with the completion date to be confirmed;
- A2(T) Bean and Ebbsfleet junction improvement, consented on 1 June 2020, planned for construction to start in 2020 with completion in 2023;

- Lower Thames Crossing, an NSIP project currently in a pre-application public consultation stage and expected to be applied for in autumn 2020;
- M25 junction 25 improvements, planned for 2021 with the completion date to be confirmed;
- M25 junction 28 improvements, applied for in May 2020 and planned for 2022 with the completion date to be confirmed;
- A12 Chelmsford to A120 widening scheme, planned for 2024 with the completion of c.2028;

London Transport Network

- The Elizabeth Line (connecting to HS1), expected completion in 2021;
- Silvertown Tunnel, construction to begin in 2020, expected completion in 2025;

Other

- Tilbury 2 – Port of Tilbury expansion, enabling works commenced with the completion date to be confirmed.

PRELIMINARY ASSESSMENT OF POTENTIAL EFFECTS

Network capacity

- 9.30. Junction modelling during 2017 identified constraints on the highway network along the A2(T) corridor and the junction with the M25. Since then it should be noted that not only are reduced visitor and employee numbers for the London Resort now forecast, but traffic volumes are further mitigated by the proposal to construct a park and ferry facility within the Port of Tilbury. Initial estimates indicate around 25% of car borne Resort visitors would travel to the Resort via Tilbury. However, despite this it is still expected that the increase in traffic flow will have some impact upon the A2(T) and M25 corridors.
- 9.31. Integration with passenger services at Ebbsfleet International Station will be addressed as part of the DCO.

Transboundary effects

- 9.32. The transboundary impacts are the impact of the Proposed Development on countries outside of the UK and in the EEA (European Economic Area). In transport terms, this would be the residual impact of the additional traffic associated with the resort upon other countries.
- 9.33. It is anticipated that the vast majority of visitors from overseas will be extending existing trips to the UK or will combine a trip to the Resort with other attractions within the UK.
- 9.34. It is acknowledged that there will be some additional vehicle movements associated with

travel to the Proposed Development through the EEA. Previous assessments undertaken in 2017 identified that two thirds of existing international guests to the UK were via air travel, with a significant proportion of the remaining third of guests via river and rail. The level of visitors to the Proposed Development, in context would be a small number of total inbound movements to the UK. As part of the Proposed Development, there are no proposals to increase the frequency of any air, rail or water based international transport services. It is anticipated that vehicle movements will be a minority of traffic movements into the UK, and again will be subject to the availability of existing services on both rail and water-based transport to enter the UK. This will be addressed in detail in the Transport Technical Notes.

- 9.35. It is therefore considered that whilst transboundary effects will be considered in the ES chapter, this will not require a detailed assessment.

APPROACH AND METHODOLOGY

Traffic model

- 9.36. The assessment of transport-related effects resulting from the Proposed Development will be based on the changes in traffic volumes on the local and wider highway network.
- 9.37. Given the strategic nature of the proposals and the fact that the majority of the traffic associated with the construction and operation of the Proposed Development is expected to utilise the Strategic Road Network (SRN) and Primary Road Network (PRN), it is considered appropriate to base the assessment off a strategic transport model to determine the traffic volumes in the area.
- 9.38. Highways England has agreed to provide forecast model output from the A2 Bean and Ebbsfleet and the Lower Thames Crossing traffic models. Through continued discussions with Highways England, it is now proposed that the traffic flow data from the models will be used as a basis to create a spreadsheet-based traffic model to assess the implications of the Proposed Development. This will enable the assessment to cover the full study area.
- 9.39. Furthermore, Highways England has developed a localised micro-simulation model that covers the A2 corridor and key roads within Ebbsfleet. The micro-simulation model enables a greater level of detail to be assessed over a smaller area than the A2B&E strategic model and will include many of the key local roads within Ebbsfleet. It is proposed to utilise this model in addition to the spreadsheet-based model.

Assessment extent

- 9.40. As outlined above, the A2(T) Bean and Ebbsfleet traffic model supplemented with a cordon from the Lower Thames Crossing traffic model will be used as a base for the London Resort assessment. The model will include the highway networks both north

and south of the river. A screening process is to be undertaken to identify the appropriate extent of the assessment.

- 9.41. As suggested by the IEMA Guidelines for the Environmental Assessment of Road Traffic, it is proposed that to identify the relevant links to be assessed within the Transport Chapter, an analysis of the model data will be undertaken and application of the following rules to identify those highway links that will form part of the assessment:
- **Rule 1:** include highway links where traffic flows will increase by more than 30% due to the Proposed Development (or the number of heavy goods vehicles will increase by more than 30%).
 - **Rule 2:** include any other specifically sensitive areas where traffic flows will increase by 10% or more.
- 9.42. In accordance with the IEMA guidelines, an assessment of sensitive areas/receptors will be undertaken to identify the proximity of each to the local highway network. Locations which will be considered to be sensitive receptors/areas are:
- schools;
 - health facilities;
 - community facilities;
 - areas with significant pedestrian movements.
- 9.43. Only those links that meet the IEMA rules outlined above will be considered in detail within the transport, accessibility and movement chapter of the ES. However, these links can only be identified once the transport modelling has been completed.

Assessment scenarios

- 9.44. As outlined in the introductory chapters of the EIA scoping, the Proposed Development will consist of two parks (Gate 1 and Gate 2) and a range of associated facilities. The delivery of these proposals will be phased, and as such, it is considered appropriate to assess the following years/scenarios:
- 2025 – First full year after Gate 1 opening year;
 - 2029 – Gate 2 opening year (full development);
 - 2039 – Maturity of the Proposed Development.
- 9.45. The above scenarios will be aligned with the model years included in LTC model, with the model providing data for the following time periods:
- Weekday AM Peak Hour
 - Weekday Inter Peak
 - Weekday PM Peak
- 9.46. Highways England have a micro-simulation model of the local highway network that is available and could be used to undertake further localised sensitivity testing of the local

road network on a weekend. The weekend time period to be assessed will need to be discussed further with relevant stakeholders.

Assessment methodology

- 9.47. In line with the legislative framework, the Design Manual for Roads and Bridges (DMRB) Volume 11 provides guidance regarding the aims and objectives of environmental impact assessment, including EIA scoping, the assessment and management of environmental effects and the reporting of environmental assessments.
- 9.48. Each of the links identified for a detailed assessment using the rules outlined above will be assigned an environmental value (sensitivity) based on their importance and scale using a five-point scale set out in DMRB LA104 - Environmental Assessment and Monitoring as follows:
- Very high – Very high importance and rarity, international scale and very limited potential for substitution;
 - High – High importance and rarity, national scale, and limited potential for substitution;
 - Medium – High or medium importance and rarity, regional scale, limited potential for substitution;
 - Low – Low or medium importance and rarity, local scale; and
 - Negligible – Very low importance and rarity; local scale.
- 9.49. Following the assignment of sensitivity to the selected links, a magnitude of impact or change (either adverse or beneficial) will be assigned, also based on a scale provided in DMRB LA104. It should be noted that DMRB LA104 provides a general approach to the assessment and it is not explicitly concerned about transport and traffic. As such, the threshold values suggested by IEMA Guidelines for the Environmental Assessment of Road Traffic aimed at the effects of the transport and traffic will be applied to the DMRB LA104 scale as follows:
- Major – deterioration/improvement in local conditions or circumstances (+/- more than 90%);
 - Moderate – apparent change in conditions (+/-60 to 90%);
 - Minor – perceptible change in conditions or circumstances (+/-30 to 60%);
 - Negligible – no discernible change in conditions (+/-10 to 30%); and
 - No change – no change in conditions (+/- less than 10%).
- 9.50. Finally, the significance of effects will be assigned using a significance matrix as provided by DMRB LA 104 and reproduced in Table 9.1 (overleaf) for illustration.
- 9.51. The resulting significance of an effect will be reported considering its duration (long or short term), permanence (permanent or temporary) and the type of the impact (beneficial or adverse).

9.52. In addition to the above, DMRB LA104 also sets out several factors that must be considered in the EIA, one of which is population and human health that will be subject to assessment in the London Resort ES. It should be noted that other factors, such as air quality and noise, might be affected by transport. However, these are considered in their respective chapters.

Table 9.1: Table informing the significance of effects and magnitude of impacts based upon receptor value

		Magnitude of Impact (Degree of Change)				
		No change	Negligible	Minor	Moderate	Major
Environmental Value (Sensitivity)	Very High	Neutral	Slight	Moderate or Large	Large or Very Large	Very Large
	High	Neutral	Slight	Slight or Moderate	Moderate or Large	Large or Very Large
	Medium	Neutral	Neutral or Slight	Slight	Moderate	Moderate or Large
	Low	Neutral	Neutral or Slight	Neutral or Slight	Slight	Slight or Moderate
	Negligible	Neutral	Neutral	Neutral or Slight	Neutral or Slight	Slight

9.53. Guidance on the environmental assessment of population and human health effects in respect of traffic and transport is set out in DMRB LA 112 - Population and Human Health. It should be highlighted that historically, DMRB Volume 11 provided guidance regarding assessment techniques for assessing the environmental impacts of development on various aspects of the environment including pedestrians, cyclists, equestrians and community effects, and vehicle travellers. However, the guidance contained in the DMRB has been recently updated with several documents consolidated into more concise guidelines. This is also the case of DMRB Volume 11 with Section 3, Part 8 (Pedestrians, Cyclists, Equestrians and Community Effects) and Volume 11, Section 3, Part 9 (Vehicle Travellers) replaced by DMRB LA 112.

9.54. The guidance in the documents replaced by DMRB LA 112 was aimed at the effects of the transport and traffic. In contrast, the reach of the current document (DMRB LA 112) is broader and suggest a more qualitative approach to the assessment than the previous guidance with its thresholds and benchmarks. As a result, reporting on some of the significant environmental effects arising from traffic ad transport will be reported in the most appropriate ES chapter (e.g. noise, air quality), and some may be considered in combination with others rather than on their own (e.g. community severance).

9.55. DMRB LA 112 requires the assessment of population and human health effects to report on the following elements (and will be under separate chapters):

- land use and accessibility;

- human health.

Land use and accessibility

- 9.56. The assessment will consider likely changes to accessibility and the risk of severance for private property and housing, community land and assists, development land and businesses and agricultural landholdings.
- 9.57. The assessment of changes affecting walkers, cyclists and horse riders (WCH) as a result of the Proposed Development will be based on the qualitative assessment of non-motorised users (NMU) amenity.
- 9.58. DMRB LA 112 provides sensitivity criteria for each of the elements as well as the magnitude of impact based on the changes resulting from the proposals. The resulting significance of the effect will be then derived by combining the assigned sensitivity value with the magnitude of change using the significance matrix (Table 9.1 above) as set out in DMRB LA 104.
- 9.59. Land use and accessibility effects will be assessed for all scenarios outlined above and consider both construction and operational phases (where applicable) of the Proposed Development.

Human health

- 9.60. The environmental conditions relevant to human health are set out in DMRB LA 112 as follows:
- air quality;
 - noise;
 - pollution;
 - landscape.
- 9.61. As stated earlier, the above conditions will be considered separately in the relevant chapters of the ES. Therefore, the only effect affecting human health considered as part of the land transport, accessibility and movement chapter will be the impact on severance/accessibility as outlined above, taking into consideration access to open green space/recreational facilities, opportunities for WCH and access to healthcare facilities. Also considered as part of the assessment will be personal injury accidents (PIA), specifically those involving NMU.
- 9.62. DMRB LA 112 suggests that the sensitivity of a community/population should be reported as low, medium or high based on the qualitative assessment. The outcome will then be identified as:
- Positive – a beneficial health impact;
 - Neutral – no discernible impact;

- Negative – an adverse health impact;
- Uncertain.

9.63. Similar to the land use and accessibility, human health (severance) will be assessed for all scenarios set out above and will be considered in both construction and operational phases (where applicable) of the Proposed Development.

Other

9.64. In addition to the DMRB, the guidance contained in IEMA Guidelines for the Environmental Assessment of Road Traffic provides advice specifically aimed at the effects of the transport and traffic. It defines the effects that should be regarded as a material consideration and then considers the weight to which those effects should be defined. The guidelines set out, inter alia, a list of environmental effects, which could be considered as potentially material or significant whenever a new development is likely to give rise to changes in traffic flows.

9.65. The IEMA list includes severance, NMU amenity, accidents/safety and driver delay, which is the only effect not considered by DMRB. However, and as acknowledged in the IEMA guidelines, the delays are only likely to be significant when the traffic in the network is already at, or close to, the capacity of the system.

9.66. An assessment of the local highway network and its capacity at the key junctions and links carried out as part of the TA is considered to be sufficient as it will identify locations where the network may reach its capacity. The TA will also develop appropriate mitigation strategies (where needed) to minimise the impacts of the proposals. As such, it is considered appropriate to exclude driver delay from the assessment undertaken as part of the Transport, Accessibility and Movement Chapter.

Construction traffic

9.67. Construction traffic is a temporary transport effect and will be significantly lower than development-related traffic. Thus, the effects tend to be less significant. The volume of traffic will also depend heavily on the rate of delivery and the triggers for the relevant phases of development. As set out within the 2014 scoping chapter, it is anticipated that the majority of construction materials will be delivered by river arriving at the Port of Tilbury, where it will be delivered to the Proposed Development by river. Temporary construction worker accommodation will also be provided for construction workers during the construction of the Resort, which will reduce construction traffic.

9.68. As the preferred main contractor will not be identified until later in the planning process, various assumptions will be made in a Draft Construction Logistics Plan that will be submitted with the DCO application. It is envisaged that the submission and approval of the detailed Construction Logistics Plan will be subject to a DCO Requirement. Once the main contractor is identified, the Construction Logistics Plan will be finalised and, within a Statement of Conformity, LRCH will review material changes that might occur.

PROPOSED AVOIDANCE AND MITIGATION MEASURES

- 9.69. The assessment of environmental effects in line with the EIA Regulations tends to require the mitigation to be considered separately; i.e. the effect is considered and assessed, and then the effect with mitigation is assessed. As transport volumes may be affected by the capacity of the transport network, this is not always practical.
- 9.70. The IEMA guidelines suggest that associated ‘...mitigation measures should be considered as a complete package’. However, for the purposes of the current assessment any mitigation will be considered in two parts - those infrastructure improvements that are considered necessary to meet the capacity needs of the development (and therefore, considered as part of the TA) and those additional (environmental) mitigation measures that do not require physical infrastructure and meet the collective needs of the development.
- 9.71. These additional environmental mitigation measures will form part of the assessment and will inform the residual development effects once traffic and other data become available. The mitigation measures would likely include a Construction Logistics Plan (CLP), Delivery and Servicing Plan (DSP), Public Transport Strategy (PTS), a Travel Plan (TP), new and/or improved NMU routes including crossing points and traffic management measures intended to preserve or enhance the amenity of road users. These will be enforced through DCO Requirements as appropriate.
- 9.72. By adopting this approach, the determination of the ‘cumulative’ assessment will be agreed with the relevant key stakeholders as part of the Transport Assessment scoping based on the LTC model.
- 9.73. Consequently, the cumulative effects of network traffic growth and some developments identified in Local Plans in the defined study area would typically be considered in the LTC model, such that the forecast baseline conditions will reflect some cumulative effect conditions.
- 9.74. Notwithstanding the Planning Authorities’ Strategic Environmental Assessments of emerging local plans, where developments rely on the delivery of transport infrastructure that is not designed to an advanced stage such that the mitigation of that development cannot be relied upon, it might be that such development(s) and infrastructure cannot be considered as part of this assessment and will be reviewed at a later date.

UNCERTAINTIES

- 9.75. A significant change from the scoping report in 2014 is the introduction of a car parking arrangement for the London Resort at the Port of Tilbury, reducing the potential vehicle

impacts upon the Dartford Crossing and A2(T) corridor, areas identified as constrained during the previous consultation period. At this time, the highway impacts of the proposals north of the river are unknown and will need to be assessed within the Transport Assessment and where necessary included within the ES Transport Chapter.

- 9.76. The timeframe in progressing the Proposed Development has also seen a change to the Traffic Model and the study area contained within the model. This will need to be considered further to understand the implications upon the assessment of effects.
- 9.77. The visitor profiles for the Proposed Development vary across the year, dependent upon a number of factors. It is impractical to assess all variations of the day types at the resort and therefore a significantly robust position has been put forward to assess an 85-percentile day. This constitutes a peak weekday which generally occurs during the summer holidays with the vast majority of days being significantly lower.

MATTERS TO BE SCOPED OUT

- 9.78. Potential effects of the Proposed Development on air transport are to be scoped out from the assessment. It is not expected that the proposals would have any effect on the current air travel patterns, and subsequently on the environment in general. However, should there be any effect resulting from additional travel, it is considered that this would be indirect and likely be subject to the environmental assessments undertaken by air infrastructure operators.
- 9.79. It is acknowledged and will be encouraged that Resort visitors and employees will use rail as a mode of choice to travel to and from the Proposed Development. However, the proposals would utilise the existing rail network and services. As such, no significant changes are expected, and rail transport is to be scoped out of the assessment.
- 9.80. Sea-related (as opposed to river-related) water traffic is to be scoped out from the assessment. Similar to air travel, it is expected that the proposals would have negligible effect on current sea lines. Whilst not assessed in any detail within the Transport Chapter, the potential for sea lines to be a form of travel for the Proposed Development will be discussed.

RIVER TRANSPORT

- 9.81. The Proposed Development will introduce a number of new river ferry services, including services from central London and cross-river services from the Park and Ferry facility at Tilbury. We have set out the required assessment within this scoping chapter. However, river transport will have a separate chapter in the ES that accompanies the DCO application for the London Resort project.
- 9.82. The following navigational features will need to be considered as part of the assessment:

- a new pier for river taxi vessels
- new mooring and berthing for roll-on roll-off (Ro-Ro) vessels
- new mooring and berthing for barges

9.83. The project also involves the following operations on the river:

- river clipper services from central London
- river clipper service between Tilbury and the Resort
- construction materials transfer between Tilbury and the Resort
- construction materials delivery
- deliveries during operation

9.84. All UK Statutory Harbour Authorities (SHAs) have a responsibility to comply with, inter alia, the letter and spirit of the Port Marine Safety Code (PMSC).

9.85. A core requirement of the PMSC is that the Duty Holder of the SHA must:

- Assess, and keep under review, the marine risks within the waters for which the SHA is responsible
- Develop policies and procedures to manage those risks and to employ, resource, and empower suitably competent personnel to manage marine operations and reduce risk
- Undertake the above by means of a structured Safety Management System (SMS), which has clear objectives, clear outcomes, and has the concept of continuous improvement embedded within it

9.86. A Navigational Risk Assessment (NRA) is therefore required to be submitted to the statutory harbour authority in whose water the candidate shipping will navigate – the Port of London Authority (PLA).

Initial assessment of potential impacts

9.87. Potential impacts on navigation could occur during the construction period. This will be discussed further with PLA. Without prejudice to the outcome of the NRA, the following are the types of hazard which are anticipated will be assessed during this NRA. The list is not intended to be exhaustive, and Hazard Identification meetings may well identify other hazards.

- vessels colliding
- vessel losing power or steerage
- vessel striking berth
- vessel breaking away from its moorings
- vessel being struck whilst moored

9.88. As part of the assessment, consideration will be given to the need for mitigation in the form of aids to mitigation whether during construction or operation. This will fully

discussed and agreed with the PLA.

- 9.89. The proposals will not affect the operation of the existing Tilbury to Gravesend Ferry as neither the physical infrastructure or vessel movements for the London Resort will infringe on the route of the ferry.

Approach and methodology

- 9.90. In order to assess the impact of the development on navigation risk the NRA will be based on guidance published by the International Maritime Organization in MSC/Circ.1180-MEPC/Circ.474 and MSCMEPC.2/Circ.5. The approach will follow the PLA's preferred methodology for a NRA taken from

<http://www.pla.co.uk/Safety/Navigational-Risk-Assessment-Guidance-to-Operators-and-Owners>

Chapter 10 ◆ Landscape and visual effects

INTRODUCTION

- 10.1 This chapter explains the general approach that will be taken to the assessment of landscape and visual effects and describes how the findings will be reported in the ES.
- 10.2 Landscape and visual effects are independent but related issues. Landscape effects relate to changes to the landscape fabric and the features contributing to the landscape character and quality. Visual effects relate to the appearance of such changes within views and the resulting effect on visual amenity.
- 10.3 The landscape and visual assessment has already commenced and has examined the current landscape and visual baseline conditions within the Project Site and its broader context with reference to sensitive visual receptors and landscape designations. The assessment process will involve an ongoing analysis of the likely landscape and visual effects of the evolving development proposals and, where impacts cannot be avoided through design, will recommend additional mitigation measures.

RELEVANT LAW, POLICY AND GUIDANCE

Legislative and Policy Context

European Landscape Convention 2007

- 10.4 The European Landscape Convention (ELC), which was signed by the UK in February 2006 and became binding in 2007, is the first international convention to focus specifically on landscape issues and aims to protect and manage landscapes in Europe and to plan positively for change within them. The ELC highlights the importance of developing landscape policies dedicated to the protection, management and creation of landscapes, and establishing procedures for the general public and other stakeholders to participate in policy creation and implementation.
- 10.5 The ELC defines landscape as *'an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors'* (Council of Europe, 2004).

Hedgerow Regulations 1997

- 10.6 The Hedgerow Regulations (UK Parliament, 1997) aim to protect hedgerows, which play an important role in supporting and enhancing biodiversity, as well as defining the character of the English and Welsh countryside.

- 10.7 According to the regulations, a hedgerow is important if it has existed for 30 years or more, and it satisfies various wildlife, landscape or historical criteria specified in the regulations.

Policy Framework

National Policy Statements

- 10.8 National Policy Statements set out the need for and government's policies to deliver Nationally Significant Infrastructure Projects (NSIPs) in England. Chapter three of this scoping report explains that there is no NPS for business and commercial NSIP projects. However, to the extent that the Project includes transport and highways infrastructure, regard will be had to relevant policy in the NPS for National Networks, including:

- Environmental and social impacts (NPS paragraphs 3.2 to 3.5);
- Criteria for “good design” for national network infrastructure (NPS paragraphs 4.28 – 4.35);
- Climate change adaptation (NPS paragraphs 4.36 – 4.47);
- Landscape and visual impacts (NPS paragraphs 5.143 – 5.161);
- Land use including open space, green infrastructure and Green Belt (NPS paragraphs 5.162 – 5.185).

National Planning Policy Framework 2019 (NPPF)

- 10.9 At the heart of the NPPF is a presumption in favour of sustainable development, this being the key principle running throughout the document and the development of NPPF policies. Considering this broad aim alongside the three dimensions of sustainable development, in particular that relating to environmental matters, the role of landscape and visual impact assessment (LVIA) is key in the creation of successful places in which to live and work.
- 10.10 For landscape, this means recognising the intrinsic beauty of the countryside (NPPF paragraph 170) and balancing any ‘harm’ to the landscape resource with the benefits of the scheme in other respects.
- 10.11 With regards to statutory landscape designations, paragraph 172 states that:

‘Great weight should be given to conserving and enhancing landscape and scenic beauty in National Parks, the Broads and Areas of Outstanding Natural Beauty, which have the highest status of protection in relation to these issues’ and the ‘scale and extent of development within these designated areas should be limited. Planning permission should be refused for major development other than in exceptional circumstances, and where it

can be demonstrated that the development is in the public interest’.

10.12 No part of the DCO boundary falls within or adjacent to the above specified statutory landscape designations.

10.13 In consideration of landscape and visual impacts of light pollution, paragraph 180 bullet point c) states that new development should *‘limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation’.*

Local plan policy

10.14 As explained earlier in this report, the Site falls within three Local Planning Authority (LPA) areas - Dartford and Gravesham Boroughs in Kent and Thurrock, a unitary authority on the Essex side of the river. The relevant adopted local statutory planning documents include:

- Dartford Borough Core Strategy (adopted 2011);
- Dartford Borough Development Policies Plan (adopted 2017);
- Gravesham Borough Local Plan Core Strategy (adopted 2014);
- Saved policies (saved in 2007) from the Gravesham Borough Local Plan First Review (adopted 1994);
- Thurrock Borough Core Strategy and Policies for Managing Development (adopted 2015); and
- Saved policies (saved in 2012) from Thurrock Borough Local Plan (adopted 1997).

10.15 A review of the above documents has identified the following planning policy issues of relevance to consideration of landscape and visual matters:

Dartford Borough Core Strategy (Adopted 2011)

10.16 Policies in the Dartford Borough Core Strategy (adopted 2011) of relevance to the DCO and landscape and visual amenity include the following:

- Policy CS4 – Ebbsfleet to Stone Priority Area;
- Policy CS5 – Ebbsfleet Valley Strategic Site;
- Policy CS6 – Thames Waterfront Priority Area;
- Policy CS14 – Green Belt.

Dartford Borough Development Policies Plan (Adopted 2017)

10.17 Policies in the Dartford Borough Development Policies Plan (Adopted 2017) of relevance to landscape and visual amenity include the following:

- Policy DP22 – Green Belt in the Borough;
- Policy DP25 – Nature Conservation and Enhancement.

Gravesham Borough Local Plan Core Strategy (Adopted 2014)

10.18 Policies in the Gravesham Borough Core Strategy (Adopted 2011) of relevance to the DCO and landscape and visual amenity include the following:

- Policy CS01 – Sustainable Development;
- Policy CS02 – Scale and Distribution of Development;
- Policy CS03 – Northfleet Embankment and Swanscombe Peninsula Opportunity Area;
- Policy CS06 – Ebbsfleet (Gravesham) Opportunity Area;
- Policy CS12 – Green Infrastructure;
- Policy CS19 – Development and Design Principles;

Thurrock Borough Core Strategy and Policies for Managing Development (Adopted 2015)

10.19 Policies in the Thurrock Borough Council Core Strategy and Policies for Managing Development (adopted 2015) of relevance to landscape and visual amenity include the following:

- Policy CSTP18 – Green Infrastructure;
- Policy CSTP23 – Thurrock Character and Distinctiveness;
- Policy CSTP28 – River Thames;
- Policy PMD2 – Design and Layout.

Saved policies (2012) from Thurrock Borough Council Local Plan (Adopted 1997)

10.20 There are no saved policies of relevance to landscape and visual amenity in this document.

THE 2014 SCOPING OPINION

10.21 As noted earlier in this report, a previous Scoping Opinion was received in relation to the Project Site in December 2014. EDP has noted the previous comments in relation to the landscape and visual scope and seeks to address the Secretary of State's advice and recommendations in the updated scope described below.

Table 10.1: Planning Inspectorate's comments from EIA Scoping Opinion in relation to Landscape (December 2014).

Paragraph	Inspectorate's comments	Action taken
3.17	The landscape and visual assessment in the scoping report refers to the Zone of Theoretical Visibility (ZTV). The Secretary of State advises that the ES should describe the model used, provide information on the area covered and the timing of any survey work and the methodology used.	The ZTV model is discussed below and will be covered in more detail within the Landscape and Visual Baseline report, of which timings, coverage and is specified. Photography has and will continue to be undertaken in line with the latest Landscape Institute <i>Visual Representation of Development Proposals</i> (Technical Guidance Note 06/19).
3.17	The Secretary of State recommends that the location of viewpoints and photomontages should be agreed with the local authorities and welcomes the intention in the Scoping Report to do so.	The intention remains to agree a fresh set of viewpoint, photomontage and night photoviewpoint locations with the local authorities.
3.17	The comments received from KCC and DBC provided in Appendix 2 of this Opinion should be considered when establishing the baseline to be used in the assessment and the approach to the assessment in particular with respect to landscape character. DBC have also provided guidance on viewpoints to be included, as have KCC and GBC (in Appendix 2).	Consideration will be given to all published landscape character baseline information across all local authority areas. EDP intends to re-agree the scope of photoviewpoint selection with each authority and KCC due to changes in baseline circumstances over the past six years.
3.18	The Secretary of State notes and welcomes the intention to include views from across the Thames in the assessment, and to assess the impact of lighting and nocturnal visual effects during construction and operation.	Views from across the Thames are still intended for inclusion and assessment.
3.18	The applicant should consider any measures as may be required by the Civil Aviation Authority (CAA) with respect to cranes and aviation safety	Consideration will be given to any lighting needed for crane operations required by the CAA

Paragraph	Inspectorate's comments	Action taken
	(see Appendix 2 for the CAA response) within the assessment of lighting impacts.	within the assessment.
3.19	The Secretary of State notes that the southern part of the indicative DCO boundary shown in the Scoping Report lies within Green Belt. The landscape and visual impact assessment will need to take account of the potential impact of the development to the Green Belt, including assessment of the impact to the openness of the Green Belt, with particular reference to the National Planning Policy Framework. In this regard it will also be appropriate to consider alternatives, in order to justify any requirement for highway improvements proposed within the Green Belt.	The landscape and visual impact assessment will take into account the potential impact to the openness and permanence of Green Belt. Predicted effects are considered at the end of this scoping report.
3.20	The Secretary of State encourages the applicant to agree the scope of the cumulative impact assessment with consultees, and notes the overarching approach to cumulative assessment outlined in the Scoping Report.	EDP will seek to agree scope of cumulative impacts with regards to landscape and visual amenity with consultees.
3.21	<p>The proposals will be for large buildings and other structures, as well as the creation of built areas on a currently un-built open site. The Secretary of State requests that careful consideration should be given to the form, siting, and use of materials and colours in terms of minimising the adverse visual impact of these structures and maximising potential beneficial visual aspects. The Secretary of State notes the comments in Table 5.6 and Table 5.7 of the Scoping Report regarding the use of high quality architectural engineering and landscape design, and encourages the use of these techniques to create a development that integrates with the environment and provides opportunity for enhancement of views.</p> <p>Design elements such as green roofs and walls may provide opportunities in this regard. HS1 have also provided comment (Appendix 2) related to this consideration.</p>	Consideration of such matters will be employed throughout the EIA process as is best practice.
3.22	The proposals will also include changes to the existing landform in places, indicated in particular in Chapter 7 of the Scoping Report.	EDP will closely liaise with other environmental disciplines throughout the EIA process as is

Paragraph	Inspectorate's comments	Action taken
	The Secretary of State advises that it will be important to show how the EIA has considered these aspects with respect to landscape and visual impacts. There is likely to be need for coherence with the water management, soils and ground conditions, cultural heritage, and ecology topic areas, a point also made by KCC in Appendix 2. The ES should consider the need for an integrated Landscape and Ecology Master Plan in this regard.	best practice.
3.23	It will be essential for the project, including any mitigation works proposed, to take the presence of existing infrastructure into account within its design, and the applicant is referred to comments in Appendix 2 from HS1 with respect to existing assets, National Grid (NG) with respect to safety and access, and from the PLA with regards to navigation for river traffic, including making provision for existing equipment, sightlines across the peninsular and potential effects from lighting of the development.	Consideration of such matters will be employed throughout the EIA process as is best practice.

CONSULTATION FEEDBACK

10.22 Consultation has begun with Dartford Borough Council, Gravesham Borough Council, Thurrock Borough Council and Kent County Council in order to agree the photoviewpoint selection and methodology.

10.23 Previous relevant responses received for the 2014 Scoping Opinion include:

Table 10.2: Excerpts of consultation responses in relation to Landscape and Visual in the 2014 Scoping Opinion from the Planning Inspectorate.

Consultee	Response
Natural England	Natural England would wish to see details of local landscape character areas mapped at a scale appropriate to the development site as well as any relevant management plans or strategies pertaining to the area. The EIA should include assessments of visual effects on the surrounding area and landscape together with any physical effects of the development, such as changes in topography. The European Landscape Convention places a duty on decision makers to consider the impacts of landscape when exercising their functions.

Consultee	Response
	<p>The EIA should include a full assessment of the potential impacts of the development on local landscape character using landscape assessment methodologies. We encourage the use of Landscape Character Assessment (LCA), based on the good practice guidelines produced jointly by the Landscape Institute and Institute of Environmental Assessment in 2013. LCA provides a sound basis for guiding, informing and understanding the ability of any location to accommodate change and to make positive proposals for conserving, enhancing or regenerating character, as detailed proposals are developed.</p> <p>Natural England supports the publication Guidelines for Landscape and Visual Impact Assessment, produced by the Landscape Institute and the Institute of Environmental Assessment and Management in 2013 (3rd edition). The methodology set out is almost universally used for landscape and visual impact assessment.</p> <p>In order to foster high quality development that respects, maintains, or enhances, local landscape character and distinctiveness, Natural England encourages all new development to consider the character and distinctiveness of the area, with the siting and design of the proposed development reflecting local design characteristics and, wherever possible, using local materials. The Environmental Impact Assessment process should detail the measures to be taken to ensure the building design will be of a high standard, as well as detail of layout alternatives together with justification of the selected option in terms of landscape impact and benefit.</p> <p>The assessment should also include the cumulative effect of the development with other relevant existing or proposed developments in the area. In this context Natural England advises that the cumulative impact assessment should include other proposals currently at Scoping stage. Due to the overlapping timescale of their progress through the planning system, cumulative impact of the proposed development with those proposals currently at Scoping stage would be likely to be a material consideration at the time of determination of the planning application.</p> <p>The assessment should refer to the relevant National Character Areas which can be found on our website. Links for Landscape Character Assessment at a local level are also available on the same page.</p>
Natural England	<p>Natural England encourages any proposal to incorporate measures to help encourage people to access the countryside for quiet enjoyment where these are compatible with other designations. Measures such as reinstating existing footpaths together with the creation of new footpaths and bridleways are to be encouraged. Links to other green networks and, where appropriate, urban fringe areas should also be explored to help promote</p>

Consultee	Response
	<p>the creation of wider green infrastructure. Relevant aspects of local green infrastructure strategies should be incorporated where appropriate.</p> <p>The EIA should consider potential impacts to (and opportunities to enhance) open access land, public open land, rights of way and the proposed coastal access route (as part of the England Coast Path) in the vicinity of the development. We also recommend reference is made to the relevant Right of Way Improvement Plans (ROWIP) to identify public rights of way within or adjacent to the proposed site that should be maintained or enhanced.</p>
HS1	<p>HS1 emerges from the Thames Tunnel at Swanscombe and continues on the surface through the Ebbsfleet Valley. The development should ensure that the overall passenger experience should be enhanced, with existing views protected and new aspects presented.</p> <p>The development also impacts on the HS1 mitigation planting and landscape.</p> <p>The assessment should consider:</p> <ul style="list-style-type: none"> • The view from the train, the development should consider the impact on the quality of the journey by international and national rail passengers (this could also be an important element in the promotion of the resort); • The setting of Ebbsfleet Station which has a prominent location in the Ebbsfleet Valley now and within a future new development area and as such helps promote rail travel; • Passengers arriving by car and bus to the station; and • Impact on HS1 landscape planting, seeding and landscape.
Marine Management Organisation	Seascape should be included within this section or in a standalone marine chapter.
Kent County Council	I welcome the inclusion of the historic landscape dimension in the Landscape and visual effects chapter. Landscape features created by former and current industrial activities such as the dramatic landforms left by quarrying or the landmarks relating to cement production and power generation (such as the 'superpylon' on the northern edge of the peninsula) contribute greatly to the landscape character of the area and form lasting reminders of a period in history where Britain probably had its greatest impact on a world scale. Assessment of the industrial heritage of the area should not be reduced to categorising the area as a wasteland or of

Consultee	Response
	<p>automatic low environmental quality but should objectively assess the cultural and social aspects of the landscape rather than assuming that the immediate pre-industrial landscape had any higher value than any of the other now invisible landscapes which were once present within the development site.</p> <p>The Thames Gateway Historic Environment Characterisation project is listed as a baseline study but this study is inadequate in its assessment of archaeological character and is also now very out of date. It should not be used to inform any assessment of archaeological character for the site or wider area.</p> <p>The Kent Historic Landscape Character assessment should be included in the baseline studies but more detailed historic landscape character assessment should be carried out for the site level of description and assessment as the Kent study is intended to be very broad brush. Useful information may also be found in the recent Kent Farmsteads Guidance baseline study.</p> <p>Swanscombe Heritage Park and SS Peter and Paul, Swanscombe should be taken forward as viewpoints. The Heritage Park should also be considered as a heritage site rather than just as a public open space. The contemporary landscape would have been radically different to the present day but views to the River Thames and Ebbsfleet Valley from adjacent high ground are important aspects to understanding its former landscape setting. The Palaeolithic sites such as the Bakers Hole scheduled monument, in the Ebbsfleet Valley should also be assessed in terms of landscape legibility.</p>
<p>Kent County Council</p>	<p>For an application of this scale and national significance, the Landscape & Visual Impact Assessment (LVIA) and the iterative consideration of landscape through the scheme’s design should be of the very highest quality.</p> <p>The comments given below and in the attached table are based upon published landscape references, the LVIA Guidelines (2013) and the National Planning Policy Framework (NPPF) guidance as well as best practice in understanding and applying landscape knowledge through the planning system from the professional body, the Landscape Institute.</p> <p>In line with the NPPF an integrated approach to all development is sought. The European Landscape Convention (ELC) definition of landscape aligns with the NPPF (9) pursuit of Sustainable Development “... seeking positive improvements in the quality of the built, natural and historic environment as well as people’s quality of life.” The built, natural and historic environment together, produces the character of our landscapes.</p>

Consultee	Response
	<p>Landscape should be considered alongside ecology, heritage etc., it is a framework, the result of how people and these elements have interacted over time. Considering landscape separately risks missing the identification of impacts, and is against the intention of the EIA process. Cross references should be made between the disciplines. GLVIA (Para 3.17) “The EIA co-ordinator will usually play an important part in facilitating such integration across the topic areas.”</p> <p>Given the complexity and national significance of the proposal the scoping document should utilise the professional guidance available. The GLVIA provides this and it is the role of the landscape professional to determine the elements of the Guidance required for their proposal and to explain how these elements will be applied. It is expected that the majority of this guidance will be needed and should be followed and its intention understood and reflected. In our view the identified ‘key matters’ for scoping included in the GLVIA are imperative to the scoping element of this scheme.</p> <p>The terms used in LVIA have a specific and clearly defined meaning. The LVIA is designed to be a rigorous, repeatable methodology, for a topic that has a high degree of subjectivity. Some terms appear to have been misinterpreted in the Scoping Report.</p> <p>The applicant has acknowledged the ELC, but its principles have not been applied in the Scoping Report. For example: the broad definition of landscape is quoted, yet the Baseline research proposed is narrow and minimal, without referencing the breadth of information needed to understand a landscape. The ELC and indeed all of these references should be applied based upon their intention and not just re-iterated.</p> <p>The ELC applies to degraded, as well as protected landscapes, therefore this LVIA should be as robust as one for a proposal within an AONB or National Park.</p> <p>It is recommended that, given the ELC and LCA definitions of landscape and landscape character respectively, that the applicant adhere to these and whilst taking the broadest meaning of landscape, consider other paragraphs of the NPPF. Including (but not limited to):</p> <ul style="list-style-type: none"> • Core principles. These reference character and function, both relevant to and referenced in best practise guidance for LVIA. • The whole thread of sustainable development runs through the NPPF – therefore we will be seeking environmental gains, along with gains for society and the economy. Landscape should provide the

Consultee	Response
	<p>framework within which these gains fit.</p> <p>KCC are keen to meet with the applicant and their landscape advisers to provide advice on the type and degree of expectations we would have for the LVIA and landscape.</p>
<p>Gravesham Borough Council</p>	<p><i>Green Belt Impacts</i></p> <p>Part of the application site enclosed by the red line boundary lies within the Metropolitan Green Belt to the south of the A2 Watling Street trunk road and A296 Roman Road in Dartford. Whilst it is understood that the inclusion of this area is intended to facilitate the highway improvements at the Bean and Ebbsfleet junctions necessary to service the development, it needs to be recognised that any other works or other built development would not be precluded within this area under any DCO.</p> <p>It should also be noted that any proposals for development within the Green Belt (whether comprising highway works or not) would be subject to national policy that seeks to preserve openness and potential harm by reason of inappropriateness or other harm.</p> <p>Paragraph 90 of the National Planning Policy Framework (NPPF, 2012) states that engineering operations or local transport infrastructure which can demonstrate a requirement for a Green Belt location may not be inappropriate where it preserves openness and does not conflict with the purposes of including land in it, but it is difficult to see how this would apply given the scale and form of the junction improvements set out in the most recent public consultation but not included in the EIA Scoping Report.</p> <p>Whilst Green Belt represents a policy rather than an environmental constraint, aspects remain relevant to the EIA scoping because of potential harm to other interests of acknowledged importance – such as adverse landscape impacts, loss of best or most versatile agricultural land (Grade 2), and cultural heritage in terms of impact on the Springhead Roman Town Scheduled Monument and the contribution made to its significance by its setting at the head of the Ebbsfleet Valley.</p> <p>It is difficult under these circumstance to see how the ES could ignore the Green Belt constraint given the above could constitute ‘other harm’ that would be material in determining whether ‘very special circumstances’ exist to justify setting aside policy. It would be appropriate therefore for the ES to consider alternatives to the indicative junction design set out in the public consultation that seek to mitigate impact on the Green Belt and other associated harm. Such mitigation might include placing some of the key links in tunnel rather than on bridge links to reduce visual/Green Belt impact (particularly that linking the new dual carriageway with the London</p>

Consultee	Response
	westbound slip south of the A2) provided this can be designed and constructed in such a way that any potential impact on archaeological deposits is deemed to be acceptable.
Gravesham Borough Council	<p data-bbox="454 412 837 443"><i>Landscape and Visual Impact</i></p> <p data-bbox="454 488 1439 636">In respect of the assessment of landscape and visual effects the report indicates that the methodology will be based on the recommendations of Guidelines for Landscape and Visual Impact Assessment produced by the Landscape Institute.</p> <p data-bbox="454 680 603 712"><i>Viewpoints</i></p> <p data-bbox="454 757 1439 1061">It stated that proposed viewpoints are to be agreed with the respective local authorities – 8 are identified in Gravesham (Gravesend to Tilbury ferry; Swanscombe peninsula footpath; the Factory Club; Northfleet lighthouse; the Hill conservation area; Ebbsfleet Valley; Gravesend Riverfront and Kings Farm) although it is considered that there may well be other viewpoints that are equally important including Carl Ekman House, Tooley Street, Northfleet (Residential Users); Wallis Park, Northfleet (Residential Users); and Windmill Hill, Gravesend (Conservation Area).</p> <p data-bbox="454 1106 1029 1137"><i>Need for Details of Scale, Form and Massing</i></p> <p data-bbox="454 1182 1439 1568">The scoping report lists the aspects of the development that are likely to have landscape and visual effects in paragraph 5.50. However, whilst the heights of a range of the developments within the core resort area are indicated including buildings at plus 32m in height, structures (mountains) of 50-60m in height, rides and roller coasters at plus 40m in height and hotels at plus 40m it is difficult to see how these can be properly assessed without an indicative master plan providing details of scale, form and massing in particular locations given there will be groups of buildings that have the potential to be seen from different places or obstruct views of the river etc.</p> <p data-bbox="454 1612 1439 1917">It is also noted that at paragraph 5.52 of the scoping report it is intended that the cumulative effect of development will be taken into account, having regard to the wider context of the Ebbsfleet Valley development. However, it is not made clear what assumptions will be made in relation to the form this development will take given that London Paramount is likely to result in changes to any existing master plan layout and it is unclear whether the development as permitted is deliverable given the market for offices at the current time.</p> <p data-bbox="454 1962 1439 2029">The visual impact of the development will also depend on the architectural quality of the development that is brought forward and its detailed design.</p>

Consultee	Response
	<p>Whilst form is likely to follow function to a large extent in the case of a theme park development, it is important given the Swanscombe Peninsula location that design excellence is achieved and that the built form is iconic. The EIA Scoping Report should indicate the mechanisms by which this will be achieved – i.e. international design competition/peer review by a panel of independent architectural experts/prior approval of the local planning authority (presumably the Ebbsfleet Development Corporation by that stage).</p> <p><i>Lighting Impacts</i></p> <p>Although the landscape and visual effects chapter heading in the scoping report indicates that this will include lighting and nocturnal effects there is no reference in the report to the assessment of the effect of the lighting of this development both in terms of light sensitive premises and glow in the sky.</p>
<p>Dartford Borough Council</p>	<p><i>Detailed points</i></p> <ul style="list-style-type: none"> • Paragraph 5.18: The baseline assessment of the area south of the River Thames advises that skylines are dominated by pylons and overhead transmission lines but fails to note that a strong characteristic of this urban area is that there are many ridgelines, both natural and manmade, and almost all of these are characterised by trees on the ridges. Such that the long distance views and the backdrops to the urban area is characterised by trees on ridgelines. • Paragraph 5.21: The Thames Gateway Historic Environment Characterisation project is listed as a baseline study but this study is inadequate in its assessment of archaeological character and is also now very out of date. It should not be used to inform any assessment of archaeological character for the site or wider area. • Table 5.3 (the potential assessment viewpoints). The visual receptors for numbers 14 & 15 are transposed. Ingress Abbey is the Listed Building (in residential use) and Ingress Park is the recent residential development. Number 20, All Saints Church, is a Listed building but has been deconsecrated and converted to apartments. <p><i>General comments on the proposed methodology</i></p> <p>The inclusion of the historic landscape dimension in the Landscape and Visual effects chapter is welcomed as the landscape features created by former and current industrial activities such as the dramatic landforms left by quarrying or the landmarks relating to cement production and power</p>

Consultee	Response
	<p>generation (such as the ‘superpylon’ on the northern edge of the peninsula) contribute greatly to the landscape character of the area and form lasting reminders of a period in history where Britain probably had its greatest impact on a world scale. However, the Council is concerned to ensure that the assessment of the industrial heritage of the area should not be reduced to categorising the area as a wasteland or of automatic low environmental quality. Instead it should objectively assess the cultural and social aspects of the landscape rather than assuming that the immediate pre-industrial landscape has a higher value than any of the other now largely invisible industrial landscapes which were once present within the development site.</p> <p>The Kent Historic Landscape Character assessment should be included in the baseline studies but more detailed historic landscape character assessment should be carried out for the site level of description and assessment as the Kent study is intended to be very broad brush. Useful information may also be found in the recent Kent Farmsteads Guidance baseline study.</p> <p>Swanscombe Heritage Park and St Peter and Paul Church, Swanscombe should be taken forward as viewpoints. The Heritage Park should also be considered as a heritage site rather than just as a public open space. The contemporary landscape would have been radically different to the present day but views to the River Thames and Ebbsfleet Valley from adjacent high ground are important aspects to understanding its former landscape setting. The Palaeolithic sites such as the Bakers Hole scheduled monument, in the Ebbsfleet Valley should also be assessed in terms of landscape legibility.</p> <p><i>Mitigation</i></p> <p>In due course, the Council will be keen to understand further how the high quality architectural, engineering and landscape design can be delivered through the DCO where this detail is not available at the time of the consideration of the proposal</p>

BASELINE CONDITIONS AND MAIN ISSUES

Landscape designations and other relevant considerations

10.24 A summary of relevant designations is provided below and illustrated in figures 10.1 and 10.2 (edp5988_d005a and edp5988_d034a). EDP is working in consultation with other environmental disciplines, in particular ecology and cultural heritage, to ensure a collaborative approach to the design and assessment process. In summary:

- There is one statutory landscape designation within the 6km search area. The Kent Downs Area of Outstanding Natural Beauty (AONB) lies approximately 5.1km south-east of the site;
- No non-statutory landscape designations exist within the 6km search area;
- The southern area of the Kent Project Site, south of the A2 main road, is in the metropolitan green belt;
- A number of public rights of way (PRoW) cross the Project Site;
- Four blocks of Ancient Woodland fall within the southern part of the site, two of which lie between the A2 Main Road and A296, whilst the westernmost extent of the DCO boundary overlaps with two small sections of Darenth Wood;

Landscape character

National Character Areas

10.25 At a national level the site lies in a transitional zone between Natural England's (NE) National Character Areas (NCA). The Swanscombe peninsula area of the Kent Project Site and Tilbury Dock part of the Essex Project Site are located within NCA 81¹ 'Greater Thames Estuary'. The southern parts of the Kent Project Site including the existing quarries, land around Ebbsfleet International and the A2 road corridor are located in NCA 113², 'North Kent Plain'. Just north of the northern bank of the River Thames and the Essex Project Site lies NCA 111³, the 'Northern Thames Basin', whilst to the south of the Kent Project Site lies NCA 119⁴, 'North Downs' which is broadly associated with the higher, wooded ground of the Kent Downs AONB.

10.26 In terms of NCA descriptions and their key characteristics, whilst it may be considered that some are of relevance to the Project Site and nearby context, generally they provide too broad an analysis, covering large geographic areas, particularly as the Site lies in what could be considered a transitional area between four NCAs.

10.27 It is considered that the description of landscape character undertaken at the sub-regional level is more relevant in establishing the landscape resource baseline. Accordingly, while

¹ NCA Profile: 81 Greater Thames Estuary (Natural England, 2013)

<http://publications.naturalengland.org.uk/publication/4531632073605120>

² NCA Profile: 113 North Kent Plain (Natural England, 2012)

<http://publications.naturalengland.org.uk/publication/2900242>

³ NCA Profile: 111 Northern Thames Basin (Natural England, 2013) <http://publications.naturalengland.org.uk/publication/4721112340496384>

⁴ NCA Profile: 119 Northern Downs (Natural England, 2013)

<http://publications.naturalengland.org.uk/publication/7036466>

the above NCAs have been used to inform the baseline, they will not be carried forward to the detailed assessment of effects, with the focus instead being on county and borough landscape character areas. The following subsections identify the county and borough published landscape character areas within the near vicinity of the Project Site, whilst a more detailed narrative is included in the Landscape and Visual baseline Report (Appendix 10.1). Figure 10.3 illustrates the location of Landscape Character Areas (LCAs) in relation to the Project Site. It should be noted that where borough level information is not present, the next best available data are used, i.e. county level.

Kent Landscape Character Assessment (2004)

10.28 A review of the Kent Landscape Character Assessment (KLCA) finds that the Kent Project Site is located in four Landscape Character Areas (LCAs). The northern parts of the Kent Project Site (Swanscombe Peninsula) lie within the 'Western Thames Marshes' LCA, whilst the majority of the southern portions of the Kent Project Site are in the 'Dartford and Gravesend Fringes' LCA, with sections of the A2 road within the DCO boundary partially lying within the 'Darenth Downs' LCA and 'Southfleet Arable Lands' LCA.

Gravesham Landscape Character Assessment (2009)

10.29 The Gravesham Landscape Character Assessment (GLCA) finds that the Kent Project Site overlaps with two LCAs. The eastern part of the Kent Project Site on Swanscombe Peninsula is in the Botany Marshes LCA, whilst a small section of the A2 at the south-eastern extent of the Kent Project Site is located in the 'Southern Gravesend Fringes' LCA. Within the 2km detailed study area is also the 'Istead Arable Farmland' LCA which comes to within 80 metres of the southern boundary of the Kent Project Site.

Gravesham Townscape Appraisal (2008)

10.30 According to the Gravesham Townscape Appraisal (GTA), the Kent Project Site is partially within the 'Industrial Hinterland' Townscape Character Area (TCA). Elsewhere, the Kent Project Site also abuts the 'Northfleet' TCA and 'Modern Suburbs' TCA.

Thurrock Landscape Capacity Study (2005)

10.31 With regard to the Thurrock Landscape Capacity Study (TLCS), the Essex Project Site is determined as falling within the 'Tilbury and Docks Urban Area' LCA and 'Tilbury Marshes' LCA.

Thames Strategy East (2008)

10.32 A review of the Thames Strategy East (TSE), locates the Kent Project Site in the Reach Character Areas (RCA), the 'Long Reach and Fiddler's Reach' RCA and the 'Northfleet Hope' RCA. The Essex Project Site similarly falls within two RCAs, namely the 'Northfleet Hope' RCA and 'Gravesend Reach' RCA.

Landscape character of the Project Site Itself

10.33 The Kent Project Site and Essex Project Site are described in brief below, with a comprehensive description of these area and local landscape character described in the Landscape and Visual Baseline Report (Appendix 10.1).

Kent Project Site

10.34 The majority of the Kent Project Site on the Swanscombe Peninsula comprises a large area of open land in a low-lying riverside landscape beside the River Thames, between the Queen Elizabeth II Bridge and Gravesend.

10.35 The Peninsula has a long industrial history relating to the manufacture of cement and the majority of the area is a brownfield site comprising previously developed land, some of which is contaminated. Other parts of the Kent Project Site on the Swanscombe Peninsula that are characteristic of industrial uses include the existing Manor Way, Northfleet and Kent Kraft industrial estates.

10.36 The Swanscombe Peninsula is predominantly a medium to large scale landscape with a generally open, low-lying and windswept character, retaining extensive areas of marshland including Black Duck Marsh, Botany Marsh and Broadness Marsh. Broadness Marsh at the northern tip of the Peninsula was historically a saltmarsh, but now has a raised terrain as a result of Cement Kiln Dust CKD tipping and the deposition of river dredgings. A number of drains, filtration systems, aeration lagoons and other features are also present across the peninsular, whilst Broadness and Botany Marshes are bordered in part by industrial uses.

10.37 As such, the landscape fabric across the Swanscombe Peninsula is extremely varied and includes extensive areas of marsh and grassland, semi-mature woodland and scrub, grassed embankments which act as flood defences, and some industrial premises, with public access limited to a small number of public footpaths including Saxon Way, which runs along the western flood embankment. Much of the peninsula has re-vegetated naturally former industrial areas and spoil heaps, but areas of bare ground remain.

10.38 The Peninsula has an irregular topography because of historical CKD tipping activities and the deposition of dredgings from the River Thames. Notably, two raised areas of tipped material rise to over 12-13 metres above ordnance datum (AOD).

10.39 In terms of vertical elements, the skyline is dominated by overhead power lines and pylons in many views that cross the Peninsula on a south-east to north-westerly alignment, and include a 190 m tall 'super pylon' that lifts the transmission lines over the Thames to a similar tower on the northern bank. These lattice towers are the UK's tallest electricity pylons (and the third largest in Europe) and are prominent local landmarks.

10.40 Another notable feature on the Kent Project Site and the Swanscombe Peninsula is the HS1 railway, which crosses the Peninsula on a south-east to north-westerly alignment. The

southern section of the railway is in cutting and the remainder is in a tunnel. A pumping station that serves to lower ground water adjacent to the tunnel is located to the north-east of the tunnel portal.

- 10.41 Considering the Peninsular/River Thames interface of the Kent Project Site, the banks of the Peninsula feature occasional jetties and inlets, some of which are used for the mooring and landing of boats. An inlet at the northern end of the Peninsula, known as Broadness Creek, has a number of boat sheds varying in character and maintenance. A small number of public footpaths cross the Kent Project Site .
- 10.42 The Kent Project Site does not contain any international or national wildlife designations. Part of the Ebbsfleet Marshes Local Wildlife Site (LWS TQ 619738), which includes wet woodland and reed beds, is located in the Ebbsfleet Valley section of the Kent Project Site.
- 10.43 The Ebbsfleet Valley part of the Kent Project Site, south of the Swanscombe Peninsula, is an area that has been subject to major change in the last few centuries, primarily through industrial development and quarrying activities that have shaped its character and identity. The unusual landform comprises a number of ‘chalk spines’, left over from former quarrying and the land-fill uses, with the distinctive steep and high rising chalk cliffs an indication the scale of past quarrying operations.
- 10.44 Major infrastructure such as the A2(T), A2260, HS1 and the North Kent Line Railway cut across the valley landscape, providing visual and audible disruption. HS1 passes through Ebbsfleet International Station within the Kent Project Site and includes a number of extensive areas of hard-surfaced car parks, roads, landscaping and security fencing.

Essex Project Site

- 10.45 The Essex Project Site was found to be generally consistent with the character described in the ‘Tilbury and Docks Urban Area’ LCA of the Thurrock Landscape Character Assessment. The area is a low-lying and level landscape, similar to that of the Kent Project Site which isn’t surprising given the Thameside location. Large commercial warehouses, cranes, and dockland buildings front onto the Thames and are located throughout the area which dominate the skyline throughout the nearby area. Where the area has not been developed for warehouses or dockside uses, is mostly hard-surfaced used for the storage of vehicles, containers or bulk materials.
- 10.46 Located nearby along the Thames bank, at the southern edge of the port stand four wind turbines. As such the character appears entirely industrial and man-made from ground up to the skyline.
- 10.47 The Essex Project Site also includes the Tilbury Ferry Terminal, London International Cruise Terminal and floating landing stage (all Grade II* listed), along with an extensive area of level hard-surfaced land approximately 11.75 ha in area, currently used for vehicle storage.

10.48 The Essex Project Site is bounded by railways on its northern and western sides and a drainage channel to the east. Road access is gained from Fort Road at the south-eastern corner of the site. To the south lies Tilbury Railport, a large logistics shed with railway sidings operated by Maritime Transport Limited.

Visual amenity

10.49 Using landform data in a Geographical Information System (GIS), EDP has prepared an initial Zone of Theoretical Visibility (ZTV). The initial ZTV is generated using landform height data only and do not take into account other landscape features that might limit the extent of theoretical visibility, such as vegetation and buildings. The ZTV are based on the Project Site in its current form. See Figure 10.4 (edp5988_d031). As the design of the proposed development evolves, additional ZTVs will be run accounting for proposed development at varying proposed height parameters across the Project Site. A clearer picture of proposed development height parameters across the Project Site is expected to be available by the time of the production of Preliminary Environmental Information Report (PEIR).

10.50 The initial ZTV illustrates the theoretical visibility based on a 5m digital terrain model (DTM) topographical data (OS Terrain 5), assuming excellent visibility with no atmospheric attenuation. In reality, other components of the landscape such as built form and vegetation will introduce screening effects which, coupled with the atmospheric conditions, will reduce this visibility in some instances. The ZTVs will be reviewed as the development parameters are explored further and refined as the master plan develops.

10.51 For its size, the visual influence of the Project Site in its current form is limited given the extent of varying topography and built form in the local vicinity. It is expected that the visual influence of the Project Site will increase with development. The visual assessment process will determine the extent of the increase in visual influence as well as the magnitude of any visual effects that arise.

10.52 Open views of the Project Site are largely limited to those from roads and PRoW as they pass through the Project Site, although roadside vegetation provides some interruption and the speed and nature of travel limit the availability of views. Open views of the Project Site will also be available from river traffic travelling up and down the Thames towards the edges of the Kent and Essex Project Sites. In the wider landscape there will be opportunities for partial views of the proposed development from roads, PRoW, residential properties and places of work. Other sources of visual receptor include passengers on trains travelling on the HS1 route and North Kent Line Route, which both pass through the Kent Project Site.

10.53 Figures 10.4 includes 50 representative viewpoints that have been identified in the ZTV for the Project Site in its current form. These viewpoints are at locations where there are likely to be sensitive visual receptors, including receptors in designated landscapes such as Kent Downs AONB and those on PRoW and at residential properties. These viewpoints will form the basis of the visual assessment, the significance of any effect being assessed

in terms of the magnitude of change in the view and the sensitivity of the visual receptor. The location of these views is set out in the table below. However, in keeping with good practice, the proposed viewpoint, photomontage and night-time viewpoints locations for assessment will be agreed with Dartford Borough Council, Gravesham Borough Council, Thurrock Borough Council and Kent County Council and reviewed as the project evolves.

Table 10.3: Proposed viewpoint locations

Viewpoint number	Viewpoint location	Borough	Receptors
1	Footpath DS1 Swanscombe Peninsula	Dartford	Recreational users;
2	Footpath DS1, Black Duck Marsh	Dartford	Recreational users;
3	Footpath DS1 and NU1, Green Manor Way	Dartford/ Gravesham	Recreational users;
4	Footpath DS2, Swanscombe Peninsula	Dartford	Recreational users;
5	Galley Hill Way/ Pilgrim's Road	Dartford	Road users; Recreational users; Residents;
6	St Peter and St Paul Church Swanscombe	Dartford	Recreational users; Residents;
7	Leonard Avenue	Dartford	Residents;
8	Rear of Leonard Avenue	Dartford	Recreational users; Residents;
9	Swanscombe Heritage Park	Dartford	Recreational users;
10	Knockhall Road	Dartford	Road users; Residents;
11	Ingress Abbey	Dartford	Residents;
12	Greenhithe Riverfront, Sara Crescent	Dartford	Residents;
13	A44260 looking south	Dartford	Road users;
14	A2260 looking north	Dartford	Road users;
15	Bakers Hole SSSI and Scheduled Monument near Ebbsfleet International	Dartford	Road users; Railway users;
16	Ebbsfleet International Car Park	Dartford	Road users;
17	Rosherville Quays, Gravesend Riverfront	Gravesham	Recreational users;
18	North Kent Avenue	Gravesham	Residents;
19	Northfleet Lighthouse/Bevan's War Memorial	Gravesham	Recreational users; Employees;
20	Opposite Rosherville Primary School	Gravesham	Road users; Residents; Students;
21	Stonebridge Road B2175	Gravesham	Road users;

Viewpoint number	Viewpoint location	Borough	Receptors
			Residents;
22	Footpath NU1 Botany Marshes near Britannia Refined Metals Ltd	Gravesham	Recreational users; Employees;
23	Footpath NU1, Botany Marshes near CEMEX	Gravesham	Recreational users; Employees;
24	Thames Path Promoted Route near Charles Park	Dartford	Recreational users; Employees;
25	High House, Production Park, Purfleet	Thurrock	Employees; Recreational users;
26	Footpath 170 south of Proctor and Gamble	Thurrock	Recreational users;
27	Footpath 141 Stone Ness	Thurrock	Recreational users;
28	Opposite Devonshire Place, Devonshire Road	Thurrock	Road users; Residents;
29	Timber Court and Coal Court	Thurrock	Residents;
30	The Promenade, Grays	Thurrock	Recreational users; Residents;
31	Grays Beach Riverside Park	Thurrock	Recreational users;
32	Footpath 186, Tilbury and Grays	Thurrock	Recreational users;
33	Chadwell Bypass	Thurrock	Road users; Residents;
34	St. Mary's Church, Chadwell St. Mary	Thurrock	Residents;
35	Coalhouse Fort	Thurrock	Recreational users; Visitors of local attraction;
36	Footpath 68, West Tilbury	Thurrock	Recreational users;
37	Byway 98, Tilbury Fort	Thurrock	Recreational users; Visitors of local attraction;
38	Footpath 146, Tilbury	Thurrock	Recreational users;
39	London International Cruise Terminal	Thurrock	Recreational users; Commuters; International Cruise Ship passengers; Visitors of local attraction;
40	Railway Street, Northfleet	Gravesham	Residents;
41	Footpath NS177, Cobham, Kent Downs AONB	Gravesham	Recreational users;
42	A227 Wrotham Road	Gravesham	Road users; Recreational users;
43	New Barn Road, Scadbury Manor	Dartford	Road users;

Viewpoint number	Viewpoint location	Borough	Receptors
44	Footpath DR126, Park Corner Road, Northend	Dartford	Recreational users; Employees;
45	Restricted Byway DR129	Dartford	Recreational users; Road users;
46	Candy Dene	Dartford	Residents;
47	Hall Road Bridge, B262	Dartford/ Gravesham	Road users;
48	A2260, Ebbsfleet International	Dartford	Road users;
49	Windmill Hill Park	Gravesham	Recreational users;
50	Gravesend to Tilbury Ferry	Gravesham /Thurrock	Commuters; International Cruise Ship passengers

PRELIMINARY ASSESSMENT OF POTENTIAL EFFECTS

- 10.54 The landscape and visual assessment has already commenced and has examined the current landscape and visual baseline conditions within the Project Site and evaluated the broader context, including landscape, landscape related designations and other environmental considerations as illustrated in figures 10.1 and 10.2 (drawing edp5988_d005).
- 10.55 The assessment process will involve an iterative analysis of the likely landscape and visual effects of the evolving development proposals. Where likely significant adverse effects cannot be avoided through design, additional mitigation measures will be considered.
- 10.56 The most notable landscape effect as a result of the development would be the change in character from a mosaic of marshland, scrub, cleared brownfield land, former quarries, industrial works and disused industrial works to an entertainment resort and associated infrastructure across much of the Project Site. Other potential effects include the removal of sections of hedgerow and trees to allow for access and layout, together with the planting of new hedgerows and trees to strengthen the structure of the landscape.
- 10.57 The main potential likely significant landscape and visual effects of the proposed development during construction are anticipated to include:
- Security set-up activities;
 - Removal of trees/scrub vegetation associated with site clearance and construction works throughout the Project Site;
 - Ground treatment and CKD remediation activities as well as soil investigation work and treatment;

- Land re-profiling and re-grading;
- Tunnel construction through chalk spines and vehicular haulage route construction;
- Laydown, storage compound and welfare area construction;
- Establishment of batching plant on-site;
- Identification, relocation and re-provision of utility infrastructure, including potential diversion of some existing drainage features and new drainage works;
- Construction of transport infrastructure elements, events spaces, attractions, hotels, parking structures, other buildings and hard landscaped areas;
- Enhancements to the existing wharf on the River Thames to facilitate access by boat for the delivery of construction materials.

10.58 The main potential likely significant landscape and visual effects of the proposed development once completed, irrespective of any mitigation measures, are summarised below:

- Potential landscape impacts caused by the operational development would generally be localised in scale and restricted to the change in land use and character across the Project Site itself and changes in character in the immediate environs as a result of changes in views;
- Changes to the character of the landscape of the Project Site, through the change in land use, the introduction of new temporary and permanent built features and infrastructure. These would have permanent long-term effects on landscape character. A permanent, long-term impact on landscape character would occur due to physical impact on landscape of the Kent Project Site in particular, including ground remodelling, tunnelling and the introduction of new built and natural features within existing scrub, marsh and former and existing industrial land. Whilst the scale of change in built form and the loss of some natural habitat is likely to give rise to adverse landscape and visual impacts across some parts of the Project Site, the change in character from run-down former industrial site/industrial dump to a vibrant entertainment resort is likely to be beneficial in others. There would also be additional beneficial effects such as the creation of new wildlife habitats and enhancements to existing habitats within the DCO boundary;
- The increase in movement of vehicles and people in the Project Site and surrounding area, including an increase in river traffic as well as an increase in light pollution from street lighting, floodlighting and the internal lighting of buildings are also likely to give rise to adverse visual, noise and landscape character impacts during the hours of

darkness as well as during the day, particularly with regard to the Kent Project Site;

- There would be a combination of adverse and beneficial physical impact on landscape elements and features within the Project Site, caused by the localised removal of existing landscape features such as marshland and scrub as well as the removal of disused and run-down built elements within the Project Site;
- Similarly there would be adverse and beneficial effects on geological and hydrological features within the Project Site caused through land re-profiling and regrading, with the redirection and enhancement of some waterbodies;
- Potential adverse visual effects upon close proximity views from roads include (but are not limited to) the A2, A226, A296, A2260, B259, B262, Galley Hill Road and Ferry Road; National Cycle Routes, PRoW, Swanscombe Heritage Park (Country Park) Botany Marshes, river traffic, HS1 and North Kent Line and residential receptors due to the visibility of the completed scheme (including built development, traffic and lighting).

Potential effects upon the metropolitan green belt

10.59 Effects on the landscape and visual character and openness of the metropolitan green belt, into which the southern edge of the DCO Order Limits for the Kent Project Site extends, are expected to be limited.

10.60 The anticipated works to the A2 access corridor are likely to experience minor changes due to the A2(T)/B259 junction improvement works. Considered alongside landscape and visual mitigation strategies, it is anticipated that the proposed access corridor and junction improvements would be successfully integrated into the landscape with limited significant adverse effects and an overall impact similar in nature to the baseline scenario. The effects on the openness and permanence of the Green Belt are not expected to be affected to a notable degree.

APPROACH AND METHODOLOGY

10.61 The methodology for undertaking the Landscape and Visual Assessment will follow the guidelines set out in the third edition of *Guidelines for Landscape and Visual Impact Assessment* (GLVIA - Landscape Institute and Institute of Environmental Management and Assessment, 2013). This will be used as a basic approach and amended as necessary to cover specific site issues.

10.62 Viewpoint photography and verified views will be taken in accordance the latest best practice guidance issued in September 2019: *Visual Representation of Development Proposals* (Technical Guidance Note 06/19, Landscape Institute).

10.63 The first stage of the assessment is to establish the distinct baseline conditions of both the Kent Project Site and Essex Project Site and their surrounding area, which includes

identifying the landscape character and key features of the landscape and whether any landscape designations affect the site. Sources examined for the desktop study include:

- Local planning policy;
- Landscape and heritage designations;
- Natural England's National Character Areas;
- District and local level character areas;
- Natural England's Natural Area Profile;
- Public rights of way;
- Local OS maps;
- Aerial photographs.

10.64 Site appraisal has commenced and will be continued in order to:

- Confirm the extent of study areas for the landscape and visual assessments respectively;
- Identify and confirm the arboricultural resource in accordance with BS 5837:2012;
- Confirm the status of baseline conditions identified by the desktop survey;
- Confirm the landscape character areas within the study area and compare these to the actual baseline condition. This will also include consideration of the parallel archaeology and heritage, ecology and arboricultural assessments; and
- Identify the Primary Visual Envelope of the site and record key viewpoints from within this, which will be used to inform the landscape and visual assessment of the proposed development.

10.65 The second stage of the landscape and visual assessment would seek to describe and make judgements on:

- *Landscape effects* that might arise as a result of the proposed development on discrete landscape character areas and/or character types comprising features that may possess a particular quality or merit as well as effects on the landscape elements and features within the DCO boundary itself;
- *Visual effects* that might arise as a result of the proposed development on views from visual receptors, such as users of local rights of way, and upon the amenity value of

the views from surrounding uses.

- 10.66 In order to consider the likely significance of any effect, the sensitivity of each receptor is combined with the predicted magnitude of change to determine the significance of effect, with reference also made to the geographical extent, duration and reversibility of the effect within the assessment. Having taken such a wide range of factors into account when assessing sensitivity and magnitude at each receptor, the significance of effect can be derived by combining the sensitivity and magnitude in accordance with the matrix in Table 10.4.

Table 10.4: Level of effects matrix

Overall Sensitivity	Overall magnitude of change				
	Very High	High	Medium	Low	Very Low
Very High	Substantial	Major	Major/- Moderate	Moderate	Moderate/ Minor
High	Major	Major/- Moderate	Moderate	Moderate/ Minor	Minor
Medium	Major/- Moderate	Moderate	Moderate/ Minor	Minor	Minor/ Negligible
Low	Moderate	Moderate/ Minor	Minor	Minor/ Negligible	Negligible
Very Low	Moderate/ -Minor	Minor	Minor/ Negligible	Negligible	Negligible/ None

- 10.67 Each effect will be described and evaluated individually through the combination of all of the relevant factors and assessed as either significant or not significant. For landscape and visual effects, those effects identified at a substantial, major, major/moderate or moderate level (bold type within matrix above) are generally considered to be significant and those effects assessed at a moderate/minor, minor, minor/negligible or negligible level are considered to be not significant.
- 10.68 In certain cases, where additional factors may arise, a further degree of professional judgement might be applied when determining whether the overall change in the view will be significant or not and, where this occurs, this will be explained in the assessment.
- 10.69 Measures to mitigate any adverse visual effects upon the landscape value and visual quality of the area will be integral to the design process, with the master plan being refined in response to the findings of the assessment work with regard to layout, scale and massing, materials and finishes. Landscape elements will be included in the parameter plans as 'designed in' mitigation.
- 10.70 Finally, an assessment of any residual effects that might arise following the incorporation of mitigation measures will be undertaken and the significance of these effects stated. The evaluation of residual effects will be considered for Year 1 and Year 15. This allows for the consideration of the screening effects of screen planting that will be incorporated

as mitigation for the development.

- 10.71 Consideration will also be given to cumulative effects. These generally occur where there may be simultaneous or sequential visibility of two or more developments of the same type and scale, or where the consideration of other schemes would increase an effect identified. Where other similar schemes are in the planning system and made known to the applicant, or are under construction, these are considered in conjunction with the Project Site.
- 10.72 In addition, the assessment of landscape effects will include a full BS 5837:2012 compliant tree survey and report, and an Arboricultural Impact Assessment which will be appended to the Landscape and Visual Chapter of the ES.
- 10.73 EDP is also undertaking an assessment of the likely impacts of the Proposed Development on existing PRoW in the Project Site and its immediate vicinity. A PRoW strategy to mitigate for any changes in the routing and amenity of existing PRoW will be included as part of this assessment and will be appended to the Landscape and Visual Chapter of the ES⁵.
- 10.74 The final output of the exercise will be to provide text and illustrative material which:
- Establishes the baseline conditions at a point at which the Project Site will become available for development;
 - Assesses the landscapes sensitivity to change of nature and extent of the proposed development;
 - Assesses the landscape and visual impact of the development on the Project Site and relevant surrounding area;
 - Identifies areas of landscape and visual concern and/or benefit in relation to the development and during its construction;
 - Advises on any proposals to mitigate significant negative effects;
 - Identifies the residual impacts of the proposed development.

⁵ The PROW assessment deals with matters related to informal recreation only, including walking, cycling, horse-riding and other recreational pursuits such as bird watching or picnicking. It does not include an assessment of the requirements for, and accessibility of, formal open space or the activities associated with this, such as organised football practice or matches on marked out football pitches.

PROPOSED AVOIDANCE AND MITIGATION MEASURES

10.75 A number of opportunities exist to improve and enhance the structure of the landscape across the area. A strong framework of green infrastructure across the Project Site will be delivered incorporating hedgerow and woodland planting as well as enhancements of marshland, saltmarsh and creation of public open space that will include connectivity to the landscape beyond the Kent Project Site bringing a number of biodiversity, landscape and recreational connectivity benefits. The Essex Project Site is predominantly urbanised and provides little opportunity for enhancement of existing green infrastructure, but does however have good PRoW and NCN links of which could be utilised.

10.76 As stated within Green Infrastructure: An integrated approach to land use (Landscape Institute):

“Green Infrastructure is the network of natural and semi-natural features, green spaces, rivers and lakes that intersperse and connect villages, towns and cities. Individually, these elements are GI assets, and the roles that these assets play are GI functions. When appropriately planned, designed and managed, the assets and functions have the potential to deliver a wide range of benefits – from providing sustainable transport links to mitigating and adapting the effects of climate change.”

10.77 Key opportunities to improve the green infrastructure network include:

- Provision of high quality public open space and community routes, utilising the Project Site’s riverside landscape framework where possible;
- Enhancement of biodiversity corridors within the Kent Project Site, particularly areas of wet marshland and saltmarsh, seeking opportunities to extend these areas where feasible;
- Retention of existing ecologically important features and habitats within the Kent Project Site where possible, particularly where these relate to marshland areas;
- Enhancement of pedestrian/cycle connections through the Kent and Essex Project Sites;
- Provision of Sustainable Drainage Systems;
- Delivery of a net gain in tree planting across the site to address climate change; and
- Development of a sensitive lighting strategy which follows key parameters designed to limit light spill such as maximum heights, directional units and specific light sources.

UNCERTAINTIES

- 10.78 Baseline conditions will be established using existing assessments, available documentation and field assessment; it is important to note that this information may change before or during the construction and operation of the Proposed Development.
- 10.79 Within reasonable limits, the assessment is undertaken in consideration of the ‘worst case’ scenario for the development, i.e. those potential outcomes, situations or location that would result in the most elevated effect on landscape and visual receptors. It therefore identifies the greatest degree of change likely to accrue and may be subject to mitigating factors or alternative conditions, that might reduce those effects. For example, visual effects are considered in both summer and winter context; although the magnitude of change and effect is expressed for winter landscape conditions when trees are bare of leaf cover and the visibility of development is at its greatest. Where this is the case, the assessment identifies alternative conditions or further mitigation which might result in impacts being less pronounced.
- 10.80 The assessment will apply a pre-determined methodology to arrive at conclusions. This procedure brings a degree of objective, procedural rigor into what otherwise might be judged to be ‘personal opinion’. Professional judgement still plays its part, but the purpose of adopting a methodology is to make the process as clear and logical as possible.
- 10.81 The assessment will be undertaken with regard to the phases of development and assumed build rate therein. A Landscape Strategy Document to be submitted with the planning application, will illustrate proposed planting, hard surface treatments and habitat creation within other open areas. This will be accompanied by an appropriate management plan, to be agreed with the respective Councils.

MATTERS TO BE SCOPED OUT

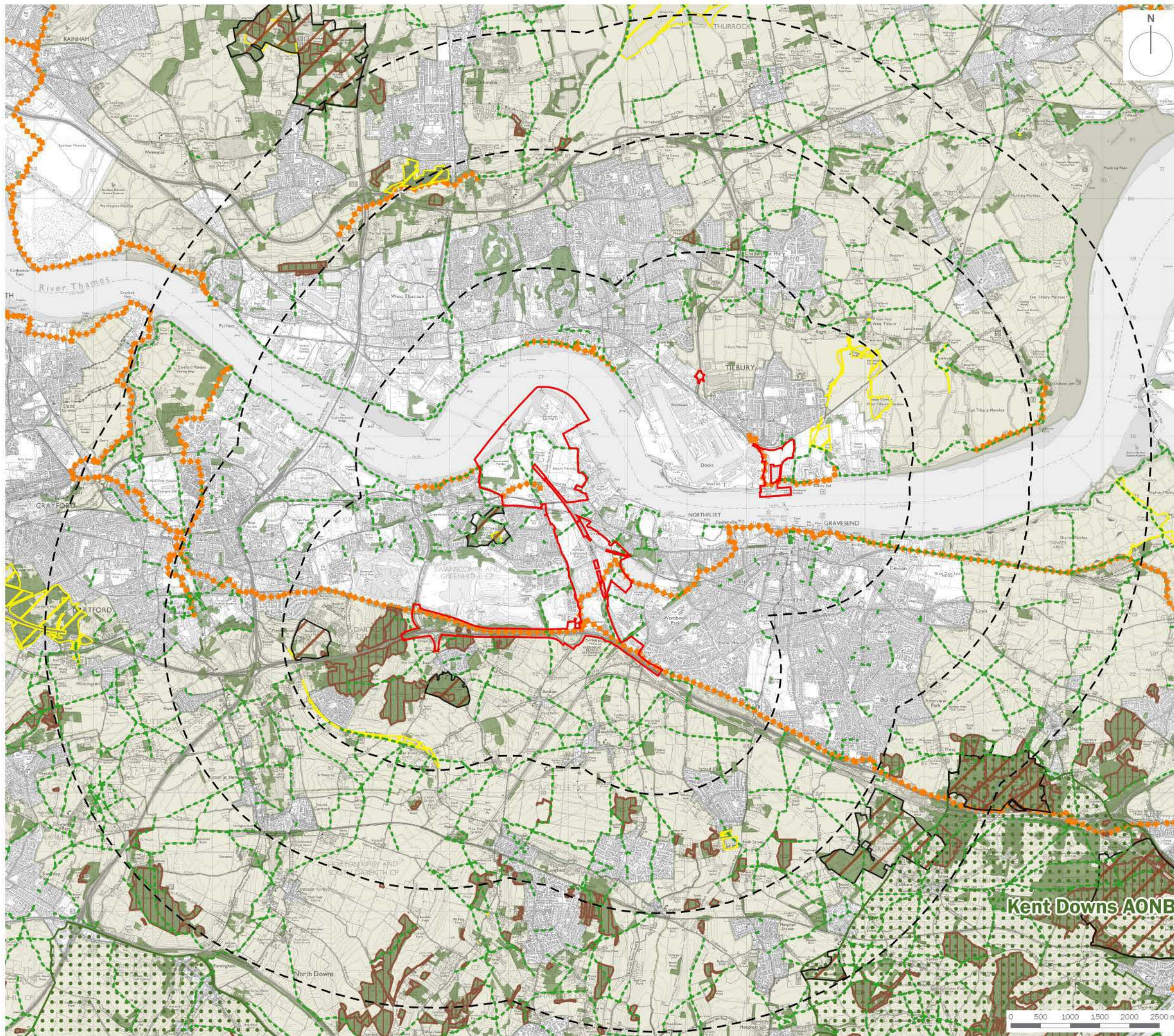
- 10.82 At this stage, no topics are proposed to be scoped out of the assessment. However, this position may change in light of further baseline survey work and design development.

SUMMARY

- 10.83 The Project Site is not covered by any statutory landscape designations and could be designed and developed in accordance with national and local landscape planning policy.
- 10.84 There are no significant constraints to development in landscape, visual and arboricultural terms. However, development of the Project Site in the manner proposed would alter the character of the landscape in the local area, particularly the Kent Project Site. Given the existing Cruise Terminal nature of the Essex Project Site and the nature of the intended proposals at this location are unlikely to result in a radical change in character.
- 10.85 Whilst the landscape of the Project Site are not subject to a protective designation, it is crossed by public rights of way and both the Kent Project Site and Essex Project Sites are

visible to a variety of receptors locally. Detractors such as the noise and movement from the adjacent residential and industrial areas, main roads and railway lines strongly 'urbanise' the landscape in perceptual and sensory terms such that neither Site has the character of open rural countryside.

- 10.86 Opportunities exist to improve and enhance the structure of the landscape across the area, particularly with the Kent Project Site, which has been partially degraded and fragmented with the intensification of industrial and commercial practices but does still however retain a number of distinctive landscape features and fabric. A strong framework of green infrastructure across the Kent Project Site is likely to be required as mitigation and, incorporating hedgerow and woodland planting and connectivity to the landscape beyond the Kent Site. In terms of the Essex Project Site which is almost entirely urban and manmade, opportunity exists for enhancement of landscape fabric and features that remain, in addition to protection, enhancement and creation of public rights of way or riverside access in general.



- DCO Boundary
- Range Rings (at 2km intervals)
- Landscape Designations**
- Kent Downs AONB
- Other Relevant Considerations**
- Ancient Woodland
- National Forest Inventory
- Metropolitan Green Belt
- Public Access**
- National Cycle Routes
- Public Rights of Way
- Open Access Land (CRoW Act 2000)
- Country Parks

client
The London Resort Company Holdings Ltd

project title
The London Resort

drawing title
Figure 10.1: Landscape Designations and Other Considerations

date	08 JUNE 2020	drawn by	OK
drawing number	edp5988_d005c	checked	FM
scale	Refer to scale bar @ A3	QA	GY



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client
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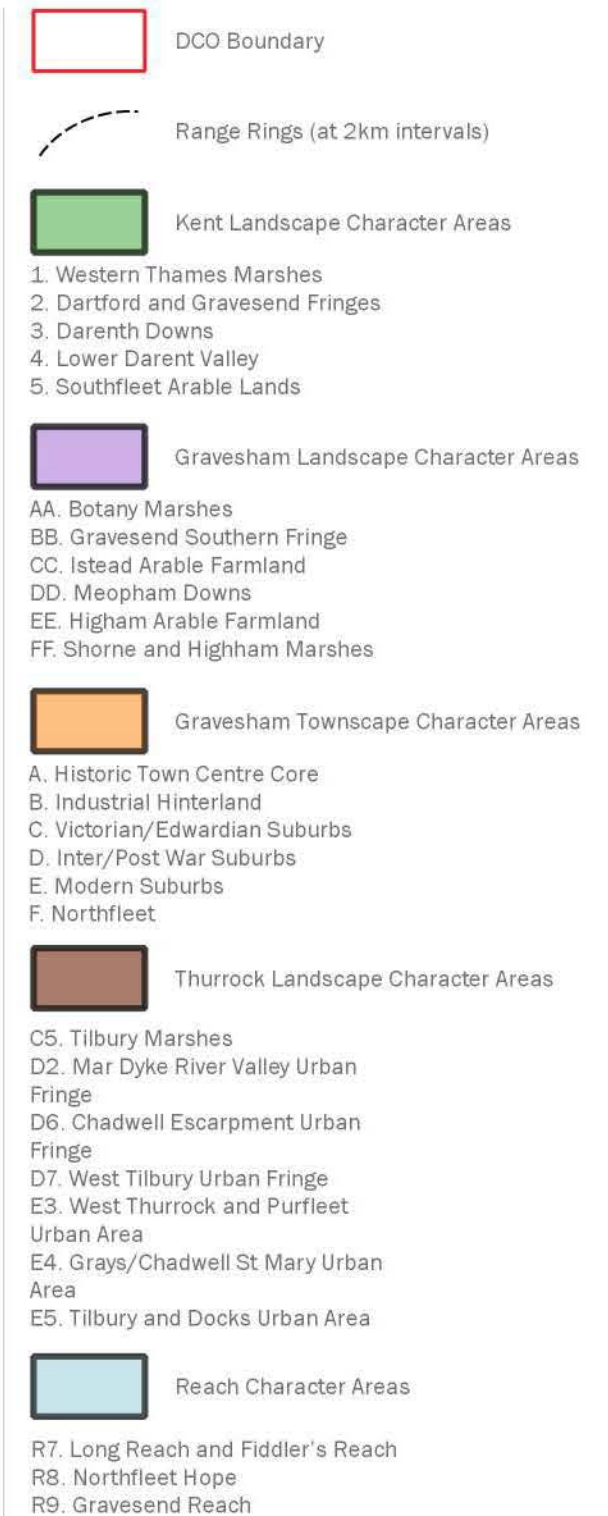
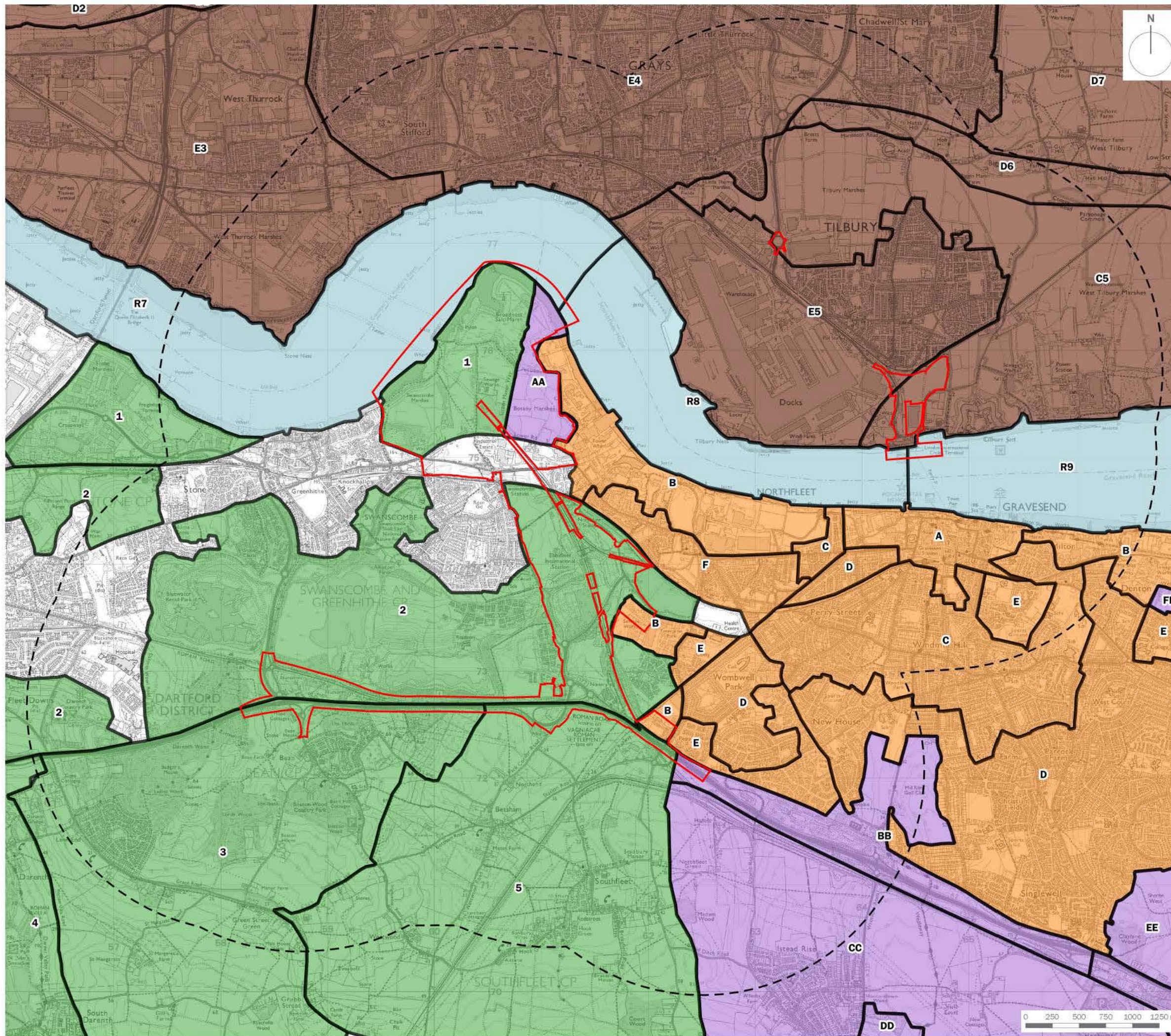
project title
The London Resort

drawing title
Figure 10.2: Other Environmental Considerations

date	09 JUNE 2020	drawn by	OK
drawing number	edp5988_d034c	checked	FM
scale	Refer to scale bar @ A3	QA	GY



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drawing title
Figure 10.3: Published Landscape Character Areas

date	09 JUNE 2020	drawn by	OK
drawing number	edp5988_d011c	checked	FM
scale	Refer to scale bar @ A3	QA	GY



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- DCO Boundary
- Range Rings (at 2km intervals)
- Potential Viewpoint Locations
- Zone of Theoretical Visibility (ZTV)
Based upon the Project Site in its current form

client
The London Resort Company Holdings Ltd

project title
The London Resort

drawing title
**Figure 10.4: Zone of Theoretical Visibility
 (Based on the Project Site in its current form)**

date	08 JUNE 2020	drawn by	OK
drawing number	edp5988_d031c	checked	FM
scale	Refer to scale bar @ A3	QA	GY



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Eleven ◆ Terrestrial and freshwater ecology and biodiversity

INTRODUCTION

- 11.1 The Terrestrial and Freshwater Ecology and Biodiversity chapter of the Environmental Statement (ES) will evaluate the likely significant effects of the Proposed Development in terms of terrestrial and freshwater ecology and nature conservation. To do this, an Ecological Impact Assessment (EclA) will be undertaken based on the up to date ecology baseline data being gathered throughout winter 2019/2020 and the remainder of 2020, and with consideration to previous survey works collated between 2012 and 2016.
- 11.2 In addition, the Applicant will consult with the Planning Inspectorate (PINS), Kent County Council (KCC), Dartford Borough Council (DBC), Ebbsfleet Development Corporation (EDC), Gravesham Borough Council (GBC), Thurrock Council (TC), local interest groups, the Environment Agency (EA) and Natural England (NE) on the scope of these surveys and recommended mitigation. Cumulative effects arising from the effect of the proposal in conjunction with other developments will also be considered.

RELEVANT LAW, POLICY AND GUIDANCE

Legislative and Policy Context

- 11.3 In preparing the EclA, the following Acts of Parliament and Regulations, considered of primary relevance, will be referred to:
- The Conservation of Habitats and Species Regulations 2017 (as amended), known as the 'Habitat Regulations', which implement European Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Fauna and Flora (the 'Habitats Directive') and European Directive 2009/147/EC on the Conservation of Wild Birds ('Birds Directive');
 - Water Framework Directive (WFD) (2000/60/EC)
 - Ramsar Convention on Wetlands of International Importance 1972;
 - The Wildlife and Countryside Act 1981 (as amended);
 - The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017;

- The Countryside and Rights of Way (CROW) Act 2000;
- The Natural Environment and Rural Communities (NERC) Act 2006;
- The Protection of Badgers Act 1992; and
- Hedgerow Regulations 1997

Policy Framework

National Policy

National Policy Statements

11.4 National Policy Statements (NPS) set out the need for and government’s policies to deliver Nationally Significant Infrastructure Projects (NSIPs) in England. Chapter three of this report explains that there is no NPS for business and commercial NSIP projects. However, to the extent that the Project includes highways and transport infrastructure, regard will be had to relevant policy in the NPS for National Networks, including:

- Environmental and social impacts (NPA paragraphs 3.2 to 3.5);
- Habitats Regulations Assessment (HRA) (NPA paragraphs 4.22 to 4.25);
- Climate change adaptation (NPS paragraphs 4.36 to 4.47); and
- Biodiversity and ecological conservation (NPS paragraphs 5.20 to 5.38).

National Planning Policy Framework

11.5 Paragraph 5 of the National Planning Policy Framework¹ (NPPF, February 2019) states:

“The Framework does not contain specific policies for nationally significant infrastructure projects. These are determined in accordance with the decision-making framework in the Planning Act 2008 (as amended) and relevant national policy statements for major infrastructure, as well as any other matters that are relevant (which may include the National Planning Policy Framework). National policy statements form part of the overall framework of national planning policy, and may be a material consideration in preparing plans and making decisions on planning applications.”

¹ Ministry of Housing, Communities and Local Government (June, 2019) ‘National Planning Policy Framework’.

- 11.6 In preparing this chapter regard will be given to the relevant parts of the NPS and the NPPF, particularly during the assessment process. Relevant guidance from National Planning Practice Guidance² (NPPG, updated October 2019) will also be adhered to.
- 11.7 The Government's current planning policies on land use planning in England are set out in the NPPF. The following NPPF policies are relevant to consideration of terrestrial ecology and biodiversity:

- Policy 15 – Conserving and enhancing the natural environment.

National Planning Practice Guidance

- 11.8 Planning Practice Guidance on the natural environment supports the NPPF by explaining the government's planning policies for England, in regard to (amongst others) the protection and enhancement of biodiversity, ecosystem and green infrastructure, and how these are expected to be applied.

Local Plan Policy

- 11.9 The Project Site lies partly within three local planning authority areas, namely Dartford Borough and Gravesham Borough for the Kent Project Site, and Thurrock Council for the Essex Site. Relevant local planning policies related to ecology and biodiversity from these three administrations are provided below:

- Gravesham Local Plan Core Strategy (adopted September 2014):
 - Policy CS12: Green Infrastructure.
- Dartford Local Plan Core Strategy (adopted September 2011):
 - Policy CS14: Green Space.
- Dartford Development Policies Plan (adopted July 2017):
 - Policy DP5: Environmental and Amenity Protection; and
 - Policy DP25: Nature Conservation and Enhancement.
- Thurrock Council Core Strategy and Policies for Management of Development (as amended) (Adopted January 2015):
 - Policy CSTP18: Green Infrastructure; and

² <https://www.gov.uk/guidance/natural-environment#biodiversity-geodiversity-and-ecosystems>

- Policy CSTP19: Biodiversity.

Best Practice Guidance

- 11.10 The identification and evaluation of Important Ecological Features (IEFs) for the purposes of EclA, and the assessment of significant adverse or beneficial effects on IEFs, will be undertaken with reference to the Chartered Institute of Ecology and Environmental Management (CIEEM) 'Guidelines for Ecological Impact Assessment in the UK and Ireland, September 2018 (Version 1.1, updated September 2019).
- 11.11 The following best practice guidance in relation to survey techniques has been taken into account throughout the completion of baseline studies, and will be referred to in regard to any mitigation/ compensation measures proposed within the EclA:
- Joint Nature Conservation Committee, (2010). Handbook for Phase 1 habitat survey: A Technique for Environmental Audit;
 - English Nature, (2004). Bat Mitigation Guidelines;
 - Collins, J. (ed.) (2016). Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation Trust, London;
 - Joint Nature Conservation Committee, (1999). Bat Workers Manual;
 - Paul Bright, Pat Morris and Tony Mitchell-Jones. (2006) 'The dormouse conservation handbook', Second edition. English Nature;
 - Marchant, J. H. (1983). Common Birds Census Instructions. BTO, Tring. 12pp.;
 - Marchant, J. H., Hudson, R., Carter, S. P. & Whittington, P. A. (1990) Population Trends in British Breeding Birds. BTO, Tring;
 - Gilbert, G., Gibbons, D. W. & Evans, J. (1998) Bird Monitoring Methods. RSPB, Sandy, Bedfordshire;
 - Dean, M., Strachan, R., Gow, D. and Andrews, R. (2016). *The Water Vole Mitigation Handbook (The Mammal Society Mitigation Guidelines Series)*. Eds Fiona Mathews and Paul Chanin. The Mammal Society, London.;

- Harris, S., Cresswell, P., and Jeffries, D.J. (1989). Surveying Badgers, Mammal Society, London;
- Froglife. (1999). Reptile survey: an introduction to planning, conducting and interpreting surveys for snake and lizard conservation. Froglife Advice Sheet 10, Froglife, Halesworth;
- Gent, T., Gibson, S. (1999). Herpetofauna Workers Manual. JNCC;
- English Nature, 2004. Reptiles: Guidelines for Developers;
- National Rivers Authority (1992). River Corridor Surveys. Conservation Technical Handbook Number 1. NRA, Bristol;
- Environment Agency (2003). River Habitat Survey in Britain and Ireland. Field Survey Guidance Manual: 2003. Bristol;
- Environment Agency (1999) Procedures for Collecting and Analysis Macroinvertebrate Samples (issue 2.0), Environment Agency BT001.
- Environment Agency. Freshwater macro-invertebrate sampling in rivers: Operational Instructions 018 08 Issued 16/06/09. Environment Agency, Bristol.
- Murray-Bligh, J.A.D., Furse, M.T., Jones, F.H., Gunn, R.J.M, Dines, R.A. and Wright, J.F. (1997) Procedure for collecting and analysing macroinvertebrate samples for RIVPACS. Joint publication by the Institute of Freshwater Ecology and the Environment Agency, 162 pp.

THE 2014 SCOPING OPINION

- 11.12 On 10th November 2014, the Secretary of State received a Scoping Report submitted by London Resort Company Holdings under Regulation 8 of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2009 (SI 2263) (as amended) (the EIA Regulations) in order to request a scoping opinion for the proposed London Resort ('the Project Site'). At this stage, the Project Site consisted solely of the Kent Project Site.
- 11.13 The Secretary of State provided their Scoping Opinion on the information to be provided in the Environmental Statement (ES) in December 2014. EDP has noted the previous comments in relation to the ecology scope and seeks to address the Secretary of State's advice and recommendations (see Table 11.1) in the updated scope described below.

Table 11.1: Planning Inspectorate’s comments from EIA Scoping Opinion in relation to Ecology (December 2014).

Paragraph	Inspectorate’s comments	Action taken
3.25	<p>The Secretary of State recommends that surveys should be up to date and carried out in accordance with the relevant best practice guidance and accepted professional standards, including ensuring that surveys are carried out at the appropriate time of year.</p> <p>The Secretary of State advises that the ES should contain all of the baseline information needed for the assessment of potentially significant environmental effects.</p>	A comprehensive suite of ecology surveys are being undertaken in accordance with best practice guidance at appropriate times of year. The proposed methodologies are provided along with this Scoping Report
3.26	The Secretary of State recommends that the proposals should address fully the needs of protecting and enhancing biodiversity. The assessment should cover habitats, species and processes within the site and its surroundings. The Secretary of State draws attention in particular, but not exclusively, to the effects on water birds and on intertidal and coastal habitats.	Consideration will be given to the protection and enhancement of biodiversity within the assessment, including (but not limited to) water birds and on intertidal and coastal habitats.
3.27	The potential impacts on international and nationally designated sites should be addressed as well as county level habitats. The Secretary of State notes the presence of Baker’s Hole SSSI within the development area, and a number of other SSSI and nationally and locally designated sites within the surrounding area. The archaeological interest of these sites should be considered within the cultural heritage topic. The geological interest of these sites may be better considered within the soils and ground conditions chapter rather than the ecology chapter.	Full consideration will be given to the potential impacts on internal and national designed sites within the potential zone of influence of the Project Site. It is acknowledged, and agreed, that the archaeological interest of Baker’s Hole SSSI should be considered in the cultural heritage topic, and that the geological interest is best considered within the soils and ground conditions chapter, rather than the ecology chapter.
3.28	The Secretary of State notes the possible need for a Habitats Regulations Assessment in view of the development site’s location in relation to the Thames Estuary & Marshes SPA and Ramsar site, the Medway Estuary & Marshes SPA/Ramsar and the Swale SPA/Ramsar, and the potential impacts resulting from the development. The applicant’s attention is drawn to the response from the MMO, NE, and GBC (in Appendix 2) regarding the need for this assessment, and further advice is provided in Section 4 of this Opinion.	The Applicant will provide sufficient information to the Competent Authority to enable them to carry out a Habitat Regulations Assessment (HRA) if required.

Paragraph	Inspectorate’s comments	Action taken
3.29	The assessment should take account of impacts of noise and vibration, lighting, and air quality (including dust), and cross reference should be made to these specialist reports. The Secretary of State considers that the proposals would result in a significant increase in visitor pressure and associated disturbance, and this aspect is also highlighted by comments received from the EA and provided in Appendix 2 of this Opinion. Reference should be made to the design of the proposed flood defences and other proposed landscaping and drainage features across the site, and how these may impact existing habitats and the use of the area by water birds and other species of conservation concern; both negatively, and positively where opportunities to provide mitigation and enhancement for ecological features have been sought. The applicant’s attention is drawn to comments received by the EA in this regard (Appendix 2).	The ecology assessment will consider both direct impacts, and also indirect impacts, such as noise, vibration, lighting, air quality (including dust), as referred to in the Inspectorate’s response. To sufficiently assess the nature and significant of these potential impacts, reference will be made to specialist reports and mitigation strategies designed through interdisciplinary collaboration.
3.30	The operational and decommissioning phases of the works should be addressed. The Secretary of State recommends the need to consider cumulative and combined impacts and advises this is particularly relevant in terms of assessing the impacts on ecology. The scope of the cumulative impact assessment should be agreed with the relevant consultees.	The ecology assessment will consider both the operational and decommissioning phases of the works. EDP shall seek to agree the scope of cumulative impacts with regards to ecology with consultees.

CONSULTATION FEEDBACK

11.14 The consultation responses received to the 2014 Scoping Report are provided in full within the 2014 ‘Scoping Opinion’³ Report (December 2014). Extracts from the consultation responses received by NE, the EA, DBC, GBC, and Kent County Council (KCC) are provided in Table 11.2 below. The consultation responses received have been used to inform the scope of the current EIA.

³ The Planning Inspectorate (December, 2014) Scoping Opinion for London Paramount Entertainment Resort.

Table 11.2 Extracts of consultation responses to 2014 Scoping Report

Consultee	Response
<p>Natural England</p>	<p>Sites of Special Scientific Interest (SSSIs) and sites of European or international importance (Special Areas of Conservation, Special Protection Areas and Ramsar sites)</p> <p>The development consent order (DCO) boundary encompasses the following designated nature conservation site:</p> <ul style="list-style-type: none"> • Bakers Hole Site of Special Scientific Interest (SSSI). <p>The proposed development also has the potential to impact indirectly the following designated sites:</p> <ul style="list-style-type: none"> • Darenth Woods SSSI; • Medway Estuary and Marshes SSSI, SPA and Ramsar Site; • Rainham Marshes SSSI; • South Thames Estuary and Marshes SSSI; • Thames Estuary and Marshes Special Protection Area and Ramsar Site; • Swanscombe Skull Site SSSI and National Nature Reserve; and • West Thurrock Lagoon and Marshes SSSI. <p>The Environmental Statement should include a full assessment of the direct and indirect effects of the development on the features of special interest within these designated sites and should identify such mitigation measures as may be required in order to avoid, minimise or reduce any adverse significant effects.</p> <p>Based upon the information currently provided by the applicant, possible direct effects to designated sites which will need to be considered within the environmental statement are provided below:</p> <ul style="list-style-type: none"> • Details of measures which will be provided to ensure that Bakers Hole SSSI is not subject to direct or indirect impacts (such as from damage caused by visitors) which could occur as a result of the proposal. <p>Based upon the information currently provided by the applicant, possible indirect impacts which may need to be considered within the environmental statement are provided below, although it should be noted that this list is not exhaustive:</p> <ul style="list-style-type: none"> • Loss of land within the DCO boundary which may be used as feeding and/or roosting areas by birds associated with the coastal/freshwater grazing marsh designated sites. This will require wintering bird surveys to be undertaken of the DCO site and the adjacent estuarine habitat; • Disturbance to birds associated with the coastal/freshwater grazing marsh designated sites that may be using land within the DCO boundary during both the construction and operational phases of the development; • Disturbance that may occur to birds associated with the coastal/freshwater grazing marsh designated sites that may occur

Consultee	Response
	<p>through increased boat traffic within the Thames Estuary as a result of this proposal; and</p> <ul style="list-style-type: none"> Increased recreational disturbance to birds associated with the coastal designated sites as a result of an increased number of visitors to the wider area of north Kent resulting from the proposal. The work commissioned by the North Kent Environmental Planning Group which is referenced within the scoping report will be helpful in assessing this. <p>In this case the proposal is not directly connected with, or necessary to, the management of a European site. Based upon the current information, in our view it is likely that the proposal will have a significant effect on internationally designated sites and therefore will require assessment under the Habitats Regulations. We recommend that there should be a separate section of the Environmental Statement to address impacts upon European and Ramsar sites entitled 'Information for Habitats Regulations Assessment'. The Natura 2000 network site conservation objectives are available on our internet site at http://publications.naturalengland.org.uk/category/6490068894089216 which should be of help when preparing this information.</p> <p>Regionally and Locally Important Sites The EIA will need to consider any impacts upon local wildlife and geological sites. The Environmental Statement should therefore include an assessment of the likely impacts on the wildlife and geodiversity interests of such sites. The assessment should include proposals for mitigation of any impacts and if appropriate, compensation measures.</p> <p>Protected Species - Species protected by the Wildlife and Countryside Act 1981 (as amended) and by the Conservation of Habitats and Species Regulations 2010 The environmental statement should assess the impact of all phases of the proposal on protected species (including, for example, great crested newts, reptiles, birds, water voles, badgers and bats).</p> <p>We note that the survey period for terrestrial invertebrates is due to be undertaken between April and September 2015 whilst the aquatic invertebrate survey period is proposed to run from April through to June or July (for the Swanscombe Peninsula and Ebbsfleet Valley respectively). It is recommended that aquatic invertebrate surveys are undertaken across the survey season to ensure that early and late species are recorded to provide a robust baseline against which the impacts of the proposal can be assessed.</p> <p>2.5 Habitats and Species of Principal Importance</p> <p>The environmental statement should thoroughly assess the impact of the proposals on habitats and/or species listed as 'Habitats and Species of Principal</p>

Consultee	Response
	<p>Importance' within the England Biodiversity List, published under the requirements of S41 of the Natural Environment and Rural Communities (NERC) Act 2006.</p> <p>Natural England advises that a habitat survey (equivalent to Phase 2) is carried out on the site, in order to identify any important habitats present. In addition, ornithological, botanical and invertebrate surveys should be carried out at appropriate times in the year, to establish whether any scarce or priority species are present.</p>
<p>The Environment Agency</p>	<p>We advise that the European otter should be included for consideration during the ecological appraisal. Field signs of otter have been reported to the Environment Agency on the Swanscombe Peninsula in the last 10 years. Therefore, when assessing potential impacts of the development, otters, and how they potentially use the Thames estuary, marshes and Ebbsfleet valley should be taken into account.</p> <p>There is currently no baseline data provided for aquatic invertebrates. Surveys of aquatic invertebrates are proposed between April and June 2015. We are keen to talk with the consultants for LRCH to agree the design, scope and positioning of future surveys and advise on any 3rd party data that could be used. It is important that the surveys provide a rigorous baseline. The views of Natural England and the MMO are likely to feature in advice provided to LRCH about this.</p> <p>A possible impact of not having a rigorous baseline level for aquatic invertebrates is that it may not be possible to properly assess the impacts of the development on ecology and water quality For example, the development includes a large new road in close proximity to the river Ebbsfleet. If drainage is proposed to enter the watercourse there will need to be considerable baseline data on the current water quality, together with mitigation, to ensure the quality does not deteriorate. This will also help to demonstrate that the development is acceptable in terms of the WFD.</p> <p><u>Disturbance associated with the operation of the venue and public pressure</u></p> <p>Given the current low use of the site it would be unlikely that the new resort would be able to not significantly increase disturbance to all wildlife, but particularly to seals and birds utilising the inter-tidal habitats for feeding and the site as a high tide roost.</p> <p>Therefore, adequate mitigation should be provided, as suggested in the table, such as there being a zoned approach to management, wardening and fencing for the Country Park, Black Duck Marshes and other parts of the site.</p>

Consultee	Response
	<p>The mitigations measures suggested within the table should be incorporated into the design of the site through an integrated approach. For example, if flood defences are to be set back to create inter-tidal habitats, these inter-tidal areas should be designed to be largely free from disturbance by virtue of being out of sound and direct sight lines of people, and being extensive enough to be of long-term ecological value.</p> <p>A similar approach should be taken for the creation of grassland habitats and of fresh/brackish water wetlands, by creating areas with less or no disturbance. An integrated approach to design should balance reducing disturbance for ecological benefits, with improved public access to watercourses.</p> <p><u>Permanent loss of grasslands</u></p> <p>The potential ecological mitigation measures should include the extensive reseeded of parts of the site because this is an opportunity to create grassland habitats that are far ecologically richer than those present. We also advise that mitigation measures are considered for the landscaping of the main resort area, such as green roofs, wild flower beds, and green walls.</p>
<p>Dartford Borough Council</p>	<p>The Bakers Hole SSSI is considered under ecology but should be considered as earth heritage and also under cultural heritage as it is designated for its archaeological and geological value.</p> <p>The impact of lighting at the operational stage does not appear to be included in the table of potential ecological effects.</p> <p>Kent Wildlife Trust advise that whilst they accept the use of “Guidelines or Ecological Impact Assessment published by the Chartered Institute of Ecology and Environmental Management, consideration will need to be given to adequate mitigation for habitats considered of ‘local’ value when using these. They are concerned that mitigation plans often fail to address impacts on these local habitats which can incrementally lead to significant biodiversity losses.</p> <p>The intention to consider the wider potential effects on the North Kent European sites within a Habitats Regulations Assessment is supported.</p>
<p>Gravesham Borough Council</p>	<p><u>Ecology Statement of Common Ground</u></p> <p>It is suggested that reference is made to the Statement of Common Ground between Lafarge, Kent Wildlife Trust and Gravesham Borough Council on the approach to ecology at Swanscombe Peninsula.</p> <p><u>Appropriate Assessment</u></p> <p>The production of a Habitats Regulations Assessment or more commonly termed Appropriate Assessment under the Conservation of Habitats and</p>

Consultee	Response
	<p>Species Regulations 2010, as amended, to take into account potential impact on internationally designated sites to the east of the Borough will need to have regard to the cumulative impact of all planned development and not just the London Paramount project. Potential impacts due to increased river traffic and noise/light from events and fireworks will also need to be considered and the potential of additional visitors to the area also visiting the marshes leading to further bird disturbance. Mitigation of any significant potential adverse impacts may be required and detailed discussions with Natural England would be advisable at an early stage to scope any necessary work. (Note: Appropriate Assessment is an additional assessment in relation to projects that might have significant effects on protected European habitats and species).</p>
Kent County Council	<p>It is also recommended that the ecological surveys and the planning submission (as it relates to ecology) are undertaken in accordance with the British Standard Biodiversity – Code of practice for planning and development (BS 42020:2013) and with Natural England’s Standing Advice.</p> <p>It is advised that robust ecological survey data in relation to all potential ecological impacts will be needed to inform the assessment of impacts within the EIA and to provide evidence on which to base proposals for any necessary mitigation and/or compensation measures. It is not clearly stated within the EIA Scoping Report that all the ecological surveys will be carried out in advance of the EIA being finalised.</p> <p>The intention to consider the wider potential effects on the North Kent European sites within a Habitats Regulations Assessment is welcomed.</p>

BASELINE CONDITIONS AND MAIN ISSUES

Previous Ecology Assessment

11.15 The Kent Project Site has previously been subject to a suite of ecological baseline surveys as set out in various reports prepared in 2012 which were summarised within the 2014 EIA Scoping Report received by the Secretary of State in November 2014.

11.16 The 2012 reports are available on request as listed below:

- 2012 Desk Study and Phase I Habitat Survey Report (CBA, 2012) (**Appendix 11.1**);
- 2012 Botanical Survey Report (CBA, 2012) (**Appendix 11.2**);
- 2012 Amphibian Survey Report (CBA, 2012) (**Appendix 11.3**);
- 2012 Breeding Birds Survey Report (CBA, 2012) (**Appendix 11.4**);

- 2012 Terrestrial Invertebrate Survey Report (CBA, 2012) (**Appendix 11.5**);
- 2012 Terrestrial Invertebrate Survey Supplementary Report (Spiders [Araneae] and related groups) (CBA, 2012) (**Appendix 11.6**); and
- 2012/13 Wintering Birds Survey Report (CBA, 2013) (**Appendix 11.7**).

11.17 In addition, further surveys were undertaken on the Kent Project Site throughout 2015 and 2016, the findings of which are provided in full in the following reports, also available on request:

- Phase 1 and Botanical Survey Report (CBA February 2016) (**Appendix 11.8**);
- Wintering Bird Survey Report (Corylus Ecology April 2016) (**Appendix 11.9**);
- Common Bird Survey Report (Corylus Ecology April 2016) (**Appendix 11.10**);
- Bat Activity Report 2015 (Corylus Ecology June 2016) (**Appendix 11.11**);
- Dormouse Report (Corylus Ecology February 2016) (**Appendix 11.12**);
- 2015 Harvest Mouse Survey Report (CBA February 2016) (**Appendix 11.13**);
- 2015 Water Vole Survey Report (CBA February 2016) (**Appendix 11.14**);
- 2015 Badger Survey Report (CBA February 2016) (**Appendix 11.15**);
- 2015 Amphibian Survey Report (CBA February 2016) (**Appendix 11.16**);
- 2015 & 2016 Reptile Survey Report (CBA August 2016) (**Appendix 11.17**);
- Invertebrate Survey and Assessment of the London Paramount Entertainment Resort 2015 (Edwards Ecological Services, 2015) (**Appendix 11.18**);
- An ecological survey of the waterbodies and wetlands on and around the Swanscombe Peninsula, Kent (Aseda, 2016) (**Appendix 11.19**); and
- A targeted ecological survey of selected waterbodies and wetlands on the Swanscombe peninsula, Kent (Aseda, 2016) (**Appendix 11.20**);

- Fish survey of Swanscombe Marshes (Colclough and Coates, 2015) (**Appendix 11.21**); and
- Fish survey of the Ebbsfleet Stream (Colclough and Coates, 2015) (**Appendix 11.22**).

11.18 The key findings of the above reports is provided within the 'Summary of Protected/Notable Species Records' enclosed as **Appendix 11.23**.

2020 Updated Ecology Desk Study

11.19 An updated ecological desk study was completed in April 2020 to inform the current EIA Scoping Report, and to identify any key ecological features requiring further survey and assessment during the forthcoming suite of detailed ecology surveys to be undertaken throughout 2020, as described further below. This update to the Ecology Desk Study covers both the Kent and the Essex Project Sites.

11.20 The desk study involved the collation and review of biodiversity information from a range of sources, including:

- Kent and Medway Biological Records Centre;
- The British Trust for Ornithology (BTO);
- Essex Field Club;
- Multi-Agency Geographic Information for the Countryside (MAGIC) website;
- National Biodiversity Network (NBN) Gateway website; and
- Relevant local wildlife groups/county recorders.

11.21 The desk study involved obtaining the following information (search radii from the DCO boundary are also provided):

- International statutory designations (15km);
- National statutory designations (5km);
- Non-statutory locally designated sites (2km);

- Annex II bat species⁴ records (6km); and
- All other protected/ notable species records (2km).

11.22 These search areas are considered sufficient to cover the potential zone of influence⁵ of the Proposed Development in relation to designated sites, habitats and species.

2020 Update Extended Phase 1 Habitat Survey

11.23 An update Extended Phase 1 Habitat survey was undertaken in late May 2020. The survey was completed in line with published methodology (JNCC, 2010⁶) to record broad habitats present across the Project Site. This type of survey does not compile a full botanical species list, or constitute a detailed botanical survey, but records dominant species and principal habitat types.

11.24 The survey has then be utilised to inform the need/scope for targeted detailed botanical survey across the Project Site.

2020 River Corridor/River Habitat Survey

11.25 In addition to the above, a River Corridor and River Habitat Survey of the River Ebbsfleet within the Project Site has been undertaken to characterise the physical and ecological features of the watercourse and thereby inform its conservation status. The survey has then been used to inform the scope of any further detailed surveys with respect to freshwater habitats and communities, specifically as a means of assessing current water quality.

2020 Update 'Phase 2' Ecology Surveys

11.26 To inform the EclA a full suite of update 'Phase 2' ecology surveys will be completed throughout 2020. The proposed scope, timings and methodologies to be employed for the detailed surveys is provided within the 'Summary of Terrestrial and Freshwater Ecology Survey Methodologies' report enclosed as **Appendix 11.24**. The precise scope of these detailed surveys is subject to consultation with Natural England, The Environment Agency, the local authority, and relevant consultees to this EIA Scoping Report.

11.27 All details relating to wintering bird surveys, completed in the 2019/2020 winter, are provided within the 'Wintering Bird Baseline Report' (see **Appendix 11.25**).

⁴ Bat species listed in Annex II of the *EC Habitats Directive*, namely Greater horseshoe, Lesser horseshoe, Barbastelle and Bechstein's bats

⁵ Zone of Influence - the area over which ecological features may be affected by biophysical changes as a result of the Proposed Development

⁶ Joint Nature Conservation Committee, (2010). Handbook for Phase 1 habitat survey: A Technique for Environmental Audit;

11.28 The majority of the update surveys are still to be completed, however for the purpose of this EIA Scoping Report the baseline conditions as known at the current time are provided below.

Baseline Conditions

Statutory Designations

11.29 Statutory designations represent the most significant ecological receptors, being of recognised importance at an international and/or national level. International designations include Special Protection Areas (SPAs), Special Areas of Conservation (SACs) and Ramsar Sites. National designations include Sites of Special Scientific Interest (SSSIs) and National Nature Reserves (NNRs).

11.30 Statutory designations occurring within the potential zone of influence of the Project Site are detailed below and illustrated in **Figure 11.2**.

International Designations (SPAs/SACs/Ramsar)

11.31 No part of the Project Site is covered by any international statutory designations. However, there are two statutory designations of international importance within 15km of the Project Site:

- Thames Estuary & Marshes SPA/Ramsar – located c.3.4km east of the Essex Project Site, and c.7km east of the Kent Project Site; and
- Medway Estuary and Marshes SPA/Ramsar – located c.13.4km south-east of the Essex Project Site, and c. 15.7km east of the Kent Project Site.

11.32 Both designations will be considered Important Ecological Features scoped into the EclA.

National Designations (SSSIs)

11.33 Within the Kent Project Site lies the Bakers Hole SSSI, designated for its geological interest. This SSSI will be scoped out of the EclA as its reasons for designation are not related to ecology.

11.34 In addition, within the potential zone of influence of the Project Site, there lies a further six statutory designations of national importance including:

- Darenth Woods SSSI;
- Medway Estuary and Marshes SSSI;
- Rainham Marshes SSSI;

- South Thames Estuary and Marshes SSSI;
- Swanscombe Skull Site SSSI and National Nature Reserve; and
- West Thurrock Lagoon and Marshes SSSI.

11.35 In their response to the 2014 Scoping report (Natural England ref: 137264, dated 04 December 2014), Natural England identified that the Proposed Development, which at the time did not include land within the Essex Project Site, has potential to indirectly impact on the above designated sites, which will be subsequently included within the EclA as Important Ecological Features (IEFs).

11.36 Following review of the additional SSSIs located within the potential zone of influence of the Essex Project Site, it is not considered that any of these designations would experience a potential adverse risk due to their geographical separation or lack of effect-receptor pathways.

Non-statutory Designations

11.37 Non-statutory designations are also commonly referred to in planning policies as ‘local sites’, although in fact these designations are typically considered to be important at a county level. In Kent, and Essex, such designations are referred to as Local Wildlife Sites (LWSs).

11.38 Additional designations which should be considered at this level include Local Nature Reserves (LNRs) and Ancient Semi-natural Woodland (ASNW) where these are not covered by other designations.

11.39 Within the Kent Project Site, there lies the Botany Marshes LWS. This LWS, along with 10 other LWSs that occur within a 2km radius of the Kent Project Site, are described in Table 11.3.

Table 11.3 Non-statutory designations within the potential zone of influence of the Kent Project Site

Local Wildlife Site Name	Location	Reason for Designation
Botany Marshes (GR19)	Designation fully within the Kent Project Site	This site is important owing to the presence of reedbed and the potential for ditch & grazing marsh restoration. Reedbed and grazing marsh are of principal importance in England. The site also supports three species of reptile, has water vole and otter signs and is of value to birds
Ebbsfleet Marshes, Northfleet (GR05)	Southern part of designation within the Kent Project Site	Ebbsfleet Marshes is designated for its range of habitats including reedbed, calcareous stream, lake, scrub, woodland, calcareous and neutral grassland. Protected species have been recorded within the designation including reptiles and great crested newts.

Local Wildlife Site Name	Location	Reason for Designation
Alkereden Lane Pit (DA13)	Adjacent to the north west of the Kent Project Site	The designation contains nationally scarce plants and contains the Kent's largest population of green-flowered helleborine (<i>Epipactis phyllanthes</i>). The designation also contains round leaved wintergreen (<i>Pyrola rotundifolia</i>). There are several species of nationally rare and scarce invertebrates within the designation.
Bluewater Quarry (DA1)	Adjacent to the western edge of the Kent Project Site	The walls of this huge pit display classic white Upper Chalk with prominent flint bands. The unconformity between the Chalk and the overlying Pleistocene sediments is irregular and the result of solution. Where solution has been most extreme these sediments 'pipe' down into the underlying Chalk.
Beacon Wood Country Park (DA10)	0.30km south	Designated for its fungi which is of county importance. The designation is a pit with cliffs and woodland fringes. The pit floor is damp but regularly dries out in the summer months. The designation supports a range of flora and fauna.
Disused Hospital Grounds, Mabledon (DA12)	1.45km south west	Designated for its chalk habitats including chalk grassland. The designation contains mixed scrub. The habitats within the designation support reptiles and lepidoptera.
Green Street Common (DA01)	1.5km south west	Designated for its acid grassland which supports four plant species that are of county or national importance. The designation also supports a range of lepidoptera species.
Canal and Grazing Marsh, Higham (GR17)	2.15km east	The site includes managed and unmanaged grazing marsh, dykes, sea wall, salt marsh and a long stretch of the Thames and Medway Canal. The site lies adjacent to the South Thames Estuary & Marshes Site of Special Scientific Interest (SSSI) and adds to the overall importance of this stretch of the North-West Kent Marshes.
Railway Cutting, Longfield (DA08)	2.45km south	A chalk cutting with thick hedgerows. Supports chalk grassland and associated plants.
Sutton-at-Hone Lakes (DA03)	2.70km south west	This is a section of the River Darent and contains areas of neutral grassland and scrub. The site supports a range of odonata, birds and bats.
Grassland and Scrub, Istead Rise (GR15)	3.0km south west	Designated for its chalk grassland. The designation also contains scrub and scrub woodland. The designation supports a varied bird assemblage including yellowhammer, cuckoo and common warbler.

11.40 Of those non-statutory designations described within the above table, it is considered that only those occurring within the DCO boundary or within its immediate surroundings will be at potential risk from the Proposed Development. On this basis, the following Local

Wildlife Sites will be scoped into the EclA as Important Ecological Features (IEFs) requiring further consideration:

- Botany Marshes LWS;
- Ebbsfleet Marshes, Northfleet LWS; and
- Alkerden Lane Pit LWS

11.41 The remaining non-statutory designations are not considered to be affected by the Proposed Development and have been scoped out of the EclA as an IEF owing to their spatial separation and/or lack of ecological connections with the Project Site. Bluewater Quarry LWS is scoped out of the EclA as its reasons for designation is due to its geological rather than ecological interest.

11.42 With regards to the Essex Project Site, there are no LWSs within the DCO boundary. However, there are three that lie within the site’s potential zone of influence, as detailed in Table 11.4.

Table 11.4 Non-statutory designations with the potential zone of influence of the Essex Project Site

Local Wildlife Site Name	Location	Reason for Designation
Th37. Tilbury Marshes LWS	Immediately to the east of the DCO boundary for the Essex Project Site	This Site comprises relict grazing-marsh, brackish ditches and the outer moats and grasslands of Tilbury Fort. Supports a diverse saltmarsh flora, with species such as Saltmarsh Rush (<i>Juncus gerardii</i>), Glassworts (<i>Salicornia spp.</i>), Sea Aster (<i>Aster tripolium</i>), Annual Seablite (<i>Suaeda maritima</i>) and the nationally scarce Stiff Saltmarsh-grass (<i>Puccinellia rupestris</i>) and Sea Barley (<i>Hordeum marinum</i>). The grazing land supports a good grazing-marsh flora, with many Nationally Scarce plants such as Divided Sedge (<i>Carex divisa</i>), Sea Barley, Slender Hare’s-ear (<i>Bupleurum tenuissimum</i>) grassland, with some Hairy Buttercup (<i>Ranunculus sardous</i>), Lady’s Bedstraw (<i>Galium verum</i>), Narrow-leaved Bird’s-foot Trefoil (<i>Lotus glaber [tenuis]</i>), Hard-grasses (<i>Parapholis sp.</i>) and Sea-spurreys (<i>Spergularia spp.</i>). The north-western section lies adjacent to the now-lost “Ferry Fields” grassland, an important invertebrate habitat destroyed by development, but some of the key species may survive on these remaining fragments of grassland. Selection Criteria: HCr16; HCr28?; SCr13
Th39. Lytag Brownfield (12.4ha) TQ 657764	c. 650m north-east	Survey work by independent ecological consultants has revealed populations of all four Essex reptiles (Adder, Grass Snake, Common

Local Wildlife Site Name	Location	Reason for Designation
		<p>Lizard and Slow-worm), making this one of the more important reptile sites in the borough. Their study also reveals an extensive developing acid grassland, which falls within the remit of the Essex heathland BAP project. Such brownfield sites are also likely to be of interest for their invertebrate populations, but no data is currently available at present. However, given the presence of UK BAP invertebrates on similar habitats around the Energy and Environment Centre (Th40), it is likely that an important fauna will be shown to be present here.</p> <p>Selection Criteria: HCr19; SCr4</p>
<p>Th40. Tilbury Centre (2.8 ha) TQ 658759</p>	<p>c.900m east</p>	<p>This Site comprises the grounds surrounding the Tilbury Energy and Environment centre. The habitats present are a complex mosaic of grassland, flower-rich early successional/pioneer vegetation, ditches, a small reedbed and a pond, notable for its colony of Stonewort (<i>Chara sp.</i>) and the nationally rare (Red Data Book) Great Silver Beetle (<i>Hydrophilus piceus</i>). The pioneer vegetation includes abundant Bird’s-foot Trefoil (<i>Lotus corniculatus</i>), on which the national BAP bumblebees (<i>Bombus humilis</i>) forages. Other important invertebrates have also been recorded here.</p> <p>Selection Criteria: HCr20; HCr22; SCr12</p>

11.43 Of those identified above, it is considered that only Tilbury Marshes LWS would be at potential risk from the Proposed Development, due to its proximity to development, and would therefore be scoped into the EclA as IEF requiring further consideration.

Water Quality

11.44 Of further pertinence to an EclA will be an assessment of surface water bodies, namely the River Ebsfleet to establish a baseline with respect to water quality and, thereby, inform the potential effects of the scheme on this feature. Typically, this will be support by a WFD compliance assessment, required for new developments to demonstrate that proposals will not result in a deterioration in the WFD status (or potential) of any waterbody or prevent the waterbody from meeting good status (or potential) in accordance with the requirements and objectives of the Water Framework Directive.

11.45 The River Ebbsfleet and Project Site is located within the Thames river basin district, the River Basin Management Plan (RMBP) for which identified the objectives and measures required to improve the status of surface and ground waterbodies within the catchment.

Although previously identified as a Heavily Modified Waterbody (HMWB) under the WFD until 2015, the River Ebbsfleet has since been de-classified and is no longer subject to assessment or management under the WFD with no subsequent classification of its current ecological potential. The overall classification for the River Ebbsfleet in 2009 was ‘moderate potential.’

- 11.46 Nevertheless, there remains the potential for water quality within the Ebbsfleet to be impacted by proposals as a result of increased surface water and discharge from the Project Site, such that further assessment of the watercourse is proposed. In this instance, an assessment of the River Ebbsfleet will be based on sampling of the aquatic invertebrate community as indicators of water quality and which will provide a standard measure of background pollution levels against which the efforts of any future compliance monitoring can be compared.
- 11.47 Although also considered indicators of water quality, no survey of the fish community is proposed given the identification of only a limited fish assemblage following surveys undertaken in 2015 (see **Appendix 11.22**) and poor availability of suitable habitat to sustain sustainable populations.

Habitats

- 11.48 As discussed above, an updated Extended Phase 1 Habitat Survey was completed in May 2020, which provides an up to date assessment of the current nature, distribution and condition of the habitats across the Project Site. The survey will also inform the need for detailed botanical assessment.
- 11.49 This is in addition to the completion of a River Corridor and River Habitat Survey of the Ebbsfleet to characterise the physical and ecological features of the watercourse and thereby inform its conservation status whilst also establishing a baseline with respect to an assessment of biological water quality.
- 11.50 The Essex Project Site comprises predominantly hardstanding, being occupied by a large area used for vehicle storage, and buildings associated with Tilbury Ferry Terminal. There are small linear areas of amenity grassland and scrub, adjacent to seasonally wet ditches, along the A1089 which traverses the western part of the Essex Project Site.
- 11.51 Based on the habitat surveys undertaken across the Kent Project Site previously, and the current Phase 1 habitat survey, the following broad description of habitats on the Kent Project Site, as extracted from the ‘*Phase 1 and Botanical Survey Report*’ prepared by Chris Blandford Associates in 2016 (**Appendix 11.8, available on request**) is considered sufficient to inform the current EIA Scoping request:

“The Proposed Development area supports a range of habitats including, intertidal sediment, saltmarsh, wetlands, including running water (the Ebbsfleet), open water (ponds), reedbed/swamp and ditch networks, a range of grasslands and early successional, arable, scrub, woodland, chalk cliffs/exposures, buildings and bare ground.”

The most valuable habitats and areas in terms of their broad nature conservation value are:

- *intertidal sediment;*
- *saltmarsh;*
- *reedbed and associated ditches;*
- *open water and ponds;*
- *more species and/or forb rich grasslands;*
- *early successional areas;*
- *coastal grazing marsh and associated ditches;*
- *marshy grassland;*
- *grassland, early successional and scrub mosaic;*
- *chalk exposures; and,*
- *the Ebbsfleet Corridor (including the river and associated wetland/riparian habitat)."*

11.52 In addition, the previous survey work has identified the following Nationally Scarce⁷ plant species and species listed on the Kent Rare Plant Register:

"Nine Nationally Scarce plant species were identified during the survey and an additional four Nationally Scarce species have been recorded by the Kent Botanical Recording Group since 2012, making a total of 13 Nationally Scarce species. The areas supporting the greatest concentration and largest populations of these species on the Swanscombe Peninsula are considered to be of County Importance for their plant species. In addition to the Nationally Scarce species seven other species listed in the Kent Rare Plant Register were recorded.

The saltmarsh, reedbed and ponds P3, P4 and P5 are considered to be of County Importance. The more species and forb rich areas of grassland and early successional vegetation, including those supporting Nationally Scarce and Kent Rare Plant Register species, are considered to be of Local Importance. Most other habitats are considered to be of Parish Importance."

⁷ Defined within the 'Phase 1 and Botanical Survey Report' prepared by Chris Blandford Associates in 2016 as those species included in the Kent Red Data Book and Kent Rare Plant Register

11.53 The 2020 updated desk study has also returned records of the following plants listed in Schedule 8 ('plants which are protected' of the Wildlife and Countryside Act 1981 (as amended): wild gladiolus (*Gladiolus illyricus*), bluebell (*Hyacinthoides non-scripta*), ground pine (*Ajuga chamaepitys*), pennyroyal (*Mentha pulegium*), jersey cudweed (*Gnaphalium luteoalbum*) and field eryngo (*Eryngium campestre*).

Species

11.54 As discussed above, a full suite of update ecology surveys across the Project Site, as detailed in **Appendix 11.24**, is underway, the findings of which will be used to inform the EIA.

11.55 For the purpose of this EIA Scoping Report, a summary of the previous survey findings and 2020 desk study records for protected and notable species is provided in **Appendix 11.23**.

11.56 For those update surveys completed to date the results are presented below.

Wintering Birds

11.57 The findings of the wintering bird surveys undertaken throughout the 2019/2020 winter are provided in **Appendix 11.25**.

Breeding Birds

11.58 Breeding bird surveys are currently being undertaken, including surveys in April, May and June 2020.

11.59 The preliminary findings of the April survey are provided below. At the time of writing, survey results from May are still being collated and analysed.

- Swanscombe Peninsula:
 - Blackduck marsh - Schedule 1 species include 1 pair Marsh Harrier, 2-3 pairs of Bearded Tit and c.5-10 pairs Cetti's Warbler. Red listed species include Common Pochard 5-10 pairs and 2-3 pairs of Linnet (these appear to be breeding around the edges in the bushes);
 - Scrubland at the north end (the point) - Schedule 1 species include 2-3 pairs Cetti's Warbler. Red listed species include 6 pairs Grasshopper Warbler;
 - Old sewage farm area - Schedule 1 species 1-2 pairs Bearded Tit, and 4-6 pairs Cetti's Warbler;
 - Scrub on east side by industrial area - Schedule 1 species include 4-6 pairs Cetti's Warbler. Red listed species include 2-4 pair Song Thrush, and 1 pair Nightingale;

- General (no specific area) - Schedule 1 species include 20-30 pairs Cetti's Warbler with pairs no further than 100m apart including on the scrub on top of the old landfill. Red listed species include 1 pair Cuckoo in the scrub singing in the west side of the peninsula; Skylark, 4-6 pairs on various small patches of grassland but no specific concentration; Song Thrush, 10 pairs across the peninsula in lots of the scrub; mistle thrush, 1 pair nesting by the security hut; Grey Wagtail, 1 pair nesting near the security hut; Grasshopper Warbler, 8+ pairs across the peninsula including the above mentioned pairs, and Linnet, 10+ pairs across the peninsula in most sections of scrub; and
- Large pylon at north end of peninsula - probable pair of Peregrine on the large pylon.
- Bamber Pit:
 - Schedule 1 species include 3 pairs Cetti's Warbler. Red listed species include 2+ pairs Song Thrush and 1 pair Nightingale.
- Former landfill:
 - Red listed species include 1+ pair skylark, 2+ pair Song Thrush.
- Ebbsfleet International Station car parks:
 - Red listed species include 1+ pair Skylark, 2 pair Song Thrush and 2+ pair Linnet.
- Station Quarter South:
 - Schedule 1 species include 2 pairs Cetti's Warbler. Red listed species include 2 pairs Linnet.

Dormice

11.60 As described within the 'Summary of Terrestrial and Freshwater Ecology Survey Methodologies' report enclosed as **Appendix 11.24**, nest tube surveys for dormice are being undertaken throughout the Kent Project Site in 2020. No surveys will be undertaken in the Essex Project Site due to lack of suitable habitat.

11.61 During the deployment of dormouse nest tubes within the south-eastern corner of the former landfill within the Ebbsfleet Valley, three sub-adult dormice were recorded within an old nest tube, thereby confirming the presence of the species within the Kent Project Site. The location of the record is shown on the 'Dormouse Tube Locations' plan enclosed within **Appendix 11.23**.

Great Crested Newts

- 11.62 As described within the Summary of Terrestrial and Freshwater Ecology Survey Methodologies' report enclosed as **Appendix 11.24** surveys to confirm the presence/likely absence of great crested newts have been undertaken in April 2020. The survey comprised the collation of water samples for subsequent testing for the presence of great crested newt environmental DNA (eDNA) across a number of ponds/ditches across the Kent and Essex Project Site where access was possible (see **Appendix 11.26**)
- 11.63 The eDNA results, provided in full in **Appendix 11.26**, have confirmed a 'negative' result, i.e. that no great crested newt eDNA has been detected in any of the waterbodies sampled.
- 11.64 On this basis it is considered that great crested newts are highly unlikely to be present and no further survey work will be undertaken.

Scope of Assessment – Selection of Important Ecological Features

- 11.65 Provisionally, based on the existing baseline information summarised above, and subject to the findings of detailed survey work being undertaken throughout 2020, the following are likely to be considered the 'Important Ecological Features' (IEFs) which will be the subject of an assessment of significant effects presented in the ES:

Statutory Designations

- Thames Estuary & Marshes SPA/Ramsar;
- Medway Estuary and Marshes SPA/Ramsar/SSSI;
- Darenth Woods SSSI;
- Rainham Marshes SSSI;
- South Thames Estuary and Marshes SSSI;
- Swanscombe Skull Site SSSI and National Nature Reserve; and
- West Thurrock Lagoon and Marshes SSSI.

Non-statutory Designations

- Botany Marshes LWS;
- Ebbsfleet Marshes, Northfleet LWS;

- Alkerden Lane Pit LWS; and
- Tilbury Marshes LWS.

Habitats and Flora

- Coastal saltmarsh;
- Reedbed;
- Open water, ditches and ponds;
- Species-rich grassland;
- Coastal grazing marsh;
- Marshy grassland;
- *The Ebbsfleet Corridor (and associated aquatic communities); and*
- Rare plants.

Species

- Wintering bird assemblage;
- Breeding bird assemblage;
- Foraging and commuting bats;
- Roosting bats;
- Dormice;
- Harvest mouse;
- Water vole;
- Otter;
- Amphibians;
- Reptiles;
- Terrestrial invertebrates; and

- Aquatic invertebrates.

11.66 The species not currently considered to be IEFs include:

- Badger;
- Hedgehog;
- Stoat; and
- Weasel.

11.67 Although not IEFs which would be subject to an assessment of significant effects, it is recognised that any pertinent legal protection (e.g. to badgers under the Protection of Badgers Act, 1992) associated with these non-IEFs will also be covered within the ES for completeness.

Future Baseline Conditions

11.68 The CIEEM (2018) guidelines on Ecological Impact Assessment⁸ explain that predicting the future baseline of the site should take into account environmental trends such as climate change, particularly in regard to species on the edge of their natural range, where their distribution is changing as a result of changes in climate (i.e. increase in winter and summer mean and mean daily maximum/ minimum temperatures, an increase in winter mean precipitation and a decrease in summer mean precipitation).

11.69 The EcIA will, therefore, use the latest climate models to consider the potential impacts of climate change on the predicated future baseline.

PRELIMINARY ASSESSMENT OF POTENTIAL EFFECTS

11.70 The assessment of likely potential effects considers those construction activities related to the Project, as well as those related to its operation.

11.71 Without mitigation, the potential effects of the Proposed Development during the construction phase on the IEFs identified above are described below:

- Direct habitat loss, damage or degradation;
- Habitat fragmentation/loss of flight paths/dispersal routes;

⁸ CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine version 1.1. Chartered Institute of Ecology and Environmental Management, Winchester.

- Habitat disturbance;
- Killing, injuring and disturbance of wild animals;
- Increased collision risk to birds and bats;
- Increased dust, and noise, vibration, visual and light disturbance;
- Hydrological effects, including changes to water quality/quantity;
- Pollution/contamination incidents; and
- Spread of invasive species.

11.72 Without mitigation, the potential effects of the Proposed Development on the IEFs identified above during the operational phase could include:

- Habitat fragmentation/ loss of flight paths/ dispersal routes;
- Increased lighting, noise and traffic leading to disturbance of species within retained and newly created habitats;
- Increased collision risk to birds and bats;
- Hydrological effects, including changes to water quality/ quantity; and
- Damage or degradation to habitats and disturbance of wildlife through increased recreational pressure and trampling; and
- Potential positive benefit through provision of habitats with greater biodiversity value than those currently present, and implementation of appropriate management of the retained and created habitats to maximise their biodiversity potential.

APPROACH AND METHODOLOGY

Ecological Impact Assessment

11.73 The EclA will follow the methodology provided in the ‘*Guidelines for Ecological Impact Assessment in the UK and Ireland*’, produced by the Chartered Institute of Ecology and Environmental Management (CIEEM) (2018)⁹. The Guidelines confirm that the “EclA is a

⁹ CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine version 1.1 – updated September 2019. Chartered Institute of Ecology and Environmental Management, Winchester.

process of identifying, quantifying and evaluating the potential effects of development-related or other proposed actions on habitats, species and ecosystems”.

Identification of the Resource/Baseline Conditions

11.74 The results of the desk study, Phase 1 habitat survey, and further detailed surveys as described previously will be used to identify the ecological receptors (IEFs) within the Project Site and its potential zone of influence. This baseline will then be used to inform the master-planning and mitigation strategy, and form the basis for the assessment of potential effects.

Geographical Context

11.75 CIEEM guidelines recommend that the importance of an ecological feature should be considered according to a defined geographical context and recommends that the following frame of reference should be used, or adapted to suit local circumstances:

- International and European;
- National;
- Regional; and
- Metropolitan, county, Vice-county or other local authority-wide area.

Assessment of Effects and Significance Criteria

11.76 The assessment of effects will consider potential effects during the construction of the Proposed Development, and throughout the operational and decommissioning phases of the works. The assessment will be undertaken both before and after consideration of additional mitigation measures, the latter represents the assessment of residual effects, but including the inherent measures incorporated into the proposals e.g. retention of habitats. In addition, the potential for cumulative impacts to arise from the in-combination effects with other development proposals will be assessed.

11.77 Since the purpose of an EIA is to focus on likely significant effects, it is not reasonable to expect the assessment to include every ecological feature that may be affected, since effects are unlikely to be significant where features of low value (i.e. valued at the Site level or below) or sensitivity are, for example, subject to low or short-term impacts. On this basis therefore, the assessment will focus on ecological features that are considered, based on professional judgement, experience and contextual information, to be protected and/or of local nature conservation value or above.

11.78 This does not mean that effects upon features of less than local level nature conservation value will be discounted. Certain species and habitats that may not constitute IEFs based upon their nature conservation value, may still warrant consideration during the design of

the development (and any mitigation identified) on the basis of their legal protection, their implications for policies and plans, or other issues, such as animal welfare.

- 11.79 In accordance with the CIEEM published guidance and terminology (CIEEM 2018), a 'significant effect', in ecological terms, is defined as an effect that either supports or undermines biodiversity conservation objectives for 'important ecological features' or for biodiversity in general. Conservation objectives may be specific, broad, or more wide-ranging, and can be considered at a range of geographical scales, including cumulative effects. Insignificant effects are those that would not result in such changes.
- 11.80 Once any impacts have been assessed and defined using the geographical frame of reference advocated by CIEEM, using professional judgement each impact will be transposed into the standard terminology used throughout the ES.
- 11.81 Mitigation will be devised to avoid any significant impacts associated with the construction and operation of the Proposed Development on ecological features. Any other mitigation or enhancement considered appropriate would also be set out. Once the appropriate mitigation measures have been proposed, the impacts remaining once they are taken into account will be identified (the 'residual impact').

Temporal Scope

- 11.82 The assessment of potential ecological effects resulting from the development proposals will be undertaken in the context of how the predicted baseline conditions within the zone of influence might change between the surveys and the start of construction activities.

Habitats Regulations Assessment – Report to Inform Assessment

- 11.83 There is the potential that the development could have a significant effect on internationally designated sites, including the Thames Estuary & Marshes SPA/Ramsar and the Medway Estuary and Marshes SPA/Ramsar/SSSI and will therefore require assessment at the 'project level' under the Habitats Regulations. As such a Habitat Regulations Assessment (HRA) report will be produced which will provide information to support a HRA, to be completed by the competent authority. The HRA will include information on the designated interest features of the above sites, as appropriate.
- 11.84 The HRA will include a 'screening' assessment to determine if any Likely Significant Effects (LSEs) are likely to arise (either alone or in combination with other plans or projects). Where LSEs cannot be screened out information to inform an Appropriate Assessment (AA), completed by the competent authority, will be provided.

WFD Assessment

- 11.85 As part of a scoping exercise, the Environment Agency will be consulted to confirm the requirement for a WFD assessment in respect of the potential for impacts to arise upon

the River Ebbsfleet. Although previously identified as a Heavily Modified Waterbody under the WFD until 2015, it has since been de-classified and no longer subject to assessment or management under the WFD with no subsequent classification of its current ecological potential. The overall classification for the River Ebbsfleet in 2009 was 'moderate potential.'

11.86 Nevertheless, the River Ebbsfleet discharges into the tidal Thames such that further assessment may likely be required to determine whether there is a risk of deterioration on the historical status of the River Ebbsfleet due to the Project.

PROPOSED AVOIDANCE AND MITIGATION MEASURES

11.87 The EclA will include mitigation measures designed to avoid, reduce or offset any potential significant negative effects left following consideration of inherent mitigation incorporated into the proposals.

11.88 The key mechanisms to deliver mitigation will include measures to:

- Conform with relevant and pertinent legislative requirements, particular those associated with legally protected species; and
- Deliver and, where possible, maximise opportunities for biodiversity enhancement and gain through the Proposed Development.

11.89 The mitigation strategy will be developed in full following completion of further technical work to establish the ecology baseline and in response to consultee comments. However, provisionally, the proposed mitigation measures to be deployed through the construction phases could include:

- Implementation of an Ecological Construction Method Statement (ECMS), to include (but not limited to):
 - Provision of an Ecological Clerk of Works (ECoW) to supervise construction activities in sensitive areas for habitats and species;
 - Provision of 'toolbox talks' to key site workers;
 - Method statements for the delivery of works in sensitive areas, including controls over timing/ duration of works to avoid sensitive times of year (e.g. the bird breeding season);
 - Precautionary methods of working and sensitive vegetation/site clearance (under a European Protected Species where necessary), e.g. 'soft-felling' trees with bat roost potential or removal of suitable dormouse habitat;

- Translocation of protected species prior to construction works commencing (under a European Protected Species where necessary);
- Restricted working hours and sensitive lighting strategy to minimise impacts on nocturnal wildlife;
- Establishment of Ecological Protection Zones (EPZs), through use of protective fencing, to prevent construction activities damaging retained habitats;
- Update ecology surveys prior to commencement of works;
- Prevention of hydrological impacts through adherence to an appropriate Surface Water Management Strategy; and
- Pollution prevention guidelines.

11.90 Throughout the operational phase, provisionally, mitigation and enhancement measures are likely to be secured through the following:

- Implementation of a Landscape and Ecology Management Plan (LEMP), to include (but not limited to):
 - Prescriptions for the ongoing management, maintenance and monitoring of the IEFs and of those newly created habitats to maximise opportunities for biodiversity enhancement and gain;
 - Management of open spaces for biodiversity, with controlled/restricted recreational use within sensitive areas;
 - Objectives and principles for the long-term management of ecology interests; and
 - Compliance checks and monitoring to ensure the success of the implemented measures against the objectives and principles, with interventions carried out as necessary.

UNCERTAINTIES

11.91 At this stage there are a number of project design options under consideration. Some of these options may change the scope of the ecology and biodiversity assessment but this is unlikely to be a significant change.

MATTERS TO BE SCOPED OUT

- 11.92 Based on survey information gathered in 2015 (as summarised in **Appendices 11.21 and 12.22, available on request**), which recorded very few fish species within the Thames Estuary, Swanscombe Marshes, and the Ebbsfleet Stream, it is considered that any effects of the Proposed Development on fish populations potentially present are unlikely to be significant, in EIA terms. Effects on this receptor have therefore been scoped out of the assessment.
- 11.93 Although effects on fish populations are unlikely to be significant, a scoping exercise has also considered the survey and assessment of a local fish population as an indicator of water quality within the River Ebbsfleet. However, survey effort undertaken during 2015 identified a limited fish assemblage constrained by the highly modified nature of the River Ebbsfleet and barriers to migration with subsequent with poor availability of suitable habitat. Populations are thus constrained by the availability of suitable habitat rather than water quality and are unlikely to provide a robust indicator of water quality within the River Ebbsfleet. As such, no further fish surveys are to be undertaken.

SUMMARY

- 11.94 The Project Site is not covered by any statutory designated sites for nature conservation and although there are some designated sites within the potential zone of influence, these will be fully considered and appropriately safeguarded during the design process with any impacts appropriately mitigated or compensated for.
- 11.95 There are a number of non-statutory designated sites that are within and adjacent to the Kent Project Site that will be carefully considered in the assessment and appropriate avoidance, enhancement or mitigation provided to ensure no residual impacts from the scheme.
- 11.96 There is the potential for loss and damage of protected or important habitats and species as a result of the proposals that will be fully assessed as part of the EclA. These will be avoided or mitigated through the design process to ensure that the proposals fully comply with legislation and both national and local planning policy requirements.
- 11.97 Opportunities exist to improve and enhance the ecological network within the Kent Project Site through recreation of wetland and riparian habitats, returning the area to its former use.



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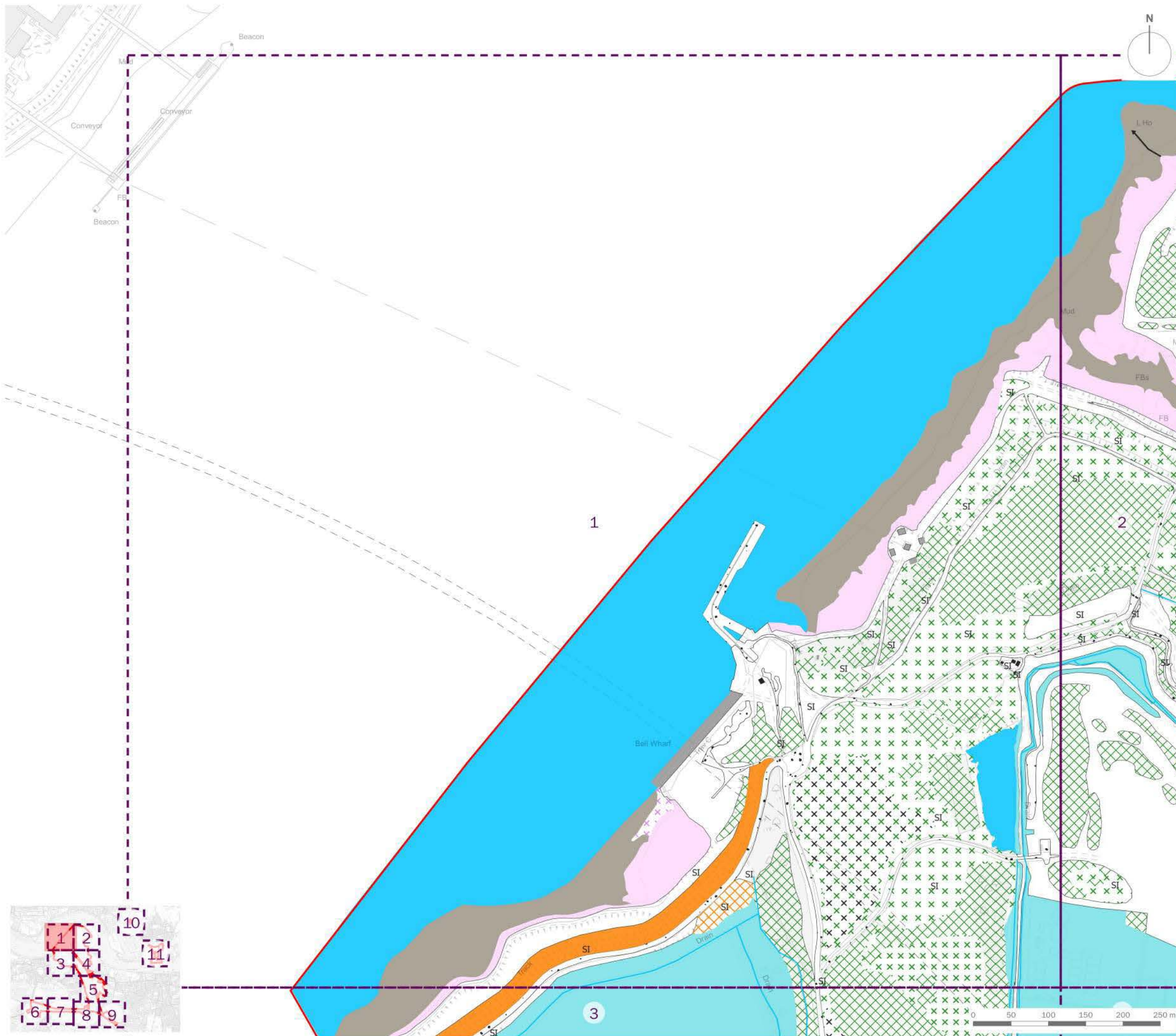
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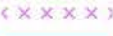


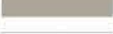





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Figure 11.1: Phase 1 Habitat Plan

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-  Site Boundary
-  Broadleaved Semi-natural Woodland
-  Broadleaved Plantation Woodland
-  Dense Continuous Scrub
-  Scattered Scrub
-  Tall Ruderal
- A** Arable
- I** Improved Grassland
-  Poor Semi-improved Grassland
-  Semi-improved Neutral Grassland
-  Semi-improved Calcareous Grassland
-  Matrix of Poor SI Grassland and Scattered Scrub
-  Matrix of Poor SI Grassland and Tall Ruderal
-  Matrix of Semi-improved Calcareous Grassland and Scattered Scrub
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-  Amenity Shrub Planting
-  Marshy Grassland
-  Saltmarsh
-  Scattered Saltmarsh Vegetation
-  Standing Water
-  Swamp
-  Mud
-  Bare Ground
-  Hardstanding
-  Building
-  River Ebbsfleet
-  Ditch

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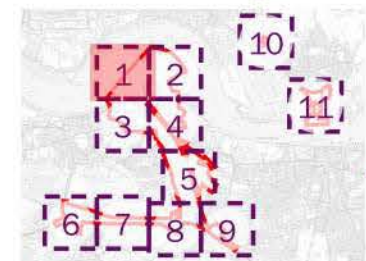
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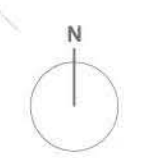
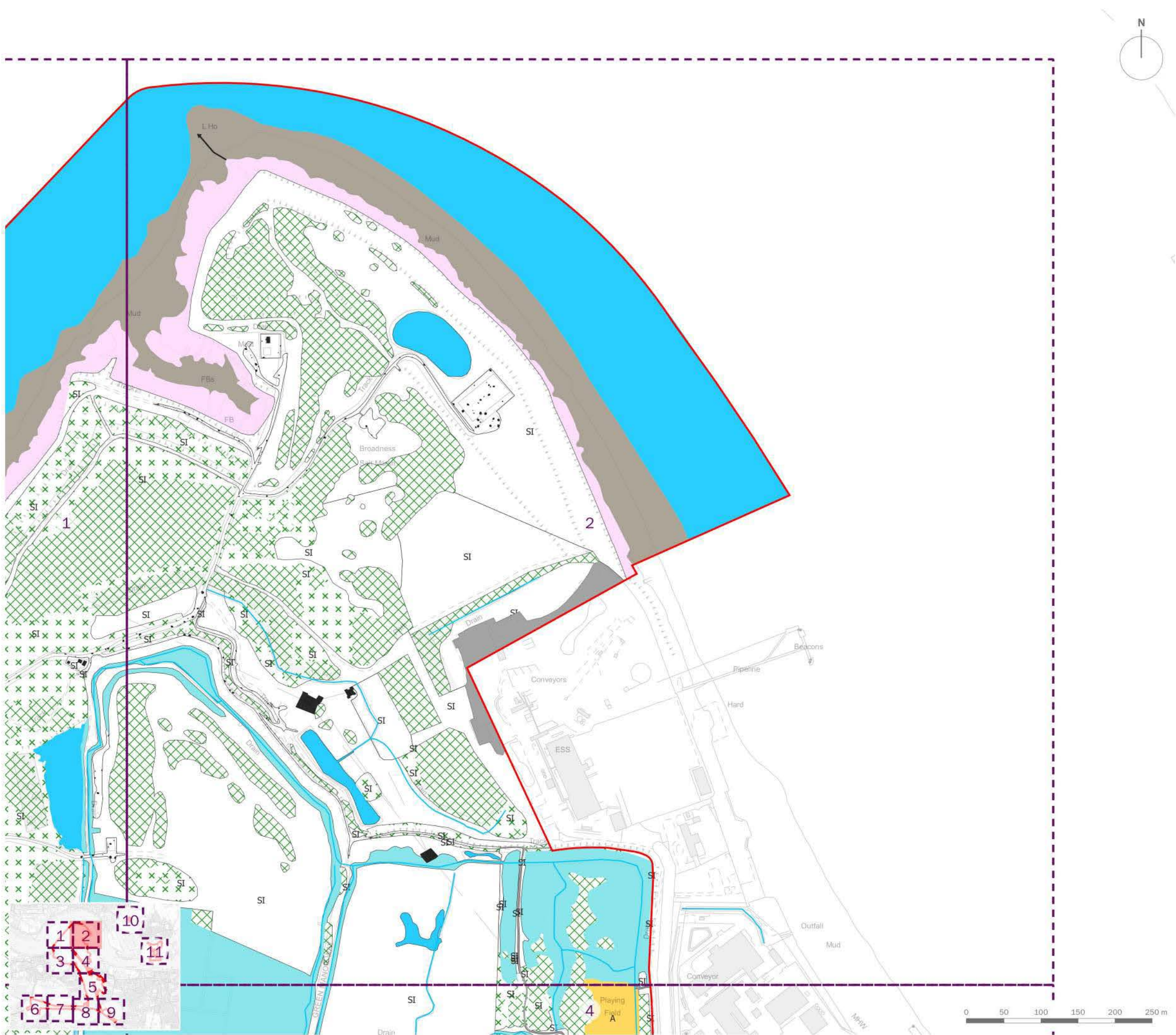
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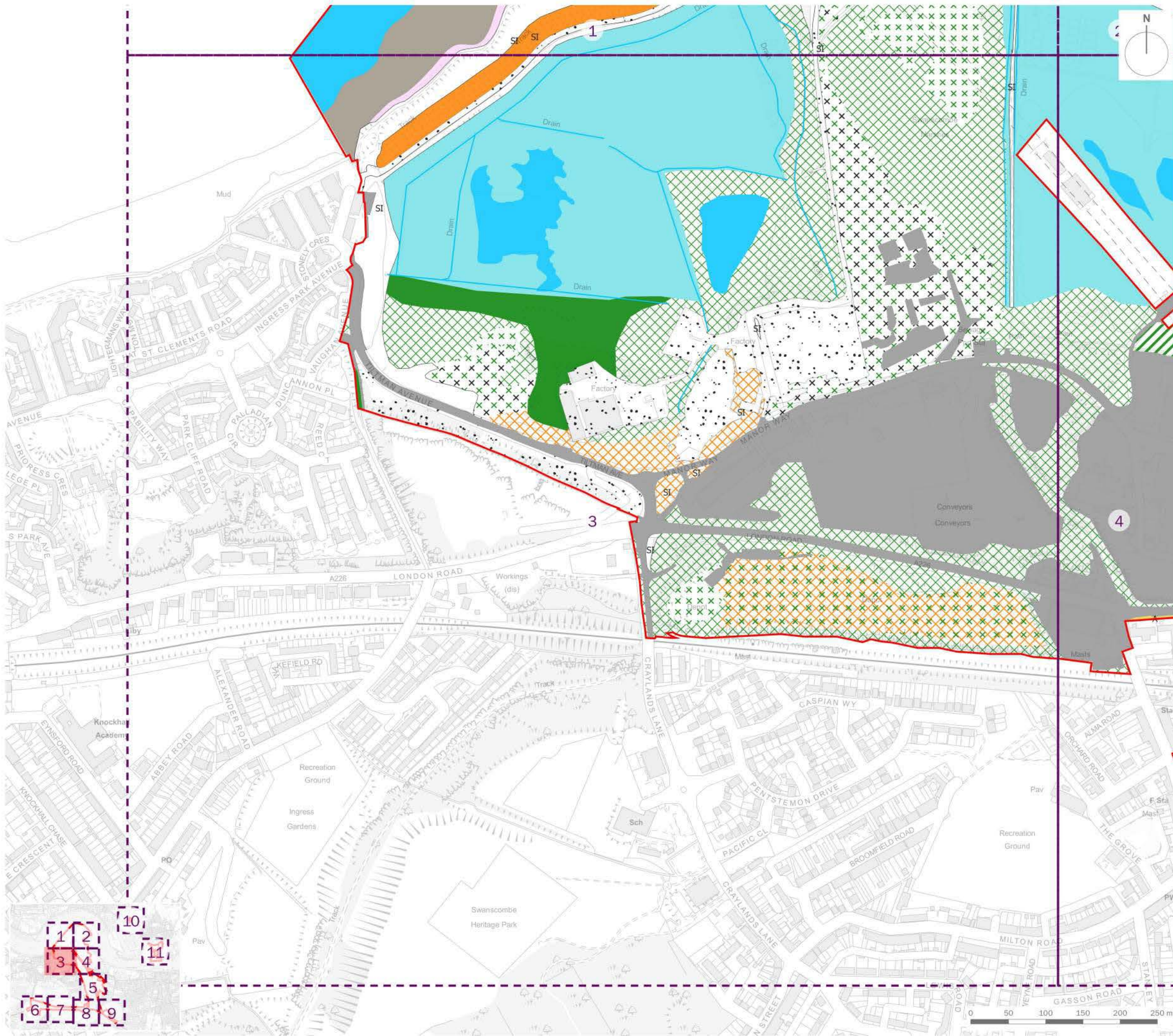
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










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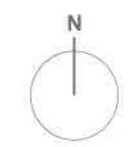
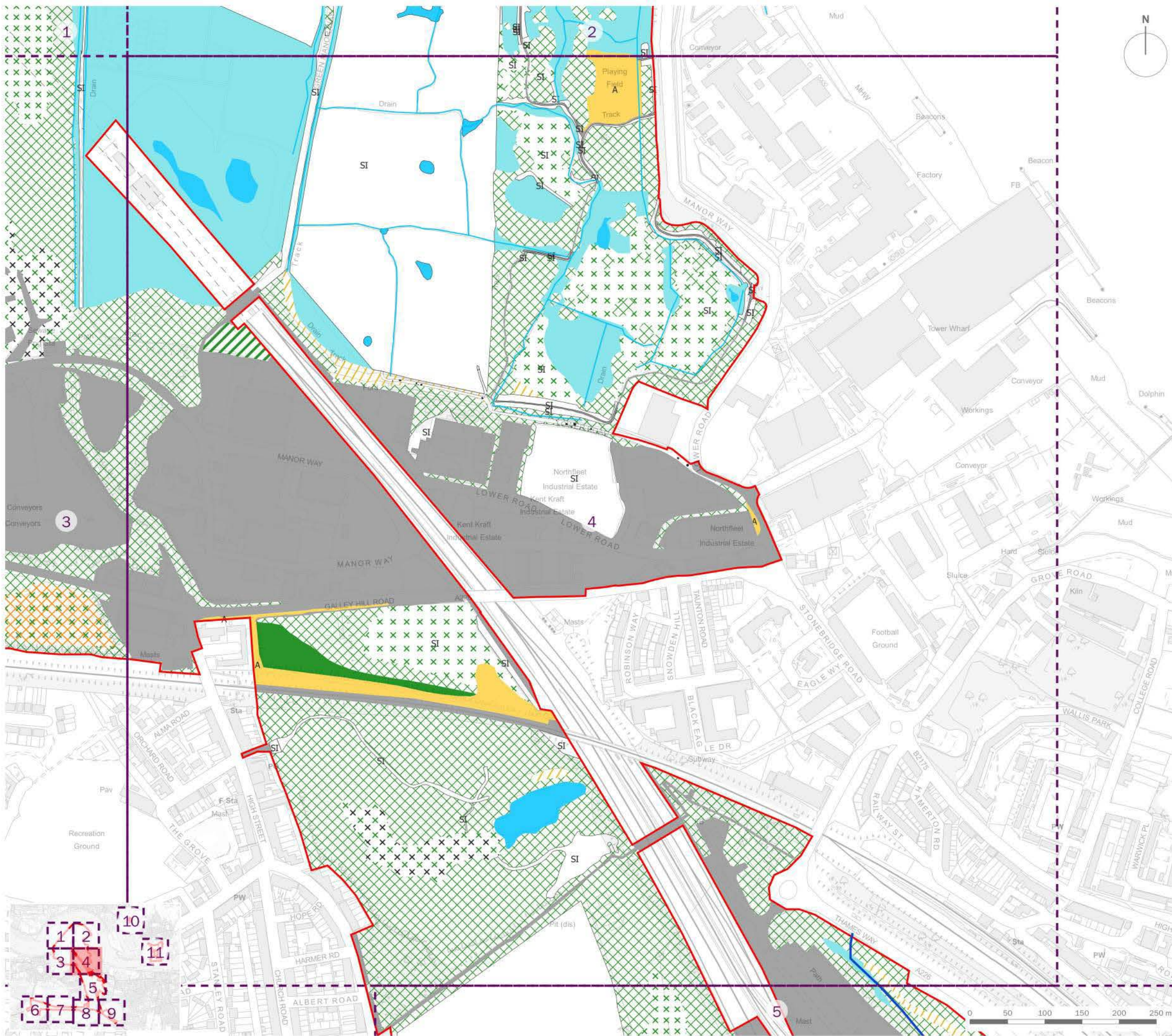
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Figure 11.1: Phase 1 Habitat Plan (Sheet 3 of 11)

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Figure 11.1: Phase 1 Habitat Plan (Sheet 4 of 11)

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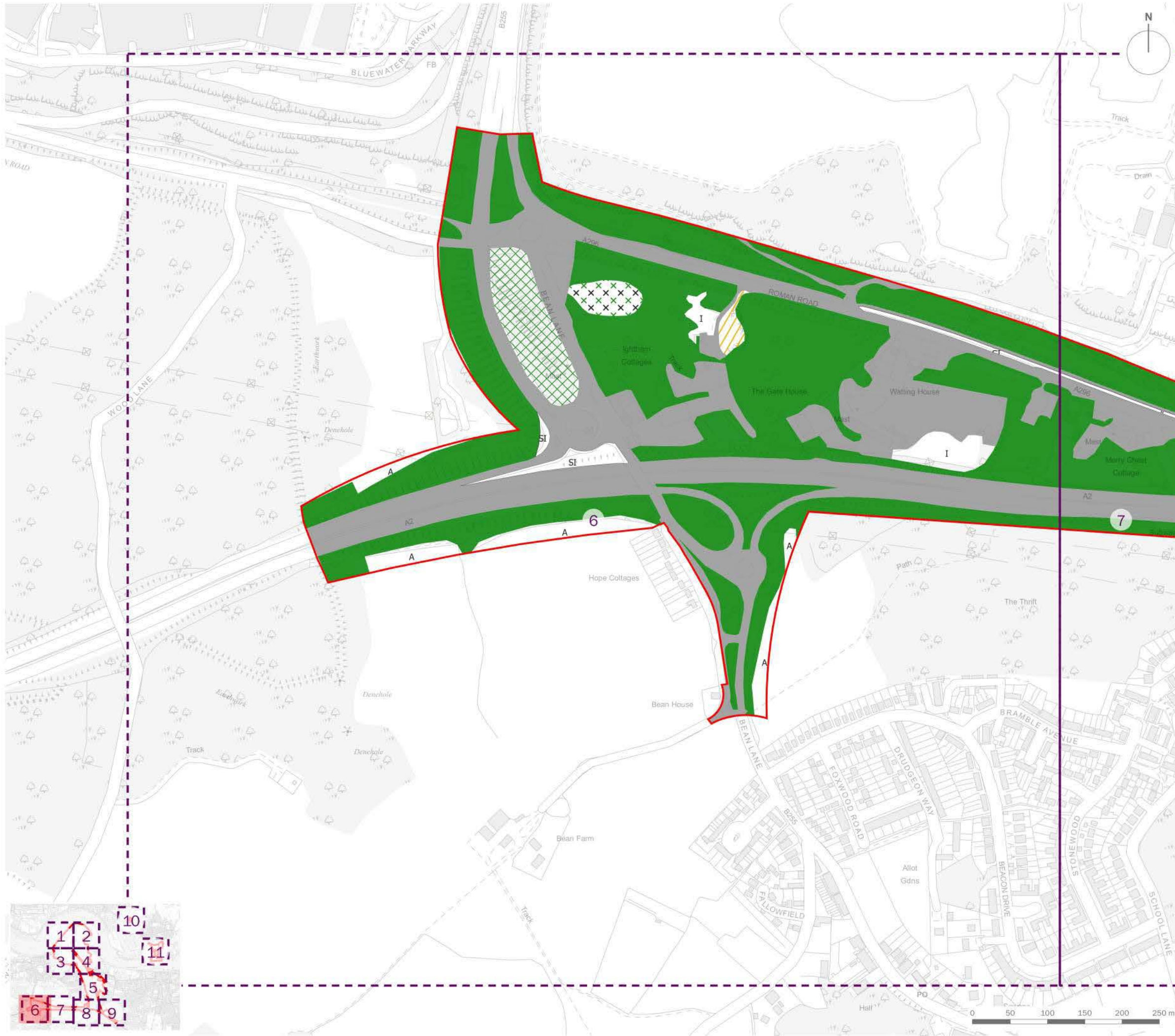
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Figure 11.1: Phase 1 Habitat Plan (Sheet 5 of 11)

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Figure 11.1: Phase 1 Habitat Plan (Sheet 6 of 11)

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- Broadleaved Plantation Woodland
- Dense Continuous Scrub
- Scattered Scrub
- Tall Ruderal
- A Arable
- I Improved Grassland
- SI Poor Semi-improved Grassland
- SI Semi-improved Neutral Grassland
- SI Semi-improved Calcareous Grassland
- Matrix of Poor SI Grassland and Scattered Scrub
- Matrix of Poor SI Grassland and Tall Ruderal
- Matrix of Semi-improved Calcareous Grassland and Scattered Scrub
- Open Mosaic Habitats on Previously Developed Land
- A Amenity Grassland
- Amenity Shrub Planting
- Marshy Grassland
- Saltmarsh
- Scattered Saltmarsh Vegetation
- Standing Water
- Swamp
- Mud
- Bare Ground
- Hardstanding
- Building
- River Ebbsfleet
- Ditch















client
The London Resort Company Holdings Ltd

project title
The London Resort

drawing title
Figure 11.1: Phase 1 Habitat Plan (Sheet 7 of 11)

date	09 JUNE 2020	drawn by	GY
drawing number	edp5988_d047	checked	JB
scale	1:5,000 @ A3	QA	JTF



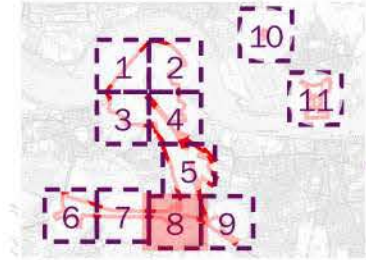
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-  Poor Semi-improved Grassland
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-  Semi-improved Calcareous Grassland
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Figure 11.1: Phase 1 Habitat Plan (Sheet 8 of 11)

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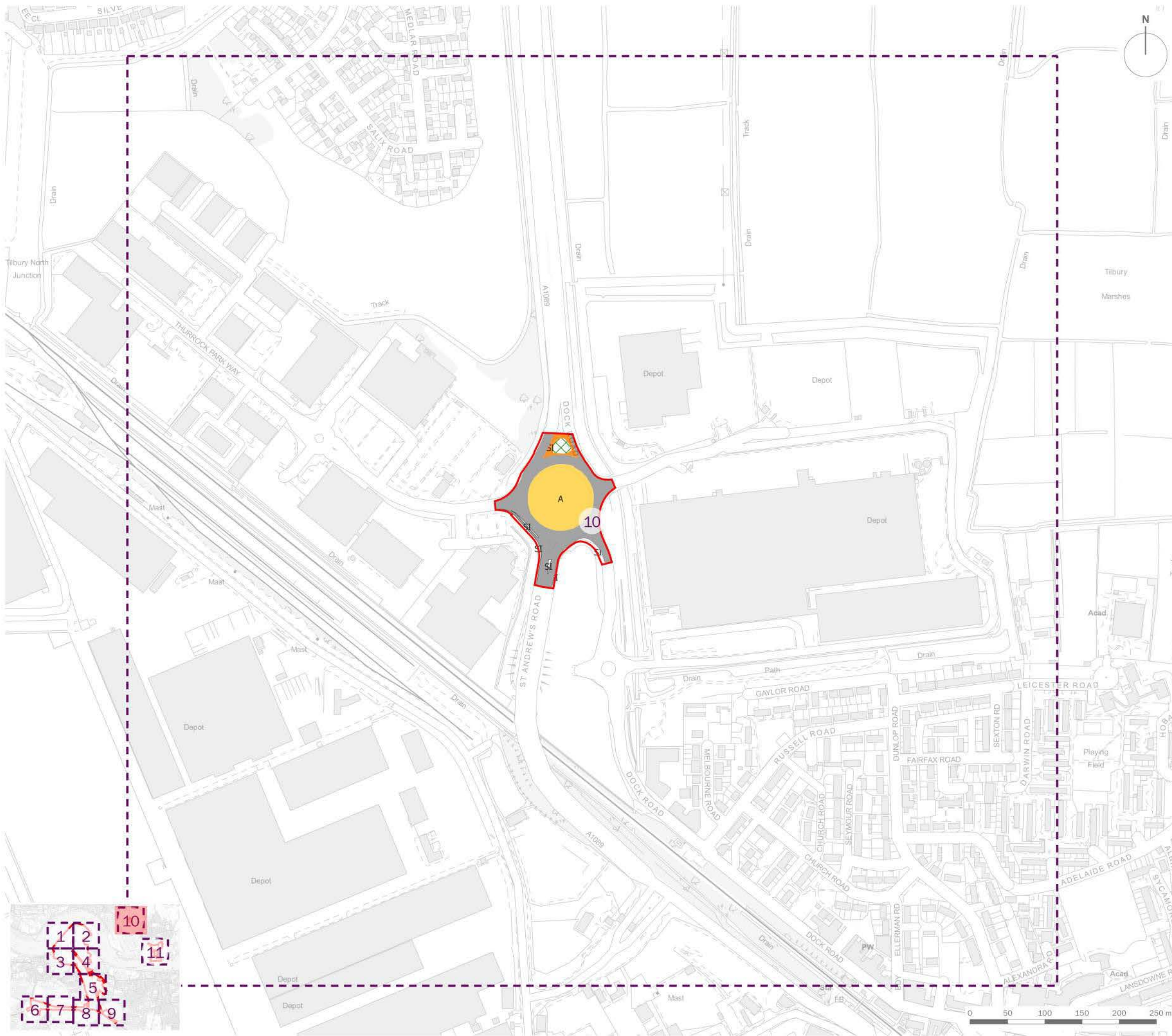
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project title
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drawing title
Figure 11.1: Phase 1 Habitat Plan (Sheet 9 of 11)

date 09 JUNE 2020 drawn by GY
drawing number edp5988_d047 checked JB
scale 1:5,000 @ A3 QA JTF



- Site Boundary
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- Broadleaved Plantation Woodland
- Dense Continuous Scrub
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client
The London Resort Company Holdings Ltd

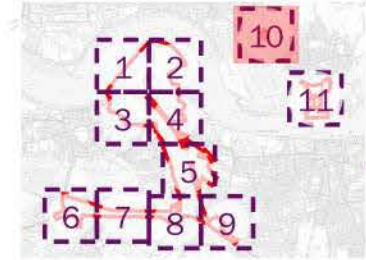
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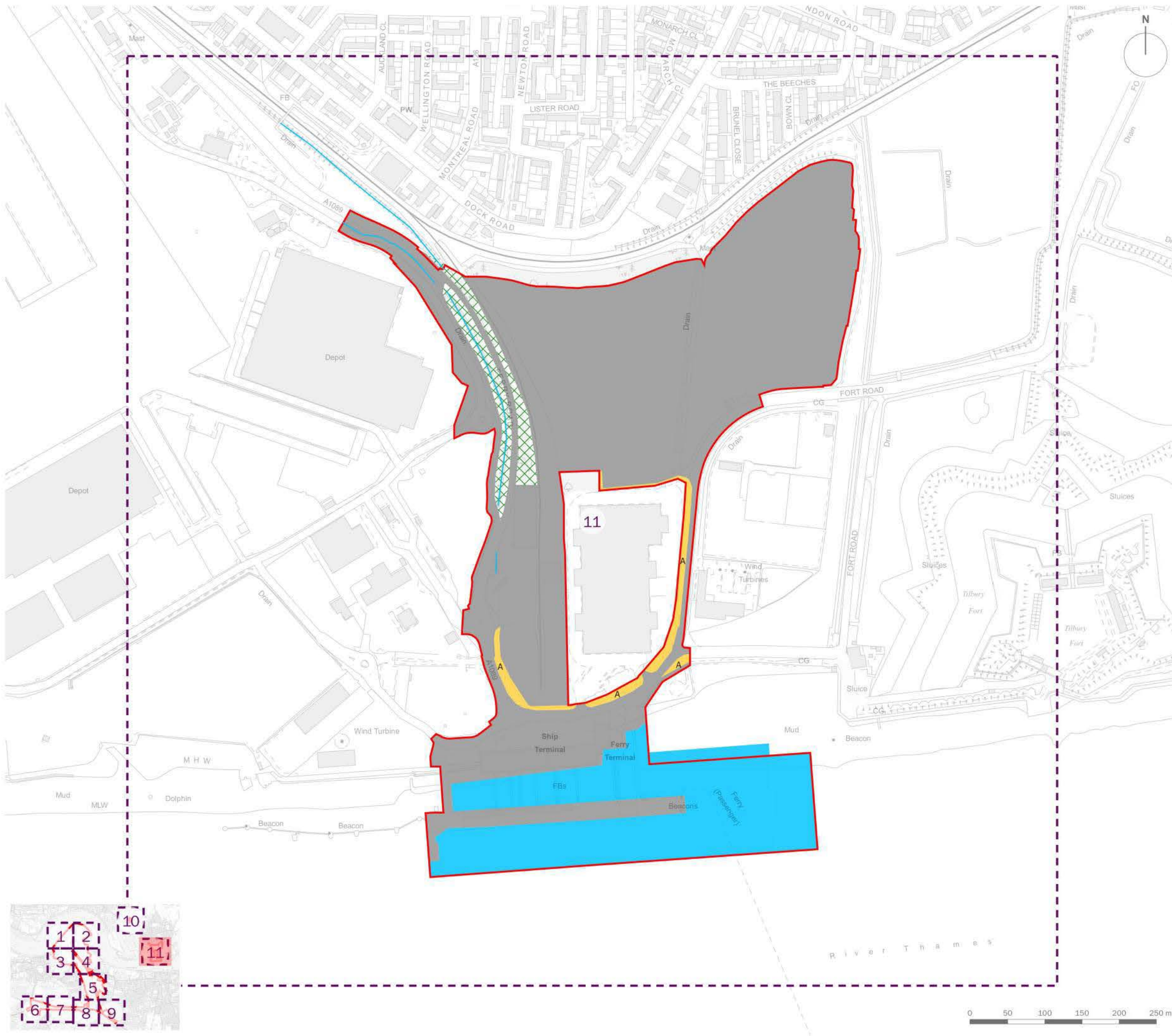
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Figure 11.1: Phase 1 Habitat Plan (Sheet 10 of 11)

date	09 JUNE 2020	drawn by	GY
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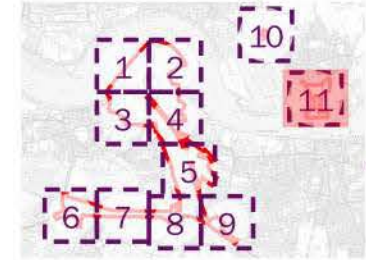
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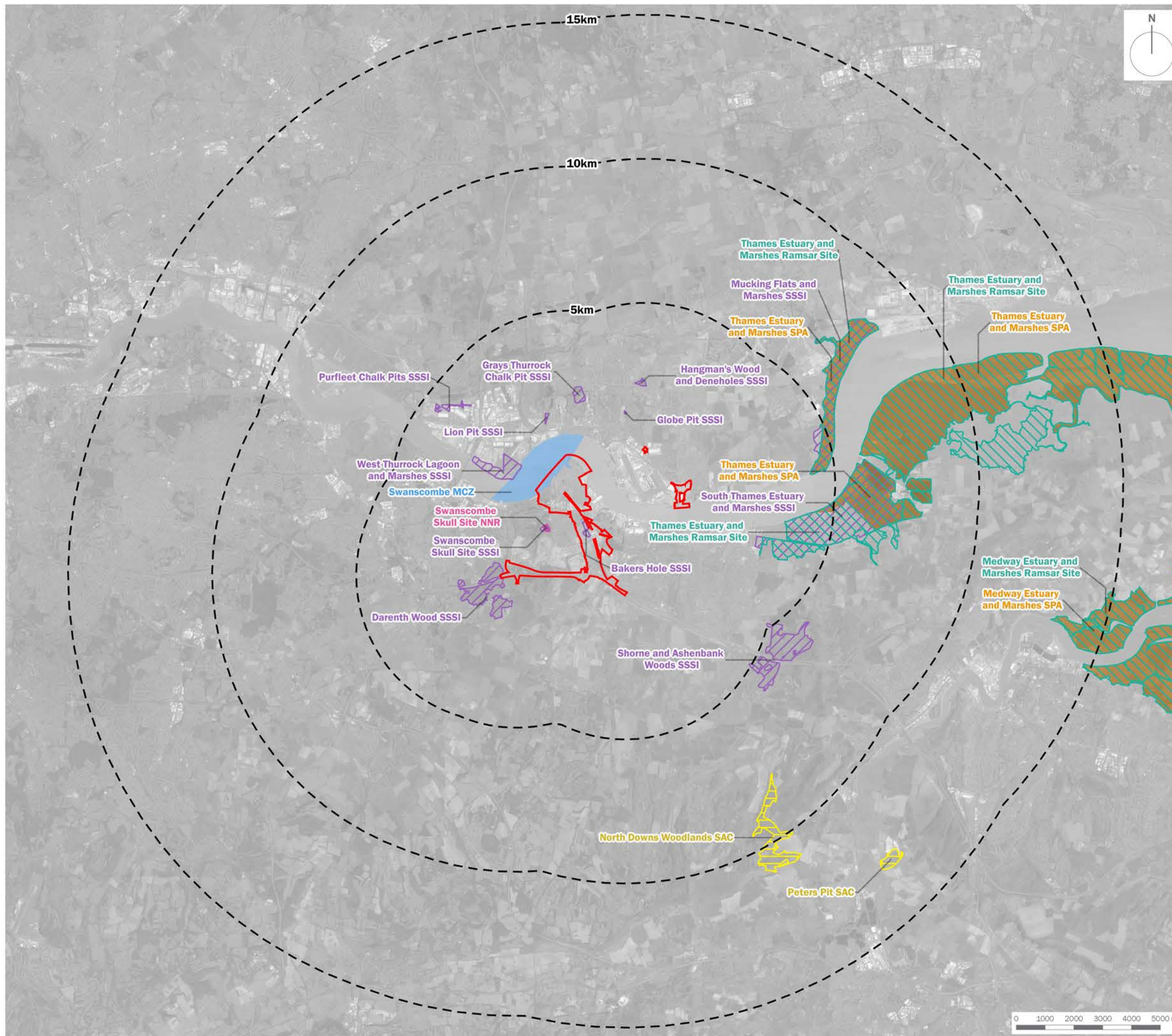
client
The London Resort Company Holdings Ltd

project title
The London Resort

drawing title
Figure 11.1: Phase 1 Habitat Plan (Sheet 11 of 11)

date	09 JUNE 2020	drawn by	GY
drawing number	edp5988_d047	checked	JB
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client	The London Resort Company Holdings Ltd		
project title	The London Resort		
drawing title	Figure 11.2: Statutory Designated Sites - Ecology		
date	09 JUNE 2020	drawn by	GY
drawing number	edp5988_d048	checked	WC
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Twelve ◆ Marine Ecology and Biodiversity

INTRODUCTION

- 12.1 The London Resort project (hereafter referred to as ‘the Project’) has the potential to impact upon the ecology of the tidal River Thames in terms of water quality and marine habitats and species.
- 12.2 The following sections summarise the relevant legislation/policy, the Scoping Opinion that was sought for the Scoping Report submitted in 2014 and consultees comments. In addition, a high-level summary is provided of background ecology data and there is a preliminary indication of potential effects of the Project on marine ecology along with the identification of some potential measures to mitigate impacts.

RELEVANT LAW, POLICY AND GUIDANCE

- 12.3 An Environmental Impact Assessment (EIA) is required to be conducted under the Marine Works (EIA) Regulations 2007 for the aspects of the Project that are below mean high water springs (MHWS).
- 12.4 At the Kent Project Site this includes the construction of two new jetties for a passenger ferry terminal, structural remedial works/renovation of Bell’s Wharf and the existing White’s Jetty (including a new roll-on roll-off (RoRo) facility). There are also proposals for a potential wastewater treatment plant and a potential Water Source Heat Pump (WSHP) at the Kent Project Site but plans for these are currently at very early stages.
- 12.5 At the Essex Project Site there is a proposed extension of the jetty at Port of Tilbury and there will be a mooring area for vessels in the immediate vicinity of the jetty extension.
- 12.6 An Appropriate Assessment (AA) is also required, in accordance with the Council Directive 2009/147/EC of 30 November 2009 on the conservation of wild birds (known as the Birds Directive), due to the potential impacts of the project on the Thames Estuary and Marshes Special Protection Area (SPA) which is located 3 km east of the Project red line boundary. Consideration will also be given to any potential likely significant effects on the marine ecology features of the Medway Estuary & Marshes SPA/Ramsar and the Swale SPA/Ramsar although given their distance from the Project Site, none of the Project activities are expected to affect these features of these SPA/Ramsar sites. A Marine Conservation Zone (MCZ) Assessment is also required due to the location of the Project Site within the Swanscombe MCZ and a Water Framework Directive (WFD) assessment is necessary to determine whether there are any aspects of the Proposed Development which could have a detrimental effect on

the current status of the Thames Middle WFD water body.

12.7 Key legislation and policy relevant specifically to marine ecology includes, but is not restricted to, the following:

International

- Conservation of Natural Habitats and of Wild Fauna and Flora (92/43/EEC) (the 'Habitats Directive');
- Conservation of Wild Birds (2009/147/EC) (the 'Birds Directive');
- Ramsar Convention on Wetlands of International Importance 1972;
- Water Framework Directive (WFD) (2000/60/EC);
- Marine Strategy Framework Directive (MSFD) (2008/56/EC);
- Convention for the Protection of the Marine Environment of the North-East Atlantic (the 'OSPAR Convention') 1992;
- EU Alien Invasive Species Regulation (Regulation No 1143/2014);
- Convention on the Conservation of European Wildlife and Natural Habitats (the 'Bern Convention');
- Convention on the Conservation of Migratory Species of Wild Animals (the 'Bonn Convention');
- Convention on Biological Diversity 1992;
- Council Regulation (EC) No. 1100/2007: Establishing measures for the recovery of the stock of European eel; and
- International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM).

National

- Port of London Act 1968 (as amended);
- Conservation of Seals Act 1970;

- Salmon and Freshwater Fisheries Act 1975 (as amended);
- The Marine and Coastal Access Act 2009 (as amended);
- The Wildlife and Countryside Act 1981 (as amended);
- The Water Resources Act 1991 (WRA);
- The Water Act 2014;
- The Conservation of Habitats and Species Regulations 2017 (the ‘Habitats Regulations’);
- The Eels (England and Wales) Regulations 2009 (SI 2009 No. 3344);
- The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017;
- The Natural Environment and Rural Communities (NERC) Act 2006; and
- Environmental Permitting (England and Wales) Regulations 2016 (EPR 2016).

12.8 National Policy Statements (NPS) set out the need for and government’s policies to deliver Nationally Significant Infrastructure Projects (NSIPs) in England. Chapter three of this scoping report explains that there is no NPS for business and commercial NSIP projects. However, to the extent that the Project includes transport and highways infrastructure regards will be had to relevant policy in the NPS for National Networks, including:

- Environmental and Social Impacts (NPS paragraphs 3.2 to 3.5);
- Climate Change Adaptation (NPS paragraphs 4.36 to 4.47);
- Pollution Control and other Environmental Protection Regimes (NPS paragraphs 4.48 to 4.56);
- Flood Risk (NPS paragraphs 5.90 to 5.115); and
- Water Quality and Resources (NPS paragraphs 5.219 to 5.231).

12.9 To the extent that the Project includes marine works related to the port, regard will be had to relevant policy in the NPS for Ports:

- Habitats Regulations Assessment (NPS paragraph 4.8.1);
- Pollution Control and other Environmental Regimes (NPS paragraphs 4.11.1 to 4.11.18);
- Climate Change Mitigation (NPS paragraphs 4.12.1 to 4.12.10);
- Climate Change Adaptation (NPS paragraphs 4.13.1 to 4.13.15);
- Biodiversity and Geological Conservation (NPS paragraphs 5.1.1 to 5.1.25); and
- Water Quality and Resources (5.6.1 to 5.6.12).

THE 2014 SCOPING OPINION

12.10 The Scoping Opinion requested in 2014 made several comments in relation to marine ecology, primarily in relation to the consideration of the Swanscombe recommended MCZ (now a designated MCZ), impacts to internationally designated sites and associated assessment under the Habitats Regulations, suggestions for baseline studies and targeting key species in addition to agreeing the methodology for the studies.

12.11 Paragraph 3.26 states: *'The Secretary of State recommends that the proposals should address fully the needs of protecting and enhancing biodiversity. The assessment should cover habitats, species and processes within the site and its surroundings. The Secretary of State draws attention in particular, but not exclusively, to the effects on water birds and on intertidal and coastal habitats. The Scoping Report indicates that the proposals may include infrastructure for access by boat from the Thames. The Secretary of State therefore considers that the assessment should cover potential impacts to the estuarine/marine habitat as well as intertidal and terrestrial habitats. NE have provided advice on particular areas of interest including marine features, and the EA have commented on additional species to be included within the scope of the surveys, including marine mammals (see Appendix 2 of the Scoping Opinion). The responses from Kent County Council (KCC), Dartford Borough Council (DBC), the Marine Management Organisation (MMO), and the Port of London Authority (PLA) also highlight the need for an assessment of the potential impacts on the marine environment (provided in Appendix 2 of the Scoping Opinion).'*

12.12 Paragraph 3.27 states: *'The potential impacts on international and nationally designated sites should be addressed as well as county level habitats. The Secretary of State notes the presence of Baker's Hole SSSI within the development area, and a*

number of other SSSI and nationally and locally designated sites within the surrounding area.'

- 12.13 Paragraph 3.28 states: *'The Secretary of State notes the possible need for a Habitats Regulations Assessment in view of the development site's location in relation to the Thames Estuary & Marshes SPA and Ramsar site, the Medway Estuary & Marshes SPA/Ramsar and the Swale SPA/Ramsar, and the potential impacts resulting from the development. The applicant's attention is drawn to the response from the MMO, NE, and Gravesham Borough Council (GBC) (in Appendix 2 of the Scoping Opinion) regarding the need for this assessment, and further advice is provided in Section 4 of this Opinion.'*
- 12.14 Paragraph 3.65 states: *'The noise and vibration assessments should take account of potential traffic movements along access routes, especially during the construction phase. The results from the noise and vibration assessments will also provide information to inform the ecological assessments therefore the ES should include cross-referencing to relevant chapters/appendices as appropriate. Noise and vibration levels from works along the foreshore of the River Thames (potentially affecting birds and marine ecology) should be assessed.'*
- 12.15 The 2014 Scoping Opinion also made the following comment in Paragraph 3.35 that is of relevance to water quality: *'The Scoping Report makes mention at Paragraph 7.5 of the Water Framework Directive, however it is unclear at this stage how the Directive will be taken into account by the assessment. The EA and GBC have provided advice in their responses (provided in Appendix 2) on how this might be addressed. Further advice on the regulatory and policy context to be applied to the assessment is also provided by the EA.'*

CONSULTATION FEEDBACK

Table 12.1. Excerpts of consultation responses in relation to Marine Ecology in the 2014 Scoping Opinion from the Planning Inspectorate (from Environment Agency, Marine Management Organisation, Natural England and the Port of London Authority).

Consultee	Response
Environment Agency	<p>We also advise that harbour and grey seals are considered when deciding which further baseline surveys are required. They are found in this part of the Thames Estuary and are known to haul out at suitable locations. They are vulnerable to disturbance and therefore the use of the site should consider the likely impacts on individuals and how to mitigate the impacts. The Zoological Society of London has some data on seals, which may indicate if further surveys are required.</p> <p>Marine intertidal and subtidal surveys will be necessary to allow assessment of potential impacts upon the protected species <i>Alkmaria</i></p>

Consultee	Response
	<p><i>romijni</i> (Tentacled lagoon-worm).</p> <p>A possible impact of not having a rigorous baseline level for aquatic invertebrates is that it may not be possible to properly assess the impacts of the development on ecology and water quality.</p> <p>The EIA should take into account the planned increase in sea traffic as a result of the development, which would increase disturbance and could also be an erosion risk to the saltmarsh, which is already showing signs of erosion from boat wash. It may also impact on the West Thurrock lagoon and marshes Site of Special Scientific Interest.</p> <p>The increase in boat traffic, dredging for navigation, new moorings and jetty construction will need to consider the impact upon the marine protected species <i>Alkmaria romijni</i> which has been found within this stretch of the river Thames and was a supporting element for the Thames estuary proposed Marine Protection zone. The impact of flood defences and coastal realignment will also need to consider the potential impact upon this species.</p> <p>The EIA also needs to include the identification of and assessment of impacts to coastal, intertidal and marine habitats, plus the potential for indirect effect on other coastal areas if there are changes to the hydrology at this location. There should also be consideration of the impacts in the context of climate change and rising sea levels.</p>
Marine Management Organisation	<p>It should be noted that, if a deemed marine licence/marine licence is required, all related mitigation measures will need to be captured, where appropriate, as conditions within the deemed marine licence/marine licence.</p> <p>It is the prerogative of the developer to decide how exactly the Environmental Statement is structured., However, if Marine aspects are not assessed in a standalone chapter we would expect the following issues to be addressed elsewhere in the report:</p> <ul style="list-style-type: none"> • Marine ecology (including fisheries); • Underwater noise and vibration (e.g. Percussive piling); • Coastal processes (including scour and accretion); • Navigational risk; • Dredging and disposal of dredged materials; • Impacts upon other legitimate users of the marine environment

Consultee	Response
	<p>It is important for any assessment to consider the potential cumulative effects of this proposal, including all supporting infrastructure, with other similar proposals and a thorough assessment of the ‘in combination’ effects of the proposed development with any existing developments and current applications. Consideration of the implications of the whole scheme including associated development should be included in the Environmental Statement.</p> <p>Details of European designated sites as well as sites of regional and local importance are contained within the report. In addition, The Thames has been recommended for designation as a marine conservation zone (rMCZ) and developers should be aware that the Department for Environment, Food and Rural Affairs (Defra) may wish to designate this site in future tranches of MCZ designations. Consideration should therefore be given to potential direct and indirect impacts of the development upon the Thames rMCZ¹.</p> <p>As the development is not directly connected with, or necessary to, the management of a European site, it is likely that the development could have a significant effect on internationally designated sites and will therefore require assessment under the Habitats Regulations. As such we recommend that a separate section of the Environmental Statement is included entitled ‘Information to support a Habitats Regulations Assessment’.</p> <p>Depending upon the proposed works baseline studies are likely to be required in order to assess the impacts of the proposed development upon the marine environment. The studies should reflect the key species identified in the designated areas (including the proposed interest features of the rMCZ). As such surveys may be required for a range of organisms ranging from benthic organisms, to marine mammals and sea birds.</p> <p>The details of such studies including the methodology, effort, timing and area will need to be agreed and need to be designed holistically to cover the site and surrounding area.</p> <p>The EIA must include an assessment of the environmental effects of those species and habitats on the OSPAR List of Threatened and Declining Species and Habitats.</p> <p>Table 6.3 suggests that dredging will be undertaken as part of the</p>

¹ This site is now designated as the Swanscombe MCZ.

Consultee	Response
	<p>construction works and also refers to increased erosion as a result of increased river traffic. The impacts of such activities on the ecology of the project site and designated sites will need to be considered during both the construction and operational phase.</p> <p>Table 6.3 also refers to potential loss of habitat. Such areas may be used as feeding and/or roosting areas.</p> <p>Consideration of commercial fisheries, nurseries and spawning areas should also be undertaken.</p> <p>Impacts on the marine environment must be considered in order to be able to justify whether they should or should not be scoped out of the EIA process.</p>
Natural England	<p>The Thames has been recommended for designation as a marine conservation zone (rMCZ¹) and developers should be aware that the Department for Environment, Food and Rural Affairs (Defra) may wish to designate this site in future tranches of MCZ designations. Consequently, Natural England recommends that the environmental statement should give consideration to the potential direct and indirect impacts to The Thames rMCZ.</p> <p>In this case the proposal is not directly connected with, or necessary to, the management of a European site. Based upon the current information, in our view it is likely that the proposal will have a significant effect on internationally designated sites and therefore will require assessment under the Habitats Regulations. We recommend that there should be a separate section of the Environmental Statement to address impacts upon European and Ramsar sites entitled 'Information for Habitats Regulations Assessment'. The Natura 2000 network site conservation objectives are available on our internet site at http://publications.naturalengland.org.uk/category/6490068894089216 which should be of help when preparing this information.</p> <p>The environmental statement should thoroughly assess the impact of the proposals on habitats and/or species listed as 'Habitats and Species of Principal Importance' within the England Biodiversity List, published under the requirements of S41 of the Natural Environment and Rural Communities (NERC) Act 2006. Section 40 of the NERC Act 2006 places a general duty on all public authorities to conserve and enhance biodiversity.</p>
Port of London Authority	<p>The River bus facilities are not identified in paragraph 6.57 as being likely to have potential ecological effects. It is not clear yet whether an existing</p>

Consultee	Response
	jetty is to be utilised or a new jetty is proposed ² . However table 6.3 does identify disturbance and silt mobilisation resulting from dredging and jetty construction works as a potential ecological effect and it also identifies “long term changes to accretion and erosion of saltmarsh and mudflat habitats resulting from the existence of the jetty and increased wash arising from boat traffic”.

BASELINE CONDITIONS AND MAIN ISSUES

Desk Study

12.16 To inform this scoping report a high-level desk study has been conducted. This involved a review of statutory and non-statutory designated sites, notable habitats and species using existing ecological data including, but not restricted to, the following:

- Range of published and grey literature;
- Zoological Society for London (ZSL) Thames Marine Mammal Sightings Survey (TMMSS) 2015;
- Environment Agency (EA) monitoring of water quality and sediment quality at Greenhithe and Gravesend;
- EA Marine Monitoring Service (saltmarsh); and
- National Fish Populations Database (NFPD): TraC Fish Counts for all Species for all Estuaries and all years (Environment Agency).

12.17 In addition, a number of aquatic ecology surveys were commissioned by London Paramount at Swanscombe (the ‘Kent Site’) in the period 2014 to 2016 in support of proposals for this Project at the ‘Kent Site’. These have been reviewed to attain further understanding of the baseline environment at Swanscombe. These studies include:

- Intertidal habitat survey;
- Subtidal habitat survey;
- Saltmarsh fish survey; and

² It is now clarified that part of the works is the construction of new jetties.

- Marine mammal surveys.

12.18 Where additional survey effort has been identified as necessary to obtain sufficient site characterisation data to inform the impact assessment for the Kent and Essex Project Sites, this is indicated within the receptor data summary sections and the Approach and Methodology section below.

Designated Sites

12.19 Relevant data will be reviewed from Defra's Magic Maps application and Natural England's Designated Sites viewer to obtain further information for sites in the vicinity of the Proposed Development (see Table 12.2). In addition, site conservation objectives will be reviewed from Joint Nature Conservation Committee (JNCC) and Natural England's online resources for the Swanscombe MCZ and Thames Estuary and Marshes SPA, alongside supporting Advice on Operations information. Further information will be gathered from other published reports such as assessments conducted for other local infrastructure projects (e.g. the Tilbury 2 development).

12.20 There are a number of protected areas within 10 km of the Kent and Essex Project Sites including Swanscombe MCZ and the Thames Estuary and Marshes SPA and Ramsar site and several Sites of Special Scientific Interest (SSSIs) (Table 12.2). A 10 km buffer was adopted for the consideration of designated sites in relation to marine ecology as it is considered effects of the project are unlikely to extend beyond this distance.

Table 12.2. Designated sites, protected features and distance from the London Resort.

Designated sites	Distance to the Kent Project Site (km)	Distance to the Essex Project Site (km)	Protected features
Swanscombe MCZ	0 km	4 km	Intertidal mud Tentacled lagoon-worm <i>Alkmaria romijni</i>
Thames Estuary and Marshes SPA	3 km	4.6 km	Eight bird species Waterbird assemblage Supporting habitat: Coastal lagoons Coastal reedbeds Freshwater and coastal grazing marsh Salicornia and other annuals colonising mud and sand Spartina swards Intertidal seagrass beds

Designated sites	Distance to the Kent Project Site (km)	Distance to the Essex Project Site (km)	Protected features
			Intertidal mixed sediments Intertidal mud Intertidal sand and muddy sand Water column
Thames Estuary and Marshes Ramsar	3 km	4.6 km	Ramsar criterion 2 The site supports more than 20 British Red Data Book invertebrates and populations of the GB Red Book endangered least lettuce (<i>Lactuca saligna</i>), as well as the vulnerable slender hare's-ear (<i>Bupleurum tenuissimum</i>), divided sedge (<i>Carex divisa</i>), sea barley (<i>Hordeum marinum</i>), Borrer's saltmarsh-grass (<i>Puccinellia fasciculata</i>), and dwarf eelgrass (<i>Zostera noltei</i>). Ramsar criterion 5: Assemblages of international importance: Species with peak counts in winter: 45,118 waterfowl (5 year peak mean 1998/99-2002/2003) Ramsar criterion 6: Species/populations occurring at levels of international importance. Qualifying Species/populations (as identified at designation): Species with peak counts in spring/autumn: Black-tailed godwit <i>Limosa islandica</i> Species with peak counts in winter: Dunlin <i>Caldris alpina</i> Red knot <i>Caldris canutus islandica</i>
Inner Thames	5.7 km	10.5 km	Aggregations of non-breeding birds – Teal,

Designated sites	Distance to the Kent Project Site (km)	Distance to the Essex Project Site (km)	Protected features
Marshes SSSI			<i>Anas crecca</i> Assemblages of breeding birds – Lowland damp grasslands Invertebrate assemblage Vascular plant assemblage
West Thurrock Lagoon & Marshes SSSI	1 km	4.6 km	Aggregations of non-breeding birds – Dunlin, <i>Calidris alpina</i> Aggregations of non-breeding birds – Redshank, <i>Tringa tetanus</i>
South Thames Estuary and Marshes SSSI	7.1 km	2.7 km	Aggregations of three species of breeding birds, 16 species of non-breeding birds Assemblages of breeding birds – Lowland damp grasslands Assemblages of breeding birds – Lowland open waters and their margins Assemblages of breeding birds – Sand-dunes and saltmarshes Invertebrate assemblage Lowland ditch systems SD1 – <i>Rumex crispus</i> – <i>Glaucium flavum</i> shingle community SM1 – <i>Zostera</i> communities SM10 – Transitional low marsh vegetation with <i>Puccinellia maritima</i> , annual <i>Salicornia</i> species and <i>Suaeda maritima</i> SM12 – Rayed <i>Aster tripolium</i> on saltmarsh SM13a – <i>Puccinellia maritima</i> saltmarsh, <i>Puccinellia maritima</i> dominant sub-community SM14 – <i>Atriplex portulacoides</i> saltmarsh SM26 – <i>Inula crithmoides</i> stands SM6 – <i>Spartina anglica</i> saltmarsh SM7 – <i>Sarcocornia perennis</i> SM8 – Annual <i>Salicornia</i> saltmarsh SM9 – <i>Suaeda maritima</i> saltmarsh Vascular plant assemblage
Mucking Flats	7.8 km	4.4 km	Aggregations of 6 species of non-breeding

Designated sites	Distance to the Kent Project Site (km)	Distance to the Essex Project Site (km)	Protected features
and Marshes SSSI			birds Invertebrate assemblage

Water Quality

- 12.21 Water quality is regulated to European Commission (EC) Directives, which set out standards for water quality and impose monitoring requirements. The Project is within the Thames Middle Water Framework Directive (WFD) transitional water body (GB530603911402). The Thames Middle water body is heavily modified and has a Moderate water quality status classification (latest is for 2016) although it is failing on chemical objectives for the priority hazardous substances 'tributyltin compounds'. This is primarily due to a high level of sewage and industrial run-off.
- 12.22 Water quality data relevant to the Project site will be collated from the EA water sampling points at Greenhithe (2.25 km upstream) and Gravesend (4.85 km downstream) which are the closest EA water quality stations to the Kent and Essex Project Sites. At both of these sites sampling takes place on a monthly or two monthly basis. The most recent sampling data available online at the time of writing for Greenhithe is February 2020 and for Gravesend is October 2019. Parameters recorded include water temperature, salinity and dissolved oxygen and concentration data are available for a wide range of dissolved metals and other chemicals (six different chemicals tested at Greenhithe and 22 chemicals tested at the Gravesend site).
- 12.23 A WFD assessment will be required to assess the impact of the Proposed Development on the status of the Thames Middle water body, including water quality status, due to activities including dredging (it is currently anticipated that dredging may not be required for the project but at this stage it has been assumed it could be undertaken as a precautionary approach). Chemical levels recorded during the EA monitoring will be compared against relevant Environmental Quality Standards (EQSs)³ and details of all exceedances will be provided.
- 12.24 In terms of the potential wastewater treatment facility, it is assumed at this stage that the water discharged from the outfall of the waste treatment facility would meet any water quality criteria required for consent. For the WSHP, the temperature of discharged water to the River Thames is not expected to be more than 3°C greater than the intake temperature as a 98th percentile (i.e. ≤3°C uplift). Thermal plume

³EQS as dictated by the WFD (and associated Directives) and set out in DEFRA (2015) i.e. The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015.

modelling options will be considered by the project team.

- 12.25 Due to the availability of EA data and the frequency of the EA data collection no site-specific water quality monitoring is currently proposed for the Project.

Sediment Quality

- 12.26 There would be disturbance of sediment in the Thames due to dredging (if required) and potentially other activities in relation to the Project.
- 12.27 Chemical Action Level (cALs) concentrations have been established by Cefas. Results below cAL1 are generally considered acceptable for dredging and/or disposal at sea, pending other considerations such as physical suitability for the disposal site and potential beneficial uses. Sediments with contamination levels above cAL2 are considered unacceptable for uncontrolled disposal at sea without special handling and containment. Samples between cAL1 and cAL2 are assessed for suitability on a case by case basis.
- 12.28 Data presented in the Tilbury2 report demonstrates that at a site 3.5 km further downstream in 2017 sediment contamination levels for copper, zinc, lead, cadmium, chromium, nickel, arsenic, mercury and polycyclic aromatic hydrocarbons all exceeded cAL1 standards but were well within cAL2 (Tilbury2 2017).
- 12.29 To inform assessment of potential effects, including the WFD assessment, samples will be collected and chemical analysis conducted at the Kent and Essex Project Sites (as applicable) according to MMO guidance. Consultation will be held with stakeholders including the MMO to optimise design of the sampling once specific areas such as dredge pocket locations and extent are known. For the purposes of WFD assessment, chemical levels will be considered in relation to cALs (as indicated above) and Canadian sediment quality guideline Threshold Effect Levels (TELS) and Effects Range Low (ERL) values (for chemicals that do not have cALS), where appropriate.

Plankton

- 12.30 The plankton receptor incorporates phytoplankton, zooplankton and ichthyoplankton (fish larvae and eggs).
- 12.31 Of these, phytoplankton is a biological element contributing to the ecological status of the Thames Middle water body and in 2016⁴ the WFD phytoplankton status for the Thames Middle waterbody was classified as 'Good'.
- 12.32 Data for the Port of Tilbury from the EA presented in the Tilbury2 report (Tilbury2 2017) indicates the presence of typical estuarine species within the study area and no protected phytoplankton were identified. The groups identified include diatoms, dinoflagellates, silicoflagellates, green algae, Chrysophyceae, Raphidophyceae and

⁴ This is the most recent date for the assignment of WFD status.

blue-green algae.

- 12.33 The latest EA phytoplankton monitoring data for stations in the Thames Estuary will be obtained to inform the assessment.
- 12.34 In terms of zooplankton, Gordon *et al.* (1998) studied the mesozooplanktonic fauna at nine sites along the Thames Tideway stretching from Kew to Tilbury. The dominant zooplankton species recorded were calanoid copepods with *Eurytemora affinis* occurring most frequently within this group peaking in late autumn and early spring.
- 12.35 Sparse data are available for ichthyoplankton in the Thames Estuary although the potential to obtain ichthyoplankton data collected recently for other projects in the area will be explored.
- 12.36 Based on current Project design information and the fact that distribution and assemblage composition of plankton will primarily be determined by tidal movements to and from the area each day, it is considered that any effects of the Project on plankton is not likely to be significant. Consequently, no site-specific plankton monitoring is currently proposed for the Project.
- 12.37 In terms of potential abstraction of water from the River Thames, design details are currently being considered. The abstraction rate could potentially be less than 1 cumec. Best-practice intake screening requirements for the Thames Estuary will be applied where possible dependant on operational considerations (with specific understanding of requirements for glass eel (juvenile *Anguilla anguilla*)). At this stage no specific additional survey is proposed to inform assessment for this element of the project.

Intertidal Habitats and Species

- 12.38 Surveys conducted for the Tilbury2 port project in 2017 (approximately 3.5 km downstream of the Project site on the North bank) identified several intertidal biotopes in and around the Tilbury area but the only Habitats of Principal Importance on Section 41 of the NERC Act that were recorded were 'Coastal saltmarsh' and 'Intertidal mudflats'. A total of 29 intertidal species were recorded during the Tilbury2 intertidal surveys.
- 12.39 Data will be sourced from other local developments where available.
- 12.40 An intertidal survey was carried out by Aquatronics Ltd in 2015 for the London Resort Project (Aquatronics Ltd 2016). During this survey intertidal habitats were mapped across the Kent Project Site. Core samples (with three replicates taken per station) were collected from 11 stations. Sampling was also undertaken at 16 hard substrate stations (a range of natural and artificial habitats including revetments and jetty supports). Seaweed samples were collected from two sites for seaweed washing and sweep net sampling was undertaken at low and high water at three sites (Aquatronics Ltd 2016).

12.41 In total 66 taxa were recorded across all intertidal stations (17 algae (seaweeds) and lichens taxa and 49 invertebrate taxa). Crustaceans were the most numerous taxonomic group (24 taxa), followed by annelids (13 taxa) and then green algae (10 taxa). The most commonly recorded species in the core samples was the oligochaete *Baltidrilus costatus*.

12.42 The only species of conservation importance was the amphipod crustacean *Apocorophium lacustre* which was recorded at several of the lower shore hard substrate sites and is currently listed as 'Nationally Scarce' by the Joint Nature Conservation Committee (JNCC) (Aquatonics 2016).

12.43 The following Habitats of Principal Importance on Section 41 of the NERC Act were recorded (previously listed as UK Biodiversity Action Plan (BAP) Priority Habitats):

- Estuarine rocky habitats;
- Intertidal mudflats;
- Intertidal underboulder communities;
- Sheltered muddy gravels;
- Peat and clay exposures with piddocks (it was a variant in that piddocks were not recorded at Swanscombe but the clay substrate was and this is the only EUNIS/JNCC habitat description that can be assigned to intertidal clay substrates); and
- Coastal saltmarsh.

12.44 None of these areas were considered to be good examples of the habitat types in the report (Aquatonics Ltd 2016) due to the low and variable salinity at the site, high turbidity, the presence of non-native species and the low diversity of native species.

12.45 The following non-native species were recorded during the survey:

- Pacific oyster *Magallana gigas* (previously *Crassostrea gigas*);
- Acorn barnacle *Amphibalanus improvisus*;
- Acorn barnacle *Austrominius modestus*;
- Serpulid tube worm *Ficopomatus enigmaticus*; and
- Tubificid oligochaete worm *Tubificoides heterochaetus*.

12.46 Records from the NBN Atlas from 1965 to 2017 identify 13 records of non-native species and cryptogenic species (i.e. neither demonstrably native nor non-native)

within the vicinity of the Kent and Essex sites. These include one cryptogenic species, the sea grape *Molgula manhattensis* (4 records) and five non-native species (which can be found in intertidal or shallow subtidal environments):

- Acorn barnacle *A. modestus* (5 records);
- Acorn barnacle *A. improvisus* (1 record);
- Chinese mitten crab, *Eriocheir sinensis* (1 record);
- Jenkins' spire snail *Potamopyrgus antipodarum* (1 record); and
- American Piddock, *Petricolaria pholadiformis* (1 record).

12.47 Records from the Kent and Medway Biological records from 1971 to 2018 identify nine records of non-native species within the vicinity of the Kent Project Site for the London Resort and include three non-native species:

- Slipper limpet *Crepidula fornicata* (2 records);
- Pacific oyster *Magallana gigas* (1 record); and
- Chinese mitten crab, *Eriocheir sinensis* (6 records).

12.48 Records will also be sought from the Essex Wildlife Trust Biological Records Centre.

12.49 Preliminary findings from data on the intertidal habitat within the area suggest that species diversity of the intertidal zone within and in the vicinity of the Project Site is likely relatively low.

12.50 A Project-specific intertidal survey is proposed to map habitats and characterise taxa across the Project area. Consideration of Project design information has been used to inform the scope of the intertidal survey and consultation will be undertaken with stakeholders (e.g. the EA and MMO) to finalise scope.

Subtidal Habitats and Species

12.51 The EA conducts monitoring of subtidal invertebrates in the Thames Estuary and these data form the basis of the WFD status for the 'Invertebrate' biological element for WFD waterbodies. The latest WFD invertebrate status for the Thames Middle waterbody is 'Good', as classified in 2016.

12.52 Monitoring data will be obtained from the EA for the Project area, where available. Natural England will also be contacted to determine if they have any relevant data, especially in relation to the distribution of the tentacled lagoon worm *Alkmaria romijni*.

- 12.53 Subtidal surveys conducted for the nearby Tilbury2 project in 2017 assigned the biotope '*Polydora ciliata* and *Corophium volutator* in variable salinity infralittoral firm mud or clay' (SS.SMu.SMuVS.PolCvol – EUNIS code: A5.321) to all subtidal samples (Tilbury2 2017). Estuary bed diversity was determined to be relatively low with a total of 47 subtidal species identified, the polychaete *Polydora* spp. was the most dominant taxon found at most of the subtidal stations. Data will be sourced from other local developments where available.
- 12.54 A subtidal survey was carried out at the Kent Project Site for the London Resort Project by Ocean Ecology in 2015 (Ocean Ecology 2016). A total of nine sampling stations were targeted with two of these positioned to specifically characterise the macroinvertebrate community found in the immediate vicinity of jetty enhancement and floating pontoon works proposed at the time of the surveys.
- 12.55 The survey data indicated that annelids were the most abundant taxa. The polychaete worm *Streblospio shrubsolii* was the most abundant species sampled across the area of interest and other frequently occurring and abundant species included the oligochaetes *Tubificoides benedii* and *B. costatus*. Two species of conservation interest were recorded: the tentacled lagoon worm *A. romijni*, and the mud shrimp *A. lacustre*. *A. romijni* and *A. lacustre* are both currently listed as 'Nationally Scarce' by the Joint Nature Conservation Committee (JNCC). *A. romijni* is a Schedule 5 species under the Wildlife and Countryside Act and is a designated feature of the Swanscombe MCZ. Both *A. romijni* and *A. lacustre* are considered to be locally abundant in this area of the Thames.
- 12.56 No non-native species were recorded in the subtidal samples.
- 12.57 A Project-specific subtidal survey is proposed to map habitats and characterise taxa across the Project area at both the Kent and Essex Project Sites. Consideration of Project design information has been used to inform the scope of the subtidal survey and consultation will be undertaken with the Environment Agency to finalise scope.

Saltmarsh

- 12.58 The tidal Thames has areas of saltmarsh on both the north and south shores. A report by the EA in 2011 outlined 537 ha of saltmarsh habitat within the tidal Thames (Phelan *et al.* 2011).
- 12.59 The EA conducts monitoring of saltmarsh in the Thames Estuary and data will be obtained from the EA for the Project area, where available. Natural England will also be contacted to determine if they have any relevant data.
- 12.60 Limited saltmarsh data were recorded during a project-specific intertidal survey conducted in 2015 by Aquatronics Ltd (Aquatronics Ltd 2016) and project-specific saltmarsh fish surveys (Colclough & Coates 2015).
- 12.61 During the intertidal surveys (Aquatronics, 2015) and saltmarsh fish surveys (Colclough & Coates 2015) at the Project site the following saltmarsh plant species were

recorded:

- Mudflats – *Spartina* spp. and *Salicornia* spp.;
- Low marsh – *Puccinellia maritima*, *Triglochin maritima*, *Aster tripolium*, *Spergularia* spp.;
- Upper marsh – *Atriplex portulacoides*, *Limonium vulgare*, *Atriplex hastata*; and
- Above High Water – *Elytrigia atherica*, *Phragmites australis*, *Beta vulgaris*.

12.62 A site-specific survey will be conducted to map the extent of saltmarsh across the Kent Project Site. The survey will determine the distribution of National Vegetation Classification community types across saltmarsh at the Kent Project Site and obtain species percentage cover data for vegetation in each community type.

Fish (intertidal and Subtidal)

12.63 The Thames Estuary provides both spawning and nursery grounds for a number of marine species. In particular, the EA, Kent and Essex Inshore Fisheries and Conservation Authority (IFCA) and Marine Management Organisation (MMO) have highlighted the importance of the use of the lower Thames Estuary as a spawning and nursery ground for Dover sole *Solea* and Atlantic herring *Clupea harengus* and a nursery ground for European seabass *Dicentrarchus labrax* (PINS 2017). Lemon sole *Microstomus kitt* also utilises the Estuary for both spawning and as a nursery ground.

12.64 The Thames Estuary also provides nursery habitats for European flounder *Platichthys flesus*, European plaice *Pleuronectes platessa*, whiting *Merlangius merlangus*, European sprat *Sprattus* and Atlantic mackerel *Scomber scombrus* (Coull *et al.* 1998, Ellis *et al.* 2012, ABPmer 2013, Jacobs 2014).

12.65 Seasonality is an important consideration for many species within the tidal Thames which can utilise the estuary at different times of year for spawning of adults, as a nursery ground for juveniles, or for migration up or downstream for diadromous species.

12.66 A primary source of information is EA survey data (available in the National Fish Population Database) with monitoring surveys undertaken between 1989 and 2019 throughout the estuary. The latest WFD fish status for Thames Middle waterbody is 'Good', as classified in 2016.

12.67 Preliminary findings from the EA fish monitoring within the Thames, including programmes such as Tideway Monitoring Programme, the National Marine Monitoring Programme, and WFD monitoring work, have identified over 125 fish species in the Thames including species of commercial and conservation interest (Environment Agency 2019). Data will be obtained for stations closest to the Project Site, however, as fish are highly mobile data from the Thames Estuary as a whole will

be considered.

- 12.68 ZSL has undertaken monitoring of the intake screens at Tilbury Power Station from 2006 to 2010. The most commonly caught fish species included European flounder *Platichthys flesus*, Dover sole *S. solea*, European seabass *D. labrax*, European smelt *Osmerus eperlanus*, European sprat *S. sprattus* and sand goby *Pomatoschistus minutus* (Tilbury2 2017).
- 12.69 Preliminary findings from ZSL data highlighted species of conservation importance with the potential to be within the study area, these included Allis shad *Alosa*, sand goby *P. minutus*, sandeel *Ammodytes marinus*, mackerel *Scomber scombrus*, Dover sole *S. solea*, salmon *Salmo salar*, sea trout *Salmo trutta*, herring *C. harengus*, cod *Gadus morhua*, whiting *Merlangius merlangus*, plaice *Pleuronectes platessa*, smelt *O. eperlanus*, European eel *A. anguilla*, and short-snouted seahorse *Hippocampus* (ZSL 2016). These species are protected by a range legislation which protects the species and in many cases the habitat the species live in.
- 12.70 Of particular note is an important population of European smelt *O. eperlanus* in the Thames Estuary. The European smelt is a priority species on the Section 41 list of the NERC Act. In addition, European eel *A. anguilla* is of high conservation value. European eel is known to migrate through the Thames Estuary and utilise the estuary whilst maturing (Naismith & Knights 1988). The European eel is protected under European Council (EC) Regulation No 1100/2007, which establishes measures for the recovery of the stock of European eel. This is implemented in UK legislation by the Eels (England and Wales) Regulations.
- 12.71 Available data from other local infrastructure projects will also be sourced for review/consideration where available.
- 12.72 Site-specific fish surveys within saltmarsh locations around the Swanscombe Peninsula at the Kent Project Site were conducted by Colclough & Coates in 2015 for the London Resort Project (Colclough & Coates 2015). Five fish species were recorded within the saltmarsh locations around the peninsula including, sand goby *P. minutus*, sand smelt *Atherina presbyter*, seabass *D. labrax*, European eel *A. anguilla* and European sprat *S. sprattus*.
- 12.73 It is considered that a lot of data sources are available to determine the types of subtidal fish that could be present in the vicinity of the project and the times of year they could be present. However, site-specific fyke net and seine net survey is proposed to characterise the fish assemblages utilising the margins that could be affected by works in the intertidal zone.

Marine Mammals

- 12.74 Compared to other areas within the UK, the presence of marine mammals in the Thames estuary is low (SCOS 2016) especially upstream of Mucking (Evans & Anderwald 2007). The Thames Estuary is an area frequented by seals and transient

cetaceans (whales, dolphins and porpoises). Two cetacean species and two seal species are frequently recorded in the estuary, these being:

- Harbour porpoise *Phocoena*;
- Bottlenose dolphin *Tursiops truncatus*;
- Harbour (common) seal *Phoca vitulina*; and
- Grey seal *Halichoerus grypus*.

12.75 Another less frequently recorded species is white-beaked dolphin *Lagenorhynchus albirostris*.

12.76 ZSL collates opportunistic marine mammal sightings in the River Thames and Thames Estuary area recorded by members of the public, along with sightings reported by tour boat operators, and organisations such as the PLA, EA, Thames River Police, Port of London Health Authority and the Kent Mammal Group (this is known as the Thames Marine Mammal Sightings Survey (TMMSS)).

12.77 Data from the ZSL Thames Marine Mammal Sighting Survey (TMMSS) confirms that several marine mammal species frequent the Thames Estuary including harbour seals *P. vitulina*, grey seals *H. grypus*, harbour porpoises *P. phocoena*, dolphins and whales. The most common species identified in the study area were harbour seals. These data will be collated further to inform the EIA.

12.78 A desk study undertaken by Chris Blandford Associates (CBA) for the Kent Project Site from September 2015 to January 2016 identified 29 records of seals more or less equally divided between the two species (14 harbour seal, 15 grey seal), with a pronounced peak in seal records during the late summer and autumn period (18 of the 29 records were during August to October inclusive) (CBA 2016). For harbour porpoise there were a total of 14 records and seasonal patterns were not as clear as with seals, although there were no winter (December-February) records. None were recorded near Swanscombe Peninsula, however there were a number of records of dolphins further upstream, indicating that they must pass the Peninsula while moving up and down the river (CBA 2016).

12.79 CBA also carried out marine mammal surveys for the Project in 2015/16. A total of six harbour porpoise, ten grey seals and two harbour seals were recorded during high tide observations and there were four confirmed sightings of harbour seals and no sightings of grey seals or harbour porpoise during low tide observations (CBA 2016). Seals were observed hauled out between Stone Ness and the QEII Bridge on the north bank of the river and the south side of the river between Greenhithe and the QEII bridge as well as the north eastern edge of Swanscombe Peninsula.

12.80 It is considered that sufficient data are available to determine the types of marine mammals that could be present in the vicinity of the project at the Kent and Essex Project Sites and the times of year they could be present. Consequently, no site-specific marine mammal monitoring is currently proposed for the Project.

Future Baseline

12.81 Given the anticipated long-term lifetime of the project there is potential for some effects of climate change during operation of the London Resort. There are numerous models covering the UK which simulate the possible change in climate and the UK Climate Projections (UKCP18 (Defra 2019)) indicate there could be increases in mean summer temperatures in the longer term and milder winters (influencing sea water temperature), changes in rainfall distribution and seasonality, more extremes of weather and sea level rise (Defra 2019).

12.82 A review of the anticipated changes in marine ecology in the study area as a result of climate change will be provided within the EIA including consideration of the UKCP18 modelling outputs.

PRELIMINARY ASSESSMENT OF POTENTIAL EFFECTS

12.83 Potential effects on marine ecology during the construction phase of the Proposed Development could be associated with construction of two new jetties for a passenger ferry terminal, structural remedial works/renovation at White's Jetty and Bell's Wharf and construction of a RoRo facility at Bell's Wharf with effects potentially associated with other aspects of the works as the Project design is finalised.

12.84 Potential impacts during construction could include, but would not necessarily be restricted to:

- Direct loss of, and disturbance of, benthic species and habitats within the footprint of the works (including smothering);
- Changes to coastal processes due to construction of structures that could affect sediment transport and the erosion / deposition regime for saltmarsh and mudflats;
- Generation of underwater noise from vessel use, dredging activity and piling activity which could affect invertebrates, fish and marine mammals;
- Re-suspension and dispersion of potentially contaminated sediment during piling and dredging activities;
- Changes in water quality as a result of dredging and piling activities for the new jetties;

- Increased risk of the spread or introduction of non-native species due to introduction of new structures and associated use of plant / materials;
- Potential collision risk to marine mammals due to increased boat traffic during the construction phase;
- Impact of physical presence of structures and vessels on fish and marine mammals;
- Use of artificial lighting and effects of fish and marine mammals;
- Pollution risk from construction activities including accidental pollution events (e.g. oil spill); and
- Indirect physical disturbance and displacement (i.e. through the food chain).

12.85 Potential impacts to marine ecology receptors during the operational phase of the proposed scheme are primarily associated with the presence of structures and maintenance dredging (if required) and increased vessel traffic at and between the Kent and Essex Project Sites.

12.86 In addition potential effects of the WSHP will be considered but it is anticipated at this stage that best practice intake screening for the Thames Estuary will be applied as far as it possible (pending review of operational considerations) and that the temperature of discharged water to the River Thames is not expected to be more than 3°C greater than the intake temperature as a 98th percentile (i.e. $\leq 3^{\circ}\text{C}$ uplift). Thermal plume modelling options will be considered by the project team.

12.87 Potential effects during operation could include, but would not necessarily be restricted to:

- Changes to coastal processes due to presence of structures that could affect sediment transport and the erosion/deposition regime for saltmarsh and mudflats;
- Underwater noise impacts due to increased vessel traffic;
- Impingement/entrainment of plankton/fish at the intake for the WSHP (although as indicated above it is anticipated that best-practice intake screening requirements for the Thames Estuary will be met as far as possible based on considerations of operational constraints);
- Physical barrier to fish utilising the river margins for movement due to presence of new jetties (unlikely but dependant on design);
- Changes in water quality at the outfall of the wastewater treatment plant (although it is anticipated that the water discharged from the outfall of the waste

treatment facility would meet any water quality criteria required for consent);

- Changes in water temperature at the outfall for the WSHP (although it is anticipated that the temperature of discharged water to the River Thames is not expected to be more than 3°C greater than the intake temperature as a 98th percentile (i.e. ≤3°C uplift) which is understood to be acceptable to the regulators/statutory authorities). Thermal plume modelling options will be considered by the project team;
- Shading of benthic habitats and species by the new jetties;
- Light pollution from lighting of jetties and the wharf;
- Collision risk to marine mammals from increased boat traffic between Tilbury and Swanscombe;
- Accidental pollution events from operational vessels;
- Increased risk of spread and introduction of non-native species due to increased vessel movements;
- Disturbance of benthic habitats and removal of benthic invertebrates due to maintenance dredging (if required);
- Re-suspension and dispersion of potentially contaminated sediment during maintenance dredging activities (if required); and
- Changes in water quality as a result of maintenance dredging (if required).

12.88 Particular emphasis will be placed on potential effects on species and habitats of conservation interest including designated sites and the features of these sites. Effects on designated sites will primarily be considered in a standalone Habitat Regulations Assessment report.

APPROACH AND METHODOLOGY

Proposed Surveys

12.89 It is currently anticipated that existing data will be sufficient to define the baseline environment at the Kent and Essex Project Sites for water quality, plankton, subtidal fish, and marine mammals and no additional surveys are proposed for these receptors. Site-specific surveys at the Kent Project Site are proposed for intertidal and subtidal benthic habitats and species, saltmarsh and intertidal fish communities. A site-specific survey is proposed at the Essex Project Site for benthic species/habitats. A sediment quality survey is expected to be completed as part of other investigative works for the Project. The survey design will be subject to consultation with the Environment

Agency.

Ecological Impact Assessment

12.90 The general approach to the Ecological Impact Assessment (EclA) will follow the Guidelines for Ecological Impact Assessment produced by the Chartered Institute of Ecology and Environmental Management (CIEEM 2018). This will include determination of impact/receptor effect pathways, magnitude of impact, the conservation value of receptors and sensitivity of receptors to effects. All of this information will be considered to determine a significance level for effects for each impact/receptor pathway. For effects considered to be significant mitigation measures will be proposed, as appropriate.

Habitats Regulations Assessment – report to inform assessment

12.91 There is the potential that the development could have a significant effect on internationally designated sites and will therefore require assessment under the Habitats Regulations. As such an HRA report will be produced (a separate document to the ES) which will provide information to support a HRA and will include information on the marine habitat features of the nearby Special Protection Areas (SPAs) and Ramsar sites, as appropriate.

12.92 This will be undertaken using the latest Project design information, site characterisation data and the Natural England designated sites viewer for conservation objectives, including site-specific Advice on Operations to inform the Likely Significant Effect (LSE) test. For any impact and marine ecology receptor pathways for which there could be LSE an Appropriate Assessment (AA) will be required to determine whether there could be potential adverse effects on the integrity of the protected site. The HRA report will include an in-combination assessment which will consider multiple projects and their interactions with the London Resort Project to determine if in combination there is any potential for adverse effects on the integrity of the protected site.

Marine Conservation Zone Assessment

12.93 There is the potential that the development could have a significant effect on the features of the Swanscombe MCZ (tentacled lagoon worm *A. romijni* and Intertidal mud). Consequently, an MCZ assessment will be required under the Marine and Coastal Access Act.

12.94 This will be undertaken using the latest Project design information, site characterisation data and the Natural England designated sites viewer for conservation objectives and Advice on Operations (where available) for the Swanscombe MCZ. The MCZ assessment will include an in-combination assessment which will consider multiple projects and their interactions with the London Resort Project.

12.95 The MCZ assessment will determine if alone, or in-combination, there is a significant risk of a potential effect hindering the achievement of the conservation objectives stated for the MCZ and whether the public authority would be able to exercise its functions to further the conservation objectives stated for the MCZ.

WFD Assessment

12.96 Due to the interactions of the Project with the tidal Thames, including dredging (if required), operation of the WSHP (if required) and piling activities, a WFD assessment will be required based on the EA 'Clearing Waters for All' guidance for estuarine and coastal waters⁵. This is anticipated to be informed by the results of hydrodynamic modelling of the proposed dredging and new jetty structures, the chemical analysis of sediment samples taken at the proposed jetty locations⁶, and EA water quality data⁷ as well as ecological data, as required. The WFD assessment will determine whether there is a risk of changes to the current status of the Thames Middle WFD transitional water body (GB530603911402) due to the Project (overall classification for the Thames Middle water body for 2016 is 'Moderate').

PROPOSED AVOIDANCE AND MITIGATION MEASURES

12.97 Following assessment, any effects determined to be potentially significant would require the application of mitigation measures. It is not possible at this stage to pre-empt the outcomes of the impact assessment process, however, potential measures for construction activities could include:

- Implementation of a Construction Environmental Management Plan (CEMP) to control all construction activities for the Project. The CEMP would include provisions to reduce the risk of accidental spills or leakages and a Biosecurity Plan incorporating a Biosecurity Risk Assessment to reduce the risk of the introduction or spread of non-native species;
- Secure, bunded, refuelling locations. Standard construction best practice for site storage and handling of fuels and chemicals, to be included in the CEMP;
- Use of vibro-piling where possible instead of impact hammer/percussive piling to reduce the impacts of underwater noise and vibration;

⁵ <https://www.gov.uk/guidance/water-framework-directive-assessment-estuarine-and-coastal-waters>

⁶ With chemical levels in the sediment considered in relation to cALs (as indicated above) and Canadian sediment quality guideline Threshold Effect Levels (TELs) and Effects Range Low (ERL) values (for chemicals that do not have cALS), where appropriate.

⁷ With concentrations compared against relevant Environmental Quality Standards (EQSs).

- Use of a 'soft-start' for piling to reduce the risk of effects on marine mammals and fish;
- Use of a backhoe dredger instead of trailer suction hopper dredger (TSHD) to reduce the level of disturbance and suspension of sediments;
- Phasing of works to avoid sensitive seasons for marine species, e.g. fish spawning or migration periods;
- Surface water management strategy within the CEMP. Use of grip drains, catch pits, bunding and temporary settlement tanks prior to discharge; and
- Limiting lighting outputs and considering lighting orientation near the Thames where possible. If required, use baffles or internal louvres to provide directional lighting and avoid light spillage.

12.98 Potential avoidance and mitigation measures for operational activities could include:

- Implementation of an Operational Environmental Management Plan (OEMP) to control all operational activities for the Project. The OEMP would include provisions to reduce the risk of accidental spills or leakages and a Biosecurity Plan incorporating a Biosecurity Risk Assessment to reduce the risk of the introduction or spread of non-native species;
- Considerations for jetty design for the new ferry terminal jetties to limit changes to the hydrodynamic conditions at the site thereby reducing the potential for significant erosion/accretion on the intertidal mud or saltmarsh habitats as a result of the jetties;
- Potential for further saltmarsh or mudflat habitat creation through realignment of existing flood defences; and
- Application of best-practice intake screening (as far as is possible) for the intake for the potential WSHP.

UNCERTAINTIES

12.99 At this stage there are a number of project design options under consideration. Some of these options may change the scope of the Thames water quality, ecology and biodiversity assessment.

MATTERS TO BE SCOPED OUT

12.100 Based on current Project design information and the fact that distribution and

assemblage composition of plankton will be primarily determined by tidal movements to and from the area each day, it is considered that any effects of the Project on plankton (phytoplankton, zooplankton and ichthyoplankton) is not likely to be significant (this assumes the use of best-practice screening at the WSHP intake, which is anticipated to be implemented as far as is practicable). Under this scenario effects on this receptor have been scoped out of further assessment.

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Thirteen ◆ Cultural heritage and archaeology

INTRODUCTION

- 13.1 This chapter presents the scope of the assessments to be undertaken in relation to cultural heritage and archaeology for the Proposed Development. It will also outline the baseline conditions, work undertaken to date, a preliminary assessment of effects, approach and methodology and proposed mitigation measures.
- 13.2 The cultural heritage and archaeology chapter of the ES will assess the likely impact of the Proposed Development upon the historic environment and heritage assets within and surrounding the Project Site.

RELEVANT LAW, POLICY AND GUIDANCE

- 13.3 The following relevant law, policy and best practice guidance will be considered by the assessment.

International agreements

- 13.4 The United Kingdom is a signatory to the following international agreements, each of which is expressly concerned with the protection of the historic environment.
- The World Heritage Convention 1972.
 - European Convention on the Protection of the Archaeological Heritage (revised) 1992 (the Valetta Convention).
 - European Landscape Convention 2000.

National legislation

- 13.5 There is a significant body of statute law dealing with the historic environment. Heritage assets that are deemed to be of particular importance are given legal protection through the following national legislation.
- The Ancient Monuments and Archaeological Areas Act 1979.
 - The Planning (Listed Buildings and Conservation Areas) Act 1990.
 - The Hedgerows Regulations 1997 (as amended 2002).

- Protection of Wrecks Act 1973.
- Burial Act 1997.
- Treasure Act 1996.

National policy

- 13.6 The principal national guidance on the importance, management and safeguarding of the historic environment resource within the planning process is National Planning Policy Framework (NPPF, February 2019) chapter 16: *Conserving and Enhancing the Historic Environment*, which sets out the national guidance on the importance management and safeguarding of heritage assets within the planning process. The aim of NPPF chapter 16 is to ensure that local planning authorities, developers and owners of heritage assets adopt a consistent and holistic approach to their conservation and reduce complexity in planning policy relating to proposals that affect them.
- 13.7 On 6 March 2014 the Department for Communities and Local Government (DCLG) launched the Planning Practice Guidance (PPG) web-based resource which was updated in July 2019 to reflect the changes to NPPF since the guidance was first published in 2014. The resource includes a section entitled '*Conserving and enhancing the historic environment*' (ID:18a), which expands upon the corresponding sections of the NPPF.

Local policy

- 13.8 Chapter three of this EIA scoping report identifies the adopted local plans for the study area. Regard will be had to cultural heritage policies and information in these plans.

Relevant guidance

- 13.9 In addition to relevant planning policy, a number of guidance documents have been used and will be used in the cultural heritage and archaeology chapter of the ES.
- *Design Manual for Roads and Bridges (DMRB), 'LA 104 Environmental Assessment and Monitoring' and 'LA 106 Cultural Heritage Assessment'* (January 2020);
 - *Standard and Guidance for Historic Environment Desk-Based Assessment* (Chartered Institute for Archaeologists 2014; revised 2017);
 - *Conservation Principles, Policies and Guidance for the Sustainable Management of the Historic Environment* (Historic England 2008);
 - *Heritage 2020 Framework, Strategic Priorities for England's Historic Environment 2015-2020* (Historic Environment Forum 2015);

- *The Setting of Heritage Assets, Historic Environment Good Practice Advice in Planning Note 3* (Second Edition) (Historic England 2017);
- *Planarch: Evaluation of Archaeological Decision-making processes and Sampling Strategies* (Oxford Archaeology 2001);
- *Planarch 2: Review of Cultural Heritage Covering in Environmental Impact Assessments* (Oxford Archaeology 2005);
- *Kent Farmsteads Guidance* (Kent County Council and English Heritage 2014)
- *South East Research Framework* (SERF - Kent County Council 2019);
- *Specification for a standard desk-based assessment and walkover survey* (Kent County Council; raft);
- *Scheduled Monuments and Nationally Important Non-Scheduled Monuments* (DCMS 2013).

THE 2014 SCOPING OPINION

- 13.10 The Secretary of State's 2014 Scoping Opinion for the London Resort project was informed by comments from Historic England (then English Heritage), Kent County Council Heritage Team, Dartford Borough Council and Gravesham Borough Council. The scoping response provided in 2014 has been taken into consideration during the preparation of this scoping report to address as many of the comments as possible at this stage. A summary of the main topics of comment for each stakeholder is provided in the section below.
- 13.11 The Essex Project Site was not previously within the Order Limits so did not form part of the EIA scoping exercise in 2014.

CONSULTATION FEEDBACK

Historic England

- 13.12 The main points raised by Historic England in response to the 2014 Scoping are summarised below.
- Planning policy and guidance – have regard to the coverage of NPPF and NPPG and DCMS Scheduled Monuments Guidance 2013.
 - Analysis of the setting of heritage assets should use a Zone of Theoretical Visibility (ZTV).

- A multi-disciplinary approach should be used for the EIA.
- Archaeological Character Areas should be used to characterise the site's archaeological significance.
- A preliminary Archaeological Deposit Model should be used to target pre-determination fieldwork and later refined.
- The ES should address sub-tidal and inter-tidal aspects and marine areas potentially affected by the proposals. Historic Seascape Characterisation should also be used. Liaison should be undertaken with Historic England's marine specialists.
- Swanscombe Heritage Park and the church of Saint Peter and Saint Paul should be taken forward as viewpoint. Palaeolithic Sites in Ebbsfleet Valley should be assessed in terms of their landscape legibility.

Kent County Council Heritage Team and Dartford Borough Council

13.13 Dartford Borough Council relied on the advice of the County Archaeologist from Kent County Council's Heritage Team and provided the following comments.

- 'Very high significance' should be used for known sites of international significance. The assessment should include a description of all elements of the cultural heritage resource together with an assessment of their significance.
- Baker's Hole SSSI should be considered under cultural heritage as it is designated for its archaeological and geological value.
- A multi-disciplinary approach should be used for the EIA including air quality (for assessment of indirect effects) and water management (for buried organic remains). The assessment should take into account the effects of mitigation required for other disciplines;
- In respect of guidance documents, it was recommended that Planarch guidance, Kent Farmsteads guidance and the South East Research Framework should be consulted.
- A 1km study area should be employed as a baseline. The Saxon to Modern aspects of the assessment should be expanded. The assessment of the baseline should follow a staged approach including desk-based assessment, geotechnical and archaeological studies to produce a deposit model, archaeological character areas and a field evaluation.
- Heritage interpretation should include the positive effects of the development in terms of site management and heritage interpretation, together with educational skill

and development opportunities. The project provides an opportunity to remove the Baker's Hole monument from the Heritage At Risk Register.

Gravesham Borough Council

13.14 Gravesham Borough Council also relied on the comments from the Kent County Archaeologist but added that additional baseline information would be required for the ES in relation to the industrial development of Swanscombe and Northfleet from the early 19th century. The British Library Online, National Archive and Kent Archive were recommended to be used to this end.

BASELINE CONDITIONS AND MAIN ISSUES

Introduction

13.15 The assessment of the baseline resource will follow a staged approach. A desk-based assessment was undertaken for the Kent Project Site in 2015. This identified a number of designated and undesignated heritage assets in and surrounding the Kent Project Site that had the potential to be affected by the Proposed Development. The desk-based assessment informed the need for further desk-based, non-intrusive and intrusive fieldwork. As part of the forthcoming DCO submission the desk-based assessment will be fully revised and updated, taking into account the addition of the Essex Project Site. A summary of the designated and undesignated heritage assets and further investigations/surveys is provided below.

Designated heritage assets

13.16 Within the Project Site boundary are four Scheduled Monuments, as follows:

- Palaeolithic sites near Baker's Hole, National Heritage List for England (NHLE) No. 1003557 and Site of Special Scientific Interest (SSSI). The Scheduled Monument consists of two areas. One was subject to partial excavation in 1970-71 and revealed rich deposits and artefacts (dated to c.250,000-150,000 Before Present (BP)). The second area was excavated in the 1930s and 1970s. This Scheduled Monument is on the Heritage at Risk Register. The SSSI designation covers a larger area than the Scheduling and has been classified as 'unfavourable declining' by Natural England;
- Neolithic sites near Ebbsfleet, NHLE no. 1004206. The Scheduled Monument consists of two areas, the first being the type-site of the Ebbsfleet Neolithic culture while the second has yielded worked flints of Late Upper Palaeolithic, Mesolithic and Neolithic date;
- Springhead Roman Site, NHLE No. 1005140, lying partially within the southern edge of the Kent Project Site. This Scheduled Monument is currently on the Heritage at Risk Register.

- Medieval Woodland Boundary in Darenth Wood (NHLE No. 1013378). The monument comprises an irregularly shaped earthwork boundary that encloses 35.5 ha of woodland, partially inside the western edge of the Kent Project Site.

13.17 Three Listed Buildings lie within the Project Site;

- Grade II* listed Riverside Station, including floating landing stage, Tilbury (NHLE 1111547);
- Grade II listed Swanscombe Cutting Footbridge Crossing A2 east of A296 Junction (NHLE No. 1119762);
- Grade II listed Boundary Stone, Ingress Park (NHLE No.1410227).

13.18 There are no World Heritage Sites, Grade I Listed Buildings, Registered Parks and Gardens, Conservation Areas or Registered Battlefields within either Project Site. Designated heritage assets are shown on *Figure 14.1*.

Previous archaeological assessment for the London Resort project

13.19 A number of archaeological investigations/surveys have been undertaken to date for the London Resort. These comprise:

- Desk-based assessment (April 2015);
- Historic landscape characterisation (July 2015);
- Archaeological deposit model and characterisation (March 2015);
- Geophysical survey, land south of A2 (detailed gradiometer survey; September 2016);
- Archaeological evaluation (trial trenches and test pitting), land north of Springhead Nursery (July 2017);
- Desk-based assessment and statement of archaeological significance (Palaeolithic) for the main access road (eastern route), and people-mover tram/cycle route options in the Ebbsfleet Valley (July 2017);
- Geophysical survey (partial), Swanscombe Peninsula (electrical resistivity tomography (ERT) and electromagnetic induction (EMI) survey; September 2017).

13.20 Where relevant, intrusive archaeological investigations undertaken in the Kent Project Site for the purpose of other projects are included in the archaeological and historical context section below.

Archaeological and historical context

- 13.21 For the purposes of the baseline, a study area of 1km surrounding the Project Site has been adopted to provide context for the assessment of direct effects to buried archaeological remains and changes to historic landscape. A wider 5km buffer is being used for the assessment of indirect effects resulting from a change within setting for designated heritage assets and built heritage. This will be undertaken in conjunction with the landscape and visual impact assessment for the project, using a Zone of Theoretical Visibility Model.
- 13.22 Both the Essex and Kent Project Sites lie in an area of rich, diverse and significant archaeological heritage. The geology and landscape have been key to the continued use of the area over thousands of years, from its riverine location for food and later transport, to its freshwater supply utilised from the prehistoric period right through to the 19th century. Due to the archaeologically rich nature of the area a summary of the archaeological resource is provided below, which will be expanded upon to inform the EIA.

Prehistoric

- 13.23 The Ebbsfleet Valley and its environs has been a key areas for Palaeolithic research for over a hundred years. Many of the Palaeolithic discoveries have resulted from chalk quarrying since the late 19th century, while further extensive remains were recovered during archaeological works in advance of the construction of the Channel Tunnel Rail Link (CTRL, now known as High Speed 1 (HS1)).
- 13.24 Palaeolithic remains in the Kent Project Site include the internationally important Middle Palaeolithic Levalloisian site of Baker's Hole designated as a Scheduled Monument and SSSI. The Site contains important undisturbed evidence of an early Neanderthal presence in Britain, in horizons that also contain a rich diversity of large mammal bones. These deposits are considered to be of international importance and shed light on early human occupation of the area between 250,000 and 200,000 years ago.
- 13.26 In advance of the CTRL project, archaeological sites were found preserved below alluvial and colluvial deposits, indicating that the Ebbsfleet Valley floodplain has a high potential for Mesolithic and Neolithic activity and for the contemporary environment of the Lower Thames Valley. The valley is also well known as the location of the type-site of a form of Later Neolithic decorated pottery (Ebbsfleet Ware), with a scheduled Neolithic site also located within the Site (Neolithic sites near Ebbsfleet NHLE 1004206 in two parts). The remains of a potential Neolithic skeleton (Galley Hill Man) were discovered within the Kent Project Site during gravel extraction in the late 19th century. At Tilbury docks close to the Essex Project Site an inhumation burial was found in 1883, and later dated to the Mesolithic period.
- 13.27 Bronze Age remains have also been identified in the Kent Project Site including a brushwood trackway at the northern edge of the Swanscombe Peninsula, used for access across the marshland, and another area of brushwood identified at Ebbsfleet Station. Ring

ditches interpreted as possible barrows were discovered along with other pits and gullies of Middle and later Bronze Age date at Springhead.

- 13.28 Late Iron Age activity is recorded in the Kent Project Site close to the Ebbsfleet, and at this time the head of the River Ebbsfleet would have reached almost as far south as the A2. The head of the Ebbsfleet was the ritual focus of Iron Age activity consisting of ritual deposits and a processional way with a terrace which lay upslope, overlooking the river. A large Iron Age enclosure was also recorded in this area but its function remains unknown. To the south of the A2 evidence for a possible settlement dating to the Iron Age was found. However, some of this evidence was interpreted as votive.
- 13.29 The Lower Thames Valley around Tilbury (the Essex Project Site) is one of the richest archaeologically for evidence of the Palaeolithic period. Many finds of flint hand axes and other flint tools and debris have been recovered from gravel terrace deposits bordering the Thames. Peat deposits have yielded significant palaeo-environmental information. The Palaeo-environmental record indicates woodland clearance, cultivation and animal husbandry taking place, which suggests the presence of prehistoric farming settlements close by. The location of the area on the Thames floodplain during the later prehistoric period makes it unlikely that the area was habitable in the later prehistoric period.

Romano-British

- 13.30 During the Roman period a roadside town and sanctuary complex were established at Springhead (although evidence of a ritual site is evident from the late Iron Age). The town was named 'Vagniacis', meaning marshy place. The religious complex was focussed around the head of the Ebbsfleet and consisted of temples, bath houses and a *mansio* (roadside inn) on the northern side of the Roman Road. The Scheduled Monument covers this part of the town south of the Roman Road, which included additional temples and domestic buildings. The Springhead sanctuary site is unique in its density of religious buildings in one place (at least six in total) and is currently the only example from Britain with as many in one place. Springhead is thought to have been a regionally important public cult centre with its position next to Watling Street ensuring its wider appeal and accessibility.
- 13.31 Roman burials have been identified in the Kent Project Site north-west of Springhead nursery. Roman burial practices placed burials outside of the town walls and commonly close to main roads into and out of settlements, such as the walled cemetery close to the A2 (a scheduled monument). A further larger cemetery was located at Pepperhill to the south of the Kent Project Site, which would have served the general population and the visitors to the Sanctuary complex. Other smaller cemeteries were also located in the area.
- 13.32 A roman villa was excavated at Northfleet during the archaeological works for HS1. The villa was in use between the 1st-4th centuries. As well as being a domestic building the villa also had an area for malting and brewing and, due to its proximity to the Ebbsfleet, had its own quay.
- 13.33 It is possible that the area around the Essex Project Site may have been exploited during

the Roman period. A possible settlement or landing place has been identified beyond the 1km Study Area to the east and it is possible that the area might have been utilised for salt working. Roman remains comprising samian ware and fibulae are recorded to have been found at Tilbury Fort, a short distance to the east of the Essex Project Site.

Anglo-Saxon

- 13.34 Burial evidence has been found next to the Kent Project Site to the north-east of Springhead. Saxon cemeteries were typically positioned on higher ground and over 130 burials were recorded during excavations in this area.
- 13.35 An Anglo-Saxon water mill was found on a sand bank at the edge of the Ebbsfleet, preserved within waterlogged deposits. A mill building, revetments, sluice gates and spillway were found, with a millpond to the south fed by the Ebbsfleet and with the mill accessed by a causeway. The mill had a horizontal wheel powered by water. No other buildings were found within the surrounding area and it appears that the mill was quite isolated. However, it is likely that other structures such as a residence and storage building would have been close by, perhaps on the higher drier ground to the south.
- 13.36 Excavations at Springhead revealed a sunken featured building and two corn dryers, one of which contained a 9th century coin. Two other sunken building features were found to the south of the A2 during the widening of the road as well as two Saxo-Norman ditches.
- 13.37 The grade I listed church of St Peter and St Paul located to the west of the Project Site is thought to have had its origins in the Anglo-Saxon period as the base of the tower is dated to the 10th century (NHLE 1085788).
- 13.38 It is likely that the Essex Project Site was marshland throughout the Anglo-Saxon and medieval periods and as such it is unlikely that any settlement occurred in the area during these periods. In 628 Tilbury was recorded as being the location of Bishop Cedda's Palace, located to the north of the 1km Study Area.

Medieval

- 13.39 Swanscombe is thought to mean 'peasants' field' and was recorded as 'Swanes Camp' in Old English. A derivation of this is Sweyne's Camp which is the name given to an earthen mound located to the south of modern Swanscombe. The mound is thought to be a motte - a mound of earth with a flat top upon which a wooden castle is thought to have been constructed.
- 13.40 To the west of Swanscombe peninsula is the site of Ingress Abbey, which had its origins in the medieval period and was first referred to in 1363 when Edward III founded Dartford Priory and endowed it with a farm called Inгрыce. Throughout the medieval period there are references to a ferry, a farm, lime burning and chalk quarrying taking place at the priory. The priory was dissolved by Henry VIII in 1548.

- 13.41 Evidence for medieval woodland management at Darenth can be seen as extant earthworks at the western extent of the Kent Project Site, designated as a Scheduled Monument (NHLE 1013378). The monument comprises an irregularly shaped earthwork boundary that encloses 35.5ha of woodland. The woodland would have been managed to produce wood for burning and as such fuel hungry industries such as limekilns, potteries, brickworks, and iron works grew up within and around the woods.
- 13.42 It is likely that much of the area surrounding the Kent Project Site remained rural throughout the medieval period with the focus on the small settlements established at Swanscombe and Northfleet. It is possible that the reclamation of the marshland on both the Essex and Kent sides of the Thames may have begun in the medieval period continuing into the post-medieval period. The threat of frequent inundation is unlikely to have made these areas unsuitable for settlement despite the reclamation efforts.

Post-Medieval

- 13.43 Tilbury Fort is situated to the east of the Essex Project Site (NHLE 1021092). The blockhouse was the first permanent structure in this location (built 1539) and was part of Henry VIII's campaign to improve coastal defences. After the Dutch Raid Charles II set about improving and reorganising the defences, which involved the demolition of the blockhouse and construction of a new fort and battery in 1670, designed by Sir Bernard de Gomme. The fort is pentagonal in plan with arrowhead-shaped bastions projecting from four of the angles. Tilbury fort is considered to be England's most spectacular surviving example of a late 17th century coastal fort. In conjunction with the batteries on the opposing side of the Thames, the field of fire could span the estuary providing defence of the river and the capital.
- 13.44 During the period of hostility between Britain and France between 1793 and 1815 plans were considered for a naval dockyard on the Swanscombe Peninsula, known as Northfleet Dock. This was considered to be an ideal location for repairing large ships as well as being easily approachable but well protected. The project had a lot of support but the opportunity was taken instead to enlarge and modernise Sheerness Docks and so the plans never came to fruition.
- 13.45 The post-medieval period saw the beginnings of industry combined with the continuation of the rural agrarian character of the area surrounding the Kent Project Site. Historic mapping shows farmsteads and field boundaries have been recorded through excavation. In contrast a brickworks thought to have been in use from the 17th to 19th century is recorded at the western boundary of the Kent Project Site.
- 13.46 It is thought that the former site of the Tilbury Market Place was sited close to the Worlds End Inn located to the east of the Essex Project Site. This was positioned at the point of the post-medieval ferry crossing. The Worlds End Inn is thought to have been constructed in the late 17th or early 18th century and is grade II listed. This is likely to be the building identified as 'Ferry House' on 18th century mapping.

19th Century and Modern

- 13.47 The 19th and 20th century development of Swanscombe was superimposed on a surviving medieval agrarian landscape. This landscape was created through the reclamation of marshlands by the construction of early tidal defences and the laying out of raised causeways (Manorways) radiating north from Lower Road. It is thought that one of these provided access to a ferry to Grays in Essex, first recorded in 1308 and still operating in the 1840s.
- 13.48 Springhead was the first place in Britain to cultivate watercress in artificial beds in the 19th century and is considered to be the birthplace of the modern watercress industry. The watercress beds were established in 1805 and by 1844 formed part of Springhead Gardens, a tourist attraction complete with a tea shop, ornamental bridge, gardens, a zoo, a fortune teller and a museum of Roman artefacts discovered during the excavation of the watercress beds. By 1900 the quarrying in the surrounding area had significantly reduced the water levels, leading to a decline in production and eventual abandonment.
- 13.49 During the 19th century Kent was the focus of the cement industry and a number of works were established at Swanscombe and Northfleet. In 1796 ‘Roman Cement’ was patented at the works at Northfleet by James Parker and in 1811 James Frost patented ‘Portland Cement’ at Swanscombe. Quarrying played a large part in the development of the cement industry in this area and both chalk and clay could be quarried within the near vicinity. As the industry developed river transport became important with the cement works establishing its own wharf and ship building yard at the edge of the peninsula. A network of tramways was also used to transport materials from the quarries to the works and to the wharf, some of which is still evident on the Kent Project Site.
- 13.50 The Tilbury and Riverside Station was first built as part of the London Tilbury and Southend Railway developments of 1854, with a landing stage facility so that rail passengers could join the ferry to Gravesend or other destinations. After the First World War passenger numbers increased and Tilbury became the centre of passenger operations for London. In 1922 an Act of Parliament allowed the construction of a passenger landing stage and this was opened by Prime Minister Ramsay MacDonald in 1930. This structure is now Grade II* listed. The landing stage received the Empire Windrush’s first voyage from the Caribbean in 1948.
- 13.51 An Act of Parliament in 1882 allowed the construction of Tilbury Docks, which were completed by 1886. Access to deep water for shipping had grown in importance and Tilbury was considered to be the ideal location. In 1909 Tilbury became part of the newly established Port of London Authority. During World War Two Tilbury Docks was a target for enemy bombers and a number of air defence installations are recorded in the surrounding area. The adjacent Tilbury Hotel was destroyed by bombing in 1944.

PRELIMINARY ASSESSMENT OF POTENTIAL EFFECTS

Direct effects

13.52 Desk-based assessment and preliminary non-intrusive and intrusive archaeological surveys have identified the presence of known and potential archaeological remains within the Project Sites. Direct effects on heritage assets result from physical damage or disturbance which gives rise to a loss of heritage significance. These range in significance from Internationally/nationally significant remains to locally significant remains. It is anticipated that the likely significant environmental effects to archaeological remains (prior to mitigation) would consist of:

- damage or destruction of known archaeological sites through physical impact or damage to archaeological deposits through dewatering/changes to water levels; and
- damage or destruction of unknown archaeological sites through physical impact or damage to archaeological deposits through dewatering/changes to water levels.

Indirect effects

13.53 The desk-based assessment has identified designated heritage assets and built heritage assets that might experience indirect effects as a result of the Proposed Development. Indirect effects are those which result in potential change to heritage significance but do not give rise to physical damage or disturbance to an asset. In this context, these effects will generally arise through change to the setting of an asset.

13.54 Annex 2 of the NPPF 2019 defines the setting of a heritage asset as *'the surroundings in which a heritage asset is experienced. Its extent is not fixed and may change as the asset and its surroundings evolve. Elements of setting may make a positive or negative contribution to the significance of an asset, may affect the ability to appreciate that significance or may be neutral.'* The setting assessment will be guided by *The Setting of Heritage Assets: Historic Environment Good Practice Advice* in Planning Note 3 (Historic England 2015; revised 2017), which advocates a systematic and staged approach to the assessment of the effects of the development. The indirect effect under consideration is an effect to the significance of a cultural heritage asset caused by the change in the contribution made by the assets setting to its significance, as a result of development within that setting. The potential sensitivity of receptors to the Proposed Development to change within setting will range from local to national significance.

APPROACH AND METHODOLOGY

General approach

13.55 The archaeological and cultural heritage resource comprises all aspects of the historic environment including:

- archaeological remains - above and below ground, including palaeo-environmental remains;
- historic buildings - including historic structures, listed buildings, locally listed buildings and conservation areas;
- the historic landscape - the character of the historic landscape, including field patterns, boundaries and extant historic elements of the landscape;

13.56 Historic England's *Conservation Principles, Policies and Guidance* (2008) provides a comprehensive framework for the sustainable management of the historic environment. Paragraphs 161 and 162 state that (Historic England 2008: 67);

161. Balanced and justifiable decisions about change in the historic environment depend upon understanding who values a place and why they do so, leading to a clear statement of its significance and, with it, the ability to understand the impact of the proposed change on that significance.

162. Every reasonable effort should be made to eliminate or minimise adverse impacts on significant places. Ultimately, however, it may be necessary to balance the public benefit of the proposed change against the harm to the place. If so, the weight given to heritage values should be proportionate to the significance of the place and the impact of the change upon it.

13.57 There is no single accepted or standard guidance for the assessment of the likely effects of development on the archaeological and cultural heritage resource. Although developed for use on trunk road schemes, the *Design Manual for Roads and Bridges* (DMRB 2020, LA 104, Revision 1) sets out a detailed methodology for environmental impact assessment. In conjunction with the *DMRB guidance for Cultural Heritage Assessment* (DMRB 2020 LA106, Revision 1) it is proposed to apply the approach set out in the DMRB to make an assessment of the effects of the Proposed Development on archaeology and cultural heritage. The methodology and criteria will be modified as appropriate to reflect the nature scale and context of the Scheme, taking into account Historic England's *Conservation Principles*. The analysis of the effects of the development upon the significance of heritage assets with regard to their setting will be undertaken using professional judgement and will not rely solely on the use of matrices and scoring systems. This will be presented as a narrative discussion supported by the use of matrices.

13.58 The principal study area established for the assessment of known and potential archaeological and cultural heritage receptors encompasses a 1km radius around the Project Site boundaries. A wider 5km study area was defined in order to assess the potential indirect effects of the Proposed Development on significance. Within this Study Area a viewshed analysis technique will be employed that establishes a Zone of Theoretical Visibility (ZTV) prepared by the project's landscape and visual impact consultant. This will provide a comprehensive assessment of the potential for any significant indirect effects to

occur to designated heritage assets and built heritage assets.

13.59 The archaeology and cultural heritage chapter of the project ES will be prepared as part of a multi-disciplinary approach which will include co-operation and cross references to other environmental topics, including but not limited to landscape and visual impact assessment, soil and ground conditions, ecology, water management (including flood defence), traffic and infrastructure.

Proposed/updated surveys

13.60 As mentioned above some of the baseline studies and investigations have already been undertaken. As part of the EIA some of these studies will need to be updated as outlined below.

- The desk-based assessment will be updated to include the Essex Project Site, changes to the project description, updated policy and guidance, and updates to archaeological and historical baseline since the original document was prepared. This will include preliminary archaeological character areas based upon the existing information at the time of production to inform targeted archaeological fieldwork.
- The deposit model will be updated to include more recent investigations on the Kent Project Site and new archaeological information, and will be extended to cover Essex Project Site;
- Historic landscape characterisation will be extended likewise to cover Essex Project Site and surrounding area;

13.61 In order to fully understand the baseline conditions in addition to the surveys already undertaken, further desk-based and field surveys will be required prior to inform the environmental impact assessment. Subject to access, consultations and approvals, these evaluations might include, but are not limited to, some or all of the following techniques:

- geophysical survey;
- monitoring of geotechnical work across the Project Site to inform the deposit model;
- geo-archaeological borehole analysis and / or test pitting;
- production of a Heritage Statement to assess the impact of the Proposed Development upon the significance of built heritage and designated heritage assets, through change within setting;
- archaeological trial trenching and/ or test pitting to confirm the results of previous stages of survey and /or to detect archaeological sites that could be directly affected by the scheme;

- preparation of a Historic Environment Framework to draw together existing information and surveys undertaken for the DCO submission, along with updated archaeological characterisation areas informed by the additional surveys. This will also provide targeted mitigation for the archaeological works post-consent.

Assessment significance criteria

- 13.62 As noted, the assessment of effects on archaeology and cultural heritage is concerned with direct (physical) effects and indirect (effect to setting) effects. The significance of the effects of the scheme on baseline conditions will be assessed through a process of combining an evaluation of the importance of the cultural heritage resource with the scale of the impact (magnitude of change) that would arise due to the construction and operation of the scheme, taking into account mitigation measures incorporated into the design or delivered during the construction and operational stages.
- 13.63 The importance of cultural heritage assets is analogous to sensitivity and is considered in relation to statutory designations and the priorities or recommendations set out in national research agenda. Historic England's *Conservation Principles* along with professional judgement, will be used to determine the importance/sensitivity of the resource. This will involve an assessment of the specific heritage values of each heritage asset to be affected by the development. In turn this will require careful analysis of certain aspects of heritage significance of an asset that will be affected in order to appreciate the overall effect of a change within setting. In addition to the above the following table will be used as a guide to determine importance/sensitivity.

Table 13.1: Importance/sensitivity of archaeological and cultural heritage receptors

Importance/ Sensitivity	Criteria
Very High	<ul style="list-style-type: none"> • World Heritage Sites inscribed for their archaeological or built heritage qualities. • Undesignated Sites of known international importance or other buildings of recognised international importance. • World Heritage Sites inscribed for their historic landscape qualities. Historic landscape of international importance (designated or not).
High	<ul style="list-style-type: none"> • Scheduled Monuments and undesignated assets of schedulable quality and importance. • Listed Buildings • Designated and undesignated historic landscapes of outstanding interest (including Grade I and Grade II* Registered Historic Parks and Gardens) • Designated historic landscapes of outstanding interest. Undesignated landscapes of outstanding interest. Undesignated landscapes of high quality and importance, and of demonstrable national importance.

Moderate	<ul style="list-style-type: none"> Local Authority designated heritage sites. Previously unknown and undesignated sites that would justify Local Authority designation (i.e. sites of regional importance). Sites with specific and substantial importance to the local community Conservation Areas Historic buildings that can be shown to have exceptional qualities or historical association. Historic townscapes or built-up areas with historic integrity in their buildings, or built setting. Designated special historic landscapes (including Grade II Registered Historic Parks and Gardens). Undesignated historic landscapes that would justify special historic landscape designation. Landscapes of regional importance. Historic landscapes with specific and substantial importance to the wider community.
Low	<ul style="list-style-type: none"> Archaeological assets of limited value, but with potential to contribute to local research objectives. Locally Listed Buildings. Historic (unlisted) buildings of modest quality in their fabric or historical association. Undesignated historic landscapes of local importance. Historic landscape with specific and substantial importance to local interest groups, but with limited wider importance.
Negligible	<ul style="list-style-type: none"> Sites/features that are so badly damaged that too little now remains to justify their inclusion in a higher grade and with no surviving historic content. Buildings that are so badly damaged that too little now remains to justify their inclusion in a higher grade and with no surviving historic content. Landscapes that are so badly damaged that too little now remains to justify their inclusion in a higher grade and with no surviving historic content.
Unknown	<ul style="list-style-type: none"> The importance of the resource cannot be ascertained due to limited existing information; therefore the value of the resource is classified as ranging from High to Low importance/sensitivity. Buildings with some hidden (i.e. inaccessible) potential for heritage significance. The importance of the resource cannot be ascertained due to limited existing information; therefore the value of the resource is classified as ranging from High to Low sensitivity.

Assessment of magnitude of impact

13.64 The assessment of the magnitude of impact is the identification of the degree of the effect of the scheme upon the cultural heritage resource. The magnitude of impact can be positive or negative and is ranked without regard to the importance/sensitivity of the asset. The table below provides a guide for assessing the magnitude of impact in respect of the cultural heritage resource.

Table 13.2: Assessment Criteria for determining the magnitude of Impact

Magnitude		Criteria
Major	Adverse	<ul style="list-style-type: none"> Major physical damage to or significant alteration to a site, building or other feature Extensive change (e.g. loss of dominance, intrusion on key view or sightline) to the setting of a Scheduled Monument, Listed Building or other feature registered as nationally important which may lead to a major reduction in the contribution of setting to the significance of the heritage assets itself and hence a loss of overall significance for that asset. Change to most or all key historic landscape elements, parcels or components; extreme visual effects; gross change of noise or change to sound quality; gross change to air quality; fundamental changes to use or access; resulting in total change to historic landscape character.
	Beneficial	<ul style="list-style-type: none"> Large scale or major improvement of the heritage asset; extensive restoration or enhancement; major improvement of attribute quality
Moderate	Adverse	<ul style="list-style-type: none"> Damage or alteration to a site, building or other feature. Encroachment on an area considered to have high archaeological potential Change in setting (e.g. intrusion on designed site-lines and vistas) to monuments/buildings and other features, which may lead to a moderate reduction in the contribution of that setting to the significance of the heritage assets, and hence a reduced in the asset's overall significance. Changes to many key historic landscape elements, parcels or components; visual change to many key aspects of the historic landscape; noticeable differences in noise or sound quality; noticeable differences in air quality, considerable changes to use or access; resulting in moderate changes to historic landscape character.
	Beneficial	<ul style="list-style-type: none"> Benefit to, or addition of, key characteristics, features or elements or improvements of a heritage asset.
Minor	Adverse	<ul style="list-style-type: none"> Minor damage or alteration to a site, building or other feature. Encroachment on an area where it is considered that low archaeological potential exists. Minor change in setting (e.g. above historic skylines or in designed vistas) of Monuments, Listed Buildings, sites and other features, which may lead to a small reduction in the contribution the setting makes to the significance of the heritage asset with an appreciable loss in the asset's overall

		<p>significance.</p> <ul style="list-style-type: none"> • Change to few key historic landscape elements, parcels or components; slight visual changes to few key aspects of historic landscape; limited changes to noise levels or sound quality; limited changes to air quality, slight changes to use or access; resulting in limited changes to historic landscape character.
	Beneficial	<ul style="list-style-type: none"> • Minor benefit to, or addition of key characteristics, features or elements; some beneficial impact on heritage asset or a reduction in the risk of a negative impact occurring.
Negligible	Adverse	<ul style="list-style-type: none"> • Very minor changes to archaeological materials or building elements • Slight change in setting with very limited change in the contribution that setting makes to the significance of the asset and no loss in overall significance. • Very minor changes to key historic landscape elements, parcels or components; virtually unchanged visual effects; very slight changes in noise levels or sound quality; very slight changes to air quality, very slight changes to use or access; resulting in very small change to historic landscape character.
	Beneficial	<ul style="list-style-type: none"> • Very minor benefit
No Change		<ul style="list-style-type: none"> • No change would be perceptible either positive or negative

Determination of significance of effect

13.65 The assessment of the significance of any effect on a heritage asset is largely a product of the heritage significance of an asset and the magnitude of the effect that might give rise to harm, qualified by professional judgement. An assessment of effects on a heritage asset involves an understanding of the heritage significance of the asset and in the case of an indirect effect, the contribution made by the setting to the heritage significance of the asset. The effect being assessed is whether the asset loses significance due to a reduction in the contribution that its setting makes to significance, as a result of development within that setting. Policy recommends that the level of detail should be proportionate to the heritage significance of the assets and no more than is sufficient to understand the potential impact of the proposal.

13.66 Significance is a product of the sensitivity of the resource and the magnitude of the effect upon it. The significance of the effects of construction and operation of the Scheme will be assessed separately, and residual effects will be assessed taking into account agreed mitigation measures. The overall effects of the Scheme on any part of the cultural heritage resource will be assessed as a combination of the impacts of construction and operation.

13.69 The table below illustrates how the sensitivity of the asset and the magnitude of the impact are combined to produce an assessment of the significance of effect.

Table 13.3: System for assessing significance of effect on heritage assets

		Magnitude of Impact				
		No change	Negligible	Minor	Moderate	Major
Importance/ Sensitivity (Heritage Significance)	Very High	Neutral	Slight	Moderate	Large	Very Large
	High	Neutral	Slight	Moderate	Large	Large
	Medium	Neutral	Slight	Slight	Moderate	Large
	Low	Neutral	Slight	Slight	Slight	Moderate
	Negligible	Neutral	Neutral	Neutral	Neutral	Neutral

PROPOSED AVOIDANCE AND MITIGATION MEASURES

13.67 Scheme assessment and design is being undertaken as an iterative process. Wherever reasonably practicable and appropriate, scheme design would seek to mitigate or avoid potential impacts on archaeological and cultural heritage features. The following aspects of the Proposed Development are likely to have potential cultural heritage effects through ground disturbance and the construction of structures, which might affect significance through changes to setting and the historic landscape character.

- Land remediation works.
- The construction and operation of the Leisure Core on Swanscombe Peninsula, including a range of events spaces, themed rides and attractions, entertainment venues, cinemas, theatres and night clubs, catering, retail and amenity facilities.
- Terrain remodelling, landscape works and planting.
- Provision of car parks.
- The A2 highways works comprising a signalised at-grade gyratory junction to replace existing roundabouts at the A2(T) / B259 Junction.
- The construction and operation of a range of hotels with a combined total of up to c. 3,550 rooms or suites, with one hotel will linked to a waterpark.
- The construction and operation of a conference and convention centre capable of hosting a wide range of entertainment, sporting, exhibition and business events.
- The construction and operation of a technology centre capable of hosting a range of e-Sports and tech conference events.

- The construction and operation of a resort access road, local transport links, people mover and transport interchanges.
- Flood defence and prevention works.
- A ‘back of house’ area accommodating many of the necessary supporting technical and logistical operations to enable the Resort to function.
- Habitat creation and enhancement and public access.
- The provision of service infrastructure including water, electricity and gas supplies, telecommunications and arrangements for water and wastewater treatment and disposal.
- River transport infrastructure on both sides of the Thames, including a floating jetty and ferry terminals and the repair of Bell’s Wharf on Swanscombe Peninsula and potential changes to the grade II* listed Riverside Station and Floating Landing Stage at Tilbury.
- Related Housing, comprising 500 apartments for Resort workers.
- Removal of redundant buildings and other built structures in association with site clearance and demolition works.
- Lighting and nocturnal visual effects during construction works and operation.

13.68 Possible avoidance and mitigation measures might include the following.

- The avoidance of direct impacts to archaeological remains through informed site selection and design. Structures should be designed to minimise below ground impact where possible.
- The use where possible of land that has been previously disturbed or the use of existing infrastructure.
- Appropriate design to reduce or avoid impacts to the setting of designated heritage assets.
- Appropriate design to reduce or avoid physical impacts to the grade II* listed Riverside Station and Landing Stage in Tilbury.
- Where direct impacts cannot be avoided, a programme of archaeological and geo-archaeological investigation prior to development would be designed in consultation with Kent County Council’s heritage team, Essex County Council’s Place Services team and Historic England, in order to mitigate the loss of any remains through the

recording, analysis and publication of the results.

13.69 As well as the potential mitigation measures mentioned above, measures to provide positive effects of the development will also be considered in terms of site management and heritage interpretation, together with educational skills and development opportunities. Scheme assessment and design will be undertaken as an iterative process. Wherever possible, scheme design would seek to mitigate and remove potential impacts on archaeological and cultural heritage features.

UNCERTAINTIES

13.70 At present the development proposals have not been finalised and as such the effects of the Proposed Development upon cultural heritage and archaeological receptors are not known with certainty and might be subject to change. As the development proposals are refined, so will the assessment of effects.

13.71 The archaeological work is ongoing and it might be that the proposed surveys and assessment will need to be adjusted or refined on the basis of new information that arises or other matters that become apparent. The desk-based studies undertaken to date are predictive and do not provide a definitive understanding of as-yet unrecorded archaeological heritage assets that may be affected by the Proposed Development.

MATTERS TO BE SCOPED OUT

13.72 At this stage, no cultural heritage and archaeology topics are proposed to be scoped out of the assessment. However, this position might change in light of further baseline work and design development.

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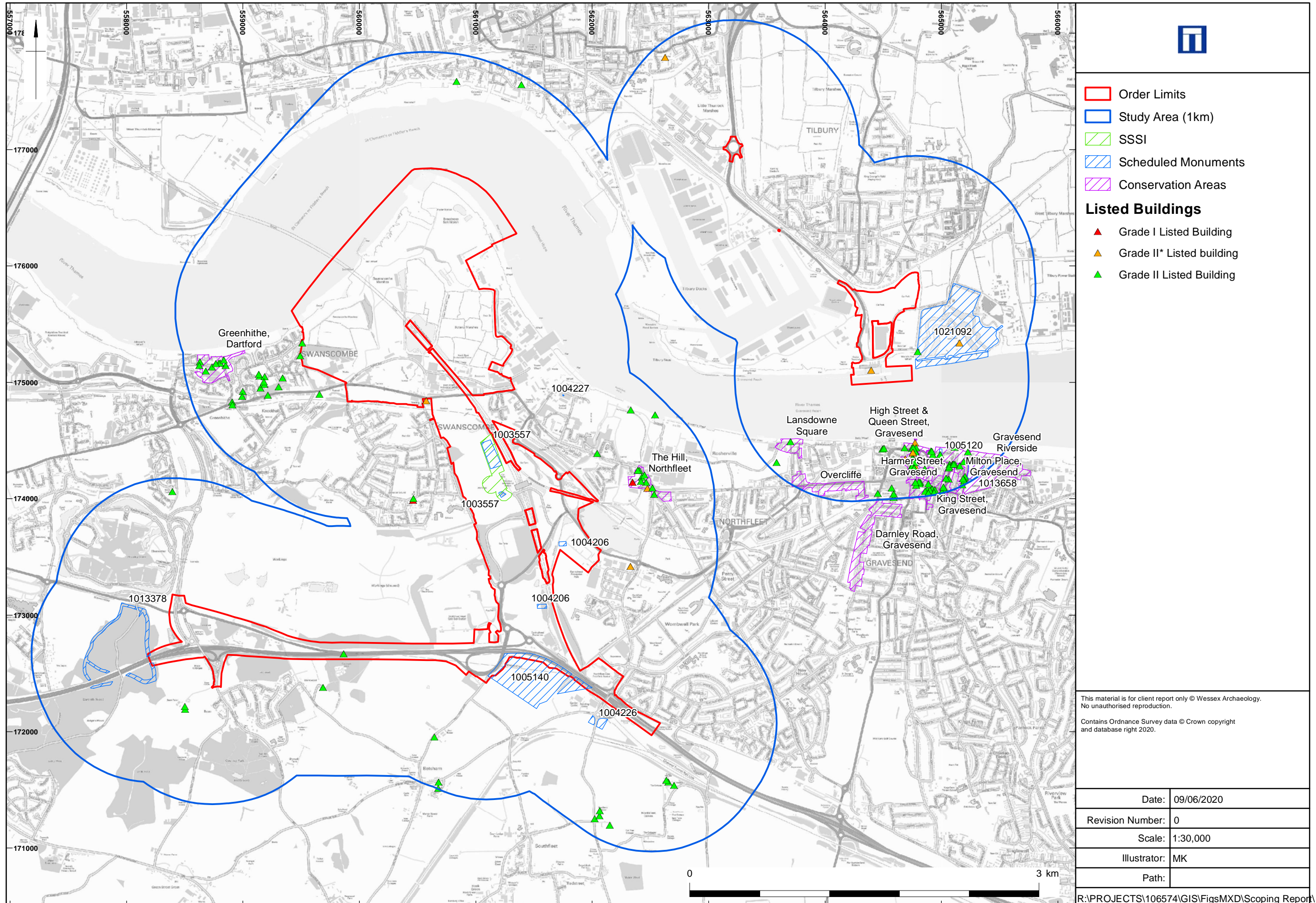
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- Order Limits
 - Study Area (1km)
 - SSSI
 - Scheduled Monuments
 - Conservation Areas
- Listed Buildings**
- ▲ Grade I Listed Building
 - ▲ Grade II* Listed building
 - ▲ Grade II Listed Building

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The Project Site and Designated Heritage Assets within the 1km Study Area (based on NHLE and KHER)

Figure 13.1

Fourteen ◆ Noise and vibration

INTRODUCTION

- 14.1 This chapter considers the assessment of the noise and vibration associated with the Proposed Development. Higher levels of noise can affect human health as well as having negative impact on wildlife and the enjoyment of both built and natural environments.
- 14.2 'Noise' in the context of this assessment is taken to include any unwanted tactile vibration as well as audible noise. For clarity, the terms 'noise' and 'vibration' are used throughout the assessment to distinguish between the two aspects of 'noise'.
- 14.3 The movement of people on and off the Project Site through road, rail and ferry traffic will have the potential to affect noise and vibration levels in and around the Project Site. In addition, the noise and vibration caused by the construction and operation of facilities and plant on the Project Sites needs to be included in the assessment of noise impact.
- 14.4 The assessment of noise and vibration will be undertaken in coordination with parallel work on the prediction of future traffic flows (road, rail and ferry) in the EIA for the London Resort.
- 14.5 Assessment of noise and vibration will be undertaken for both construction (including decommissioning) and operational phases of the development. Construction and demolition will give rise to both noise and vibration, although the propagation distance of the latter will be more limited. Construction traffic will also give rise to noise and vibration.
- 14.6 Sensitive receptors are located where noise or vibration can have a negative impact on humans, wildlife or ecologically sensitive sites including residential properties, schools and care homes in the vicinity of the Project Site, and residential properties, schools and care homes located along roads leading to the Project Site and affected by the operation of the Proposed Development;
- 14.7 In respect of ecological receptors, due to attenuation resulting from distance, only ecologically sensitive designated sites within 200m of the Project Site will be assessed. The West Thurrock Lagoon and Marshes SSSI is outside of this zone, but the Swanscombe Skull Site SSSI and Baker's Hole SSSI will be taken into account in the assessment.

RELEVANT LAW, POLICY AND GUIDANCE

- 14.8 The following relevant law, policy and best practice guidance will be taken into account:

National Policy Statements

14.9 National Policy Statements set out the need for and government's policies to deliver Nationally Significant Infrastructure Projects (NSIPs) in England. Chapter three of this scoping report explains that there is no NPS for business and commercial NSIP projects. However, to the extent that the Project includes transport and highways infrastructure, regard will be had to relevant policy in the NPS for National Networks, including:

- Environmental and social impacts (NPS paragraphs 3.2 to 3.5);
- Criteria for 'good design' for national network infrastructure (NPS paragraphs 4.28 – 4.35);
- Pollution control and other environmental protection regimes (NPS paragraphs 4.48 – 4.56);
- Noise and vibration (NPS paragraphs 5.186 – 5.200).

Other national law and policy

14.10 The assessment will have regard to relevant provisions in the following:

- Sections 60 and 61 of the Control of Pollution Act 1974;
- Section 10 of the Compulsory Purchase Act 1965
- The Land Compensation Act 1973 Part 1
- The Noise Insulation Regulations 1975 (amended 1988);
- The Noise Policy Statement for England 2010;
- The National Planning Policy Framework 2019.

Technical guidance and best practice documents

14.11 The assessment will use the following technical guidance and best practice documents:

- British Standard BS5228-1:2009+A1:2014 '*Code of practice for noise and vibration control on construction and open sites – Part 1: Noise*'.
- British Standard BS5228-2:2009+A1:2014 '*Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration*'.
- Design Manual for Roads and Bridges (DMRB), LA111, 2020, '*Noise and vibration*'.

- *Calculation of Road Traffic Noise (CRTN)*, Department of Transport, 1988.
- IEMA Guidance Note No 1, '*Guidance for the environmental assessment of road traffic*', 1993.
- British Standard BS4142:2014+A1:2019, '*Methods for rating industrial noise affecting mixed residential and industrial areas*'.
- British Standard BS7445-1:2003, '*Description and measurement of environmental noise. Guide for quantities and procedures*'.
- World Health Organisation, '*Guidelines for community noise*', 1999.
- World Health Organisation, '*Night noise guidelines for Europe*', 2009.

Local policies and plans

14.12 The assessment will also consider the following locally relevant policy and guidance:

- Kent County Council Environment Strategy (Kent State of the Environment 2015).
- Dartford Development Policies Plan, adopted 2017. Policy referencing Noise: DP5, DP7, DP9, DP20, DP22. Dartford Core Strategy Document contained no relevant policy.
- Gravesham Local Plan Core Strategy, adopted 2014. Policy relevant to new development noise creation – CS19.
- Thurrock Core Strategies and Policies for Management of Development, January 2015. Noise guidance contained within Sections PMD1, PMD6, PMD9 (Core Strategy) superseded the 1997 Borough Local Plan in 2011/12.

THE 2014 SCOPING OPINION

14.13 The Secretary of State's 2014 scoping opinion for the London Resort offered a series of recommendations pertinent to the assessment of noise and vibration. These are identified in table 14.1 (overleaf) and are noted and reflected in the current scoping report.

Table 14.1: Scoping opinion and response

Paragraph number in the 2014 Scoping Opinion	Scoping Opinion Comment
3.60	<p>The Secretary of State recommends that the methodology and choice of noise receptors should be agreed with the relevant local environmental health officers within local planning authorities, and other relevant consultees (e.g. the EA, NE or the Ebbsfleet Development Corporation) as required. The Secretary of State draws attention to the responses from DBC and GBC regarding the criteria and standards applied in the assessment and the need to agree baseline and methodology.</p> <p>Proposed action: the noise modelling methodology and choice of noise receptors will be agreed with the relevant consultees.</p>
3.61	<p>The Secretary of State notes the proposed methodologies for predicting and assessing potential noise and vibration impacts. The Scoping Report does not however explain the proposed method of assessing the potential noise impacts (e.g. cheers, shouts and entertainment/music) generated by the proposed rides, attractions and event spaces in the development. This information should be provided in the ES, with reference to the methodologies used for other similar types of developments in England. Consideration may also need to be given to existing sources of noise and vibration in the area and any impact they may have on the proposals, for example (as for air quality) existing wharves as highlighted by the PLA.</p> <p>Proposed action: the methodology will include consideration of the potential noise impacts generated by the proposed rides, attractions and event spaces.</p>
3.62	<p>The Scoping Report illustrates the proposed general location of various components of the project; however, the potential impacts and receptors could vary according to the characteristics (e.g. design, size, configuration) of the components (including the rides/attractions) at any given time. The assessment should therefore describe and assess the impacts based on the proposed maximum development parameters. The ES should also explain clearly how proposed DCO requirements control potential impacts within the assessment parameters.</p> <p>Proposed action: this will be included in the assessment.</p>
3.63	<p>Potential noise sources during construction and operation should be clearly described. The ES should also describe the potential receptors for these impacts and how these might vary with potential changes to the design/configuration of the project following commencement.</p>

	Proposed action: this will be included in the assessment.
3.64	<p>The ES should describe the types of vehicles and plant to be used during the construction phase and assess the characteristics of impacts (e.g. type and magnitude) that these would generate. This should include an assessment of the proposed piling works. The assessment should be informed by the anticipated working hours of the construction phase, and these should be subject to agreement from the local authorities.</p> <p>Proposed action: this will be included in the assessment.</p>
3.65	<p>The noise and vibration assessments should take account of potential traffic movements along access routes, especially during the construction phase. The results from the noise and vibration assessments will also provide information to inform the ecological assessments therefore, the ES should include cross-referencing to relevant chapters/appendices as appropriate. Noise and vibration levels from works along the foreshore of the River Thames (potentially affecting birds and marine ecology) should be assessed.</p> <p>Proposed action: this will be included in the assessment.</p>
3.66	<p>The ES should describe clearly the proposals for mitigating potentially significant adverse effects, and the Secretary of State's viewpoint in this regard is echoed by comments provided by DBC regarding the need for detailed proposals for mitigation and a detailed consideration of residual effects. This should include consideration of how noise complaints during construction and operation could be monitored.</p> <p>Proposed action: this will be included in the assessment.</p>

CONSULTATION FEEDBACK

14.14 The consultation feedback received to date is summarised in Table 14.2.

Table 14.2: Consultation feedback relating to noise and vibration

Organisation	Consultation feedback
Dartford Borough Council	DBC recognises that it is difficult to obtain an accurate picture. With careful monitoring it is clear that overall noise can be managed for the construction phase. Noise officer recommends that most effective way of dealing with

	<p>potential noise issues is to divide the activity into construction phases or areas and have noise controls relevant to the phase or area and its likely effect on local residents or businesses. Noise and vibration assessment should not confine itself to one form of piling only.</p> <p>Proposed action: the construction noise assessment will be based on the proposed phasing of construction.</p>
Thurrock Council	<p>Lack of clarity between statements of a predominantly indoor resort and the flexibility sought within draft PEIR development description and DCO. There has not been appropriate consideration of the nature of "screams" from rides and how noise travels across water. The noise assessment must model the maximum noise levels rather than average noise levels, would also utilise monitoring stations in Thurrock.</p> <p>Proposed action: maximum noise levels from rides (including screams) will be modelled. This modelling will include consideration of how sound travels across the Thames.</p>
Highways England	<p>The noise and vibration assessment methodology must contain sufficient data to provide confidence that the model to be used is fit for purpose. Assurance should be given that the model is set up to calculate road traffic noise in accordance with the methodology set in DMRB.</p> <p>Proposed action: the PEIR will include a full description of the noise modelling, assumptions and guidance utilised (DRMB and others)</p>
High Speed 1	<p>Construction activities and the permanent solution for resort and transport link should not create any noise, fumes or other air quality issues for travelling public or for safe operation of stations and railway assets. Vibration from driven piles or ground improvement.</p> <p>Noted.</p>

BASELINE CONDITIONS AND MAIN ISSUES

The Kent Project Site

14.15 The baseline noise environment in and around the Kent Project Site includes contributions from the following sources of noise:

- Road traffic noise using the existing principal east-west routes past the Kent Project Site: the A226 London Road to the north and the A2(T) to the south.
- Road traffic using the principal north-south route past the Kent Project Site: the B259 Stanhope Road and the B2175 Dover Road.

- Rail traffic on the east west network rail lines serving Greenhithe, Swanscombe and Northfleet stations.
- Rail traffic on the high speed (HS1) rail lines serving (and passing through) Ebbsfleet International Station.
- Sources of industrial noise to the west of Swanscombe Marshes off Lower Road / Manor Road.
- Sources of industrial noise south of Swanscombe Marshes and north of London Road off Manor Way.
- Road traffic noise from local roads.
- Marine traffic on the Thames.
- Existing wharves on the Thames.
- Occasional aircraft overflight.

14.16 The Baseline vibration environment in and around the Kent Project Site includes contributions from:

- Rail traffic on the east west network rail lines serving Greenhithe, Swanscombe and Northfleet stations.
- Rail traffic on the HS1 railway, including noise associated with trains stopping at Ebbsfleet International Station.
- Road traffic (including that servicing local industrial premises).

The Essex Project Site

14.17 The baseline noise environment in and around the Essex Project Site includes contributions from the following sources of noise:

- Road traffic noise using the existing principal north-south route past the site: the A1089.
- Road traffic noise from local roads.
- Rail traffic on the east-west network rail lines serving Tilbury Town station.
- Sources of industrial noise to the west of the Kent Project Site including the Cemex

Tilbury cement and ash works.

- Marine and wharf noise associated with Tilbury Docks.
- Marine traffic on the Thames.
- Occasional aircraft overflight.

14.18 The Baseline vibration environment in and around the Kent Project Site includes contributions from:

- Rail traffic on the east west network rail lines serving Tilbury Town station.
- Road traffic (including that servicing local industrial premises).
- Local industrial sites

General considerations

14.19 Baseline noise data will be collected at key locations, at appropriate times, with the agreement of relevant Environmental Health Officers from local planning authorities and other relevant consultees (for example; the Environment Agency, Natural England and the Ebbsfleet Development Corporation) as required.

14.20 This data will be used, along with the road traffic count and composition data, to calibrate a 3D acoustic model of the baseline noise in and around the Project Site. The noise survey methodology will comply with the requirements of BS 7445-1:2003 '*Description and measurement of environmental noise. Guide for quantities and procedures*'..

14.21 Baseline vibration data will be collected alongside the key sources of ground-borne vibration (railways and roads serving particularly heavy vehicles) and predictions made of the distance over which such vibration decays to below general ambient levels.

PRELIMINARY ASSESSMENT OF POTENTIAL EFFECTS

14.22 The potential likely significant effects arising from the construction phase and operational phase of the development that will be addressed in the assessment are as follows.

- Effects from noise and vibration generated during the construction phase, including from earthworks, demolition, piling and general construction on noise or vibration sensitive receptors. These receptors will be identified through consultation with relevant local environmental health officers within local planning authorities and other relevant consultees (e.g. the Environment Agency, Natural England or the Ebbsfleet Development Corporation) as required.

- Effects on noise sensitive receptors from noise (or vibration) generated during the operational phase including from cheers, shouts and entertainment music generated by the proposed rides, by the movement of vehicles on, off or around the Project Site and by items of fixed plant as required to service the operation.
- Effects from noise and vibration generated during construction and operational phase of the development on nearby ecological receptors.
- Effects of water-borne noise on marine life.
- The potential for cumulative effects to take place as a result of the Proposed Development and other cumulative developments, during construction and operation.

14.23 Existing noise sensitive receptors located along the main access roads to the Kent and Essex Project Sites, and along roads that will see significant increases in traffic flows, will have the potential to be impacted by transportation noise.

14.24 Any on-site noise sensitive receptors (such as hotels) also have the potential to be affected by operational noise more generally.

APPROACH AND METHODOLOGY

Construction phase

14.25 Construction activities will give rise to noise which will be predicted at chosen receptor locations to be agreed with the relevant local authorities, using accepted modelling techniques and industry standard source sound-level data. This will follow guidance on construction noise within British Standard BS5228-1:2009+A1:2014, *'Code of practice for noise and vibration control on construction and open sites – Part 1: Noise'*.

14.26 Procedures described in Department of Transport / Welsh Office Memorandum *'Calculation of Road Traffic Noise'* (1998) will be used for calculating and measuring road traffic noise due to construction activities.

14.27 Construction activities will give rise to tactile, ground-borne vibration which will be predicted at chosen receptor locations to be agreed with the relevant local authorities, and other relevant consultees (for example; the Environment Agency, Natural England and the Ebbsfleet Development Corporation) as required, using accepted modelling techniques and industry standard source data. This will follow guidance on construction vibration within British Standard BS5228-2:2009+A1:2014, *'Code of practice for noise and vibration control on construction and open sites. Vibration'*.

Operational phase

- 14.28 Guidance on the impact assessment of noise from traffic moving to, from and within the Proposed Development is provided in the IEMA Guidance Note No. 1 *Guidance for the Environmental Assessment of Road Traffic*. The document recommends assessment where traffic flows will increase by more than 30% (or the number of heavy goods vehicles will increase by more than 30%), and where specifically sensitive areas experience traffic flow increases of 10% or more. The guidance indicates that projected changes in traffic of less than 10% create no discernible environmental noise impact.
- 14.29 The noise readings from road traffic will be undertaken in line with the procedures set out in the Design Manual for Roads and Bridges (DMRB), LA111, 2020, *'Noise and vibration'* and in the Department of Transport / Welsh Office Memorandum *'Calculation of Road Traffic Noise'* (1998)
- 14.30 Guidance on the impact of fixed items of plant is given in BS4142:2014+A1:2019. The assessment parameter is the 'rating level' LR of the plant noise assessed at the position of residential properties compared with the 'background' level L_{A90} .
- 14.31 There is no single relevant published source of guidance on the assessment of noise from cheers, shouts and entertainment music generated by the proposed rides and attractions. The methodology for the assessment will be identified through consultation with relevant local environmental health officers within local planning authorities and other relevant consultees (for example the Environment Agency, Natural England or the Ebbsfleet Development Corporation) as required and based on professional judgement.
- 14.32 Noise (and vibration as necessary) will be forecast at agreed sensitive receptors for the following scenarios:
- Baseline (2020);
 - Future opening year baseline *without development* (Year to be determined);
 - Future opening year *with development* (Year to be determined).
- 14.33 Cumulative effects will be assessed, with traffic data accounting for committed developments. Other proposed developments/activities that might have a cumulative effect upon noise or vibration will be considered following consultation with relevant stakeholders.

Assessment significance criteria

- 14.34 The National Planning Policy Framework 2019 (NPPF) is the overarching planning policy document that applies to all new development and infrastructure projects in England. The guidance and assessment criteria given (or referred to) in this document can, therefore, be applied to all other standards in terms of assessing the suitability of accepting a

development consent order with respect to noise impact.

14.35 The NPPF (para 180) states that planning policies and decisions should aim to:

- *‘mitigate and reduce to a minimum potential adverse impact resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life’; and*
- *‘identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.’*

14.36 With specific reference to noise impact, the NPPF refers in paragraph 180 to the Noise Policy Statement for England 2010 (NPSE). The NPSE provides guidance that enables decisions to be made regarding the acceptable noise burden to place on society, using three key measures – the No Observed Effect Level (NOEL), the Lowest Observed Adverse Effect Level (LOAEL) and the Significant Observed Adverse Effect Level (SOAEL).

14.37 In order to provide a consistent frame of reference (and to allow a view to be taken on the suitability of the application with reference to the relevant planning guidance), the levels or criteria given in other relevant documents used in the assessment will be re-framed in the assessment as shown in Table 14.3.

Table 14.3: Definition of effect levels adopted from the Noise Policy Statement for England (2010)

Effect Level	Description
NOEL	The NOEL is the level of noise impact below which no effect can be detected, and there would be no discernible negative effect on health or quality of life.
LOAEL	The LOAEL is the lowest level of noise impact above which adverse effects on health or quality of life can be detected. Designing noise impacts to be equal-to-or-less-than, the LOAEL should see that any adverse effects on health or quality of life are negligible.
SOAEL	The SOAEL is the level above which significant adverse effects on health and quality of life occur. Designs should always seek to avoid a noise impact, which would be categorised as a SOAEL.

14.38 For each noise or vibration sensitive receptor and for each type of construction and operation noise or vibration, a noise or vibration level will be assigned for the NOEL, LOAEL and SOAEL effects level. These assignments will be agreed through consultation with relevant local environmental health officers within local planning authorities and other relevant consultees as required.

PROPOSED AVOIDANCE AND MITIGATION MEASURES

Construction phase

14.39 Noise and vibration from construction activities can be controlled effectively with a combination of appropriate zoning and phasing or work coupled with effective noise and vibration monitoring against agreed action levels. Where noise or vibration exceeds these trigger levels, mitigation is put in place.

14.40 The mitigation measures for the construction phase are likely to include site-wide measures to limit the generation of noise and vibration. The mitigation measures are like to include best practice measures recommended in British Standard BS5228-1:2009+A1:2014 '*Code of practice for noise and vibration control on construction and open sites – Part 1: Noise, Part 2 Vibration*'.

14.41 These measures will focus on the following key areas:

- plant requirements at each phase of the construction (earthworks, earthworks, demolition, piling and general construction);
- construction phasing;
- predictions of noise and vibration at sensitive receptors without mitigation in place;
- residual impacts once proposed mitigation is in place.

14.42 The mitigation measures are likely to include a combination of both hard measures (e.g. plant selections, noise barriers and earth bunds) and soft and administrative measures (e.g. ensuring complain logs are kept and made available to the local authority).

Operational phase

14.43 The sources of operational noise will be from cheers, shouts and entertainment/music generated by the proposed rides, attractions and event spaces and from transport movements to, from and within the Project Site.

14.44 On-site designed-in mitigation measures might include the use of:

- careful planning of the Project Site massing to carefully consider the distance of rides, attractions and event spaces away from nearby noise sensitive receptors.
- non-noise sensitive facilities to screen noise sensitive receptors from rides, attractions and event spaces.
- lower noise fixed plant or the application of plant noise attenuation.

- noise barriers.

14.45 Other mitigation measures might include:

- Encouraging use of more sustainable and lower noise transport to visit the Project Site. Examples such as electric vehicles and cycling reduce noise levels.
- Park and ride schemes can reduce overall noise levels although they can create noise in their own localities and this would need to be assessed.

UNCERTAINTIES

Construction phase

- 14.46 A number of components contribute to the uncertainty of modelling predictions. The construction road traffic noise model used in this assessment is dependent upon the traffic data that have been input, which will have inherent uncertainties associated with them.
- 14.47 There are additional uncertainties on the selection of plant for the different construction activities. To reduce the uncertainties, typical selections will be made based on guidance in British Standard BS5228-1:2009+A1:2014 *'Code of practice for noise and vibration control on construction and open sites – Part 1: Noise, Part 2 Vibration'*.
- 14.48 There are uncertainties on construction phasing, which means that early constructions may provide noise screening to some noise sensitive receptors later in the construction sequencing. Any assumptions on construction phasing employed in the modelling will be made explicit.
- 14.49 There are uncertainties around the noise resulting from the loading or unloading of barges.

Operational phase

The operational road traffic noise model used in this assessment is dependent upon the levels of traffic data that have been input. This will have inherent uncertainties associated with the methods used to predict traffic flow quantities (see transport chapter for further information). As the base year model (2019) has been verified using measured noise survey data, there can be justifiable confidence in this prediction.

- 14.50 The noise from river traffic associated with conveying visitors to the Project Site will be assessed.
- 14.51 Noise from cheers, shouts and entertainment/music generated by the proposed rides, attractions and event spaces will be dependent to some degree on the final selection and design of facilities, their placement and orientation on the Project Site.

- 14.52 The noise produced from train movements is dependent upon the frequency of services. This is subject to variability based on future alterations to the frequency and distribution of timetabled services.
- 14.53 For all of the above, sensitivity analyses will be undertaken to establish the influence of these uncertainties on the final assessment. Assumptions will be modified accordingly to ensure a robust assessment of the worst-case impacts.
- 14.54 The assessment will be based on the results produced through a noise modelling exercise, which provides predictions on the likely future noise levels. Typically, an uncertainty within a range of approximately +/- 3 dB could be expected from computer noise modelling software. This uncertainty will be controlled as far as practicable by cross-referencing the levels of predicted noise impact against the spot measurements captured on the Project Site.

MATTERS TO BE SCOPED OUT

- 14.55 There have been no topics scoped out with respect to the noise assessment.

Chapter Fifteen ◆ Air quality

INTRODUCTION

- 15.1. This chapter considers the potential air quality effects associated with the Proposed Development.
- 15.2. Direct and indirect emissions associated with the Proposed Development will have the potential to affect local air quality during both the construction (including decommissioning) and operational phases of the development. The study area will include the Project Site (i.e. the Kent Project Site and Essex Project Site) and also areas in the vicinity of the Project sites and bordering the roads most affected by construction and operational traffic.
- 15.3. Sensitive receptors are considered in relation to locations which have relevant exposure to national air quality objectives, and include:
- residential properties, schools and care homes in the vicinity of the Project sites;
 - residential properties, schools and care homes located along roads leading to the site and affected by the construction and operation of the development;
 - ecologically sensitive designated sites within 2km¹ of the Proposed Development, including the West Thurrock Lagoon and Marshes, Swanscombe Skull Site and Baker's Hole SSSIs.
- 15.4. Construction and demolition activities will give rise to dust and particulate matter (PM₁₀) emissions that have the potential to affect local air quality. Traffic generated by the construction phase of the development will also give rise to increased pollutant concentrations of nitrogen oxides (NO_x) and particulate matter, as would any combustion processes that take place during this phase.
- 15.5. The operation of the Proposed Development will lead to potentially significant increases of local traffic and in turn an increase in pollutant concentrations, affecting local air quality.
- 15.6. The energy strategy of the Proposed Development is yet to be finalised, but it is planned that the demand of the Project Site will be predominantly met by water sourced heat pumps, with gas fired combustion plant being used for back up and top up. Emissions from any combustion plant have the potential to cause significant long and short-term air quality effects for on-site receptors and existing receptors in the surrounding area.

¹ As outlined in IAQM Guidance (2020) A guide to the assessment of air quality impacts on designated nature conservation sites. [URL](#)

RELEVANT LAW, POLICY AND GUIDANCE

National Policy Statements

15.7. National Policy Statements set out the need for and government's policies to deliver Nationally Significant Infrastructure Projects (NSIPs) in England. Chapter three of this scoping report explains that there is no NPS for business and commercial NSIP projects. However, to the extent that the Project includes transport and highways infrastructure, regard will be had to relevant policy in the NPS for National Networks, including:

- Environmental and social impacts (NPS paragraphs 3.2 to 3.5);
- Emissions (NPS paragraphs 3.6 to 3.8);
- Climate change adaptation (NPS paragraphs 4.36 – 4.47);
- Pollution control and other environmental protection regimes (NPS paragraphs 4.48 – 4.56);
- Health (NPS paragraphs 4.79 – 4.82);
- Air quality (NPS paragraphs 5.3 – 5.15);
- Carbon emissions (NPS paragraphs 5.16 – 5.19);
- Dust, odour, artificial light, smoke, steam (NPS paragraphs 5.81 – 5.89).

Other law, policy and guidance

15.8. The assessment will also take into account the following:

- The National Planning Policy Framework 2019.
- The 2008 Ambient Air Quality Directive.
- The National Air Quality Strategy.
- Part IV of the Environment Act 1995.

15.9. The assessment will use the following technical guidance and best practice documents:

- Defra's Local Air Quality Management (2018), Technical Guidance (TG16).
- Institute of Air Quality Management (IAQM) (2014), Guidance on the assessment of dust from demolition and construction,

- Institute of Air Quality Management (IAQM) (2017), Land-use Planning and Development Control- Planning for Air Quality.
- Institute of Air Quality Management (2019) A guide to the assessment of air quality impacts on designated conservation sites. Institute of Air Quality Management.

15.10. The assessment will also consider the following locally relevant policy and guidance:

- Gravesham, Thurrock and Dartford Local Plans and Development Frameworks.
- Thurrock Air Quality Action Plans (Tilbury, Purfleet by-pass, Avele and Transport).
- Dartford Air Quality Action Plans (A282 Tunnel Approach and Dartford Town).
- Gravesham Air Quality Action Plan (A2 Trunk Road).
- Kent and Medway Air Quality Partnership- Air quality and planning technical guidance.

THE 2014 SCOPING OPINION

15.11. The scoping opinion from the 2014 submission was largely in agreement to the scope outlined with some minor comments and additions which are outlined below and taken into account in this scoping report.

Table 15.1: Relevant advice in the 2014 scoping opinion and the Applicant’s response

Paragraph in Scoping Report	Scoping opinion comment	Response
3.52	A full study area, inclusive of the full road network impacted, was presented or described in the report.	Traffic modelling is required to identify the full study area which will be shared and agreed with the local authorities and the results presented in the ES. All sensitive receptor locations will be agreed with the relevant local authorities.
3.53	Full parameters of the energy centre must be presented in the ES and the following types of emissions from the energy centre should be included; dust generated during construction, traffic related emissions during construction and operation and emissions	Noted and reflected in this scoping report.

	from any proposed combustion processes (including any visible plumes).	
3.54	The assessment must have regard to the potential requirements of any other regulatory regimes relevant to the energy centre.	Noted and reflected in this scoping report.
3.55	Emissions at both on and off-site locations during construction and operational phases should be considered, including along access roads and local footpaths.	Noted and reflected in this scoping report.
3.56	The Secretary of State recommends that worst case scenarios are assessed.	Noted and reflected in this scoping report.
3.57	The potential impact on nearby sensitive habitats and designations due to an increase in air quality pollutants should be considered in the EIA.	Sensitive habitats and designations relevant to air quality changes are identified in this report.
3.59	Consideration should be given to appropriate mitigation measures and to monitoring of dust and odour complaints.	Noted. Appropriate mitigation measures will be proposed where necessary.

CONSULTATION FEEDBACK

15.12. There have been several rounds of consultation for the Proposed Development, with key stakeholders and local authorities. The full consultation query and response is presented in Table 15.2.

Table 15.2: Relevant feedback from 2015 consultation, and Applicants Response

Stakeholder	Consultation Feedback Summary	Response
Public Health England	Generally satisfied with the proposed methodology would expect to see that detailed quantitative and cumulative assessments proposed are undertaken and provided. Will provide further comments on air quality when results are available. Advises that GLA Best Practice Guidance " <i>The Control of Dust and Emissions from Construction and Demolition</i> " was revised in 2014. Current proposals do not appear to consider possible health impacts of Electric and Magnetic Fields will need to demonstrate these have been considered in	A human health risk assessment, relating to land contamination, will form part of the interpretative reporting which is to follow the current intrusive ground investigation, and this will form an appendix to the DCO ES Soil and Ground Conditions Chapter. Further human health quantitative risk

	<p>the final submission. Recommends that any issues relating to potential impacts on public health should be summarised in a specific section of the report.</p>	<p>assessment(s) will be undertaken (this will link into the Human Health chapter of the scoping report and the new guidelines on HIA required for DCOs) as the design develops / evolves to ensure no unacceptable risks are presented to the end users of both the Project Site and adjacent sites.</p>
<p>Dartford Borough Council</p>	<p>Needs information from transport modelling to fully assess impact on air quality. Many areas around the Project Site are currently undeveloped limiting the need for an air quality assessment this could change as more development is built out. A list of receptors needs to be agreed with the local authorities. Suggested that emissions will arise from the proposed energy centre affecting occupants of hotels on the Swanscombe Peninsula, the potential locations in the work plans need to be fully assessed.</p> <p>AQMA may be required if all permitted residential development is built out.</p> <p>Potential emissions from energy centre should be assessed.</p>	<p>Agreed.</p>
<p>Environment Agency</p>	<p>Requested details about the specifications of the proposed energy and waste facilities as they may require an Environmental Permit which may place restrictions on pollution.</p>	<p>Waste: The applicant is taking into consideration the need and requirements for any permits in relation to the provision of any waste permitted activities</p> <p>Air quality: Noted.</p>
<p>Thurrock Council</p>	<p>Thurrock requires air quality modelling of the current and proposed AQMA's in Thurrock to be assessed in light of traffic modelling for the Dartford Crossing, M25 Junctions and A13.</p>	<p>Noted.</p>

Gravesham Borough Council	<p>Three sources of air pollution related to the development, the construction phase, traffic and energy generating facility. List of sensitive receptors to be modelled in the locality and further afield needs to be agreed with LA's. With the access road located in a cutting there is concern that the pollution from idling engines may be trapped in the cutting.</p> <p>Air quality modelling must extend beyond receptors on the M25 and London Road. Must also consider effects on users of the new access road if stuck in queuing traffic.</p>	Agreed.
Kent County Council	Local authorities will need to agree sensitive receptors to be modelled in the area to determine the impacts during construction and operational phases. Real opportunity for proposal to include innovative measures; this development could be low emission or emission neutral.	Noted this will be addressed in the DCO submission.
Highways England	Main concern is the effect on traffic flows on the strategic road network expected to be 15 million visitors per year. The air quality modelling will be based on traffic data that takes into account the remaining Lower Thames Crossing Options (A and C) and "no crossing" option over the five following modelled years: 2014 (baseline), 2017 (construction), 2020 (opening), 2025 (fully operational) and 2035. All of these options will need to be modelled for air quality with a corresponding Do-Minimum scenario that includes committed developments for comparison. All of the scenarios listed above should be assessed for the air quality impact on the SRN.	Noted.
Swanscombe and Greenhithe Town Council	Concern over air quality impacts.	Noted.
High Speed 1	Construction activity alongside HS1 will need to be tightly controlled, control of windblown debris, control of dust emanating from sites towards the railway	Noted.

BASELINE CONDITIONS AND MAIN ISSUES

15.13. Thurrock, Gravesham and Dartford have all declared air quality management areas (AQMA) close to the Project Site. The nearest AQMA are:

- London Road Grays, Orsett Road and Stanley Road (Thurrock Council).
- London Road South Stifford (Thurrock Council)
- IBIS Hotel (Thurrock Council)
- London Road West Thurrock (Thurrock Council)
- Tilbury Dock Road, Calcutta Road (Thurrock Council)
- Gravesham A226 One-way system AQMA (Gravesham Borough Council)
- Northfleet Industrial Area (Gravesham Borough Council).
- London Road (Dartford Borough Council).

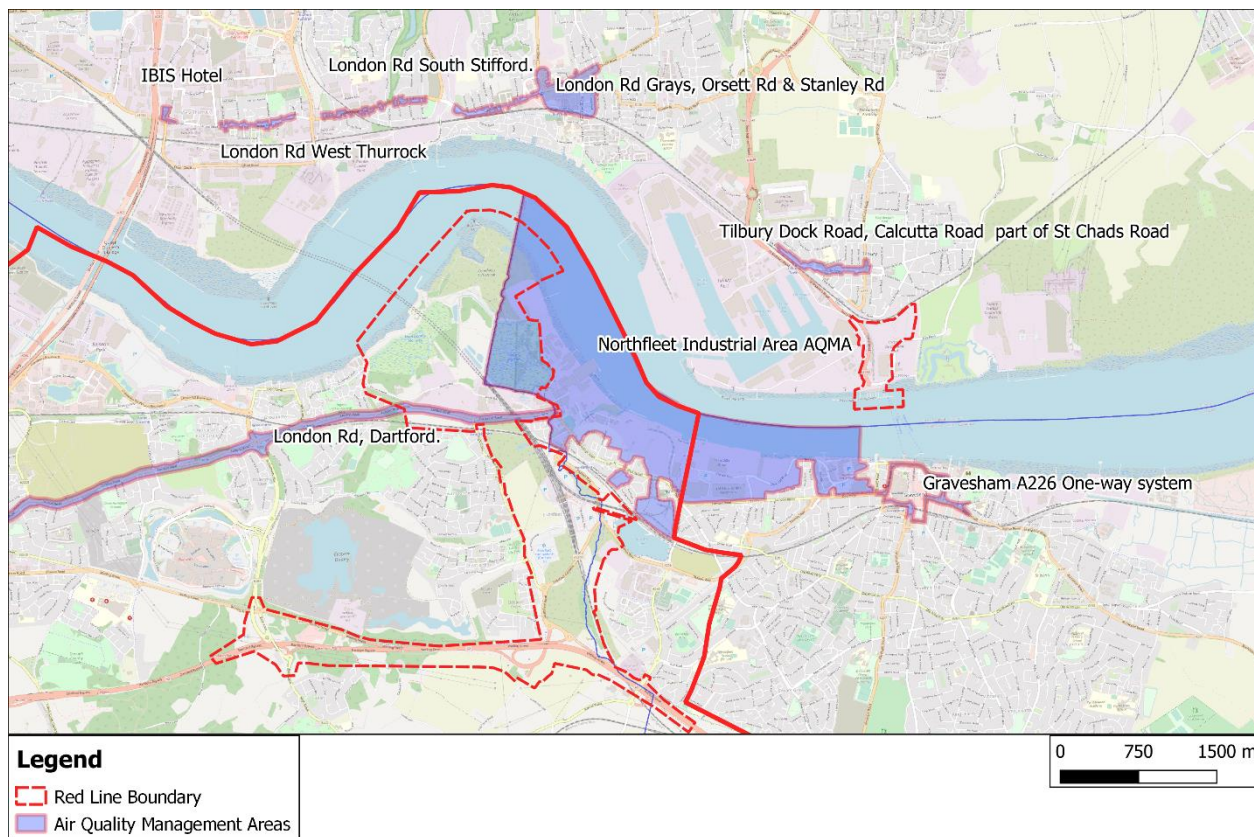
15.14. The Northfleet Industrial Area AQMA has been declared as a result of exceedances to the long term PM₁₀ air quality objective, whereas the other AQMA have been declared due to exceedances to the annual mean NO₂ air quality objective.

15.15. Baseline air quality information will be derived from the following sources:

- Air Quality Annual Status Reports from Thurrock, Dartford and Gravesham councils.
- Defra's national air quality background maps.
- Baseline traffic data supplied from the appointed traffic consultant.

15.16. Due to the close proximity of the AQMA there is extensive air quality monitoring in the areas surrounding the Project Site which will be used to establish baseline background and roadside air quality conditions.

Figure 15.1: Nearby Air Quality Management Areas



PRELIMINARY ASSESSMENT OF POTENTIAL EFFECTS

15.17. Potential significant effects arising from the construction and operation of the Proposed Development that will be addressed in the assessment are as follows.

- Effects from dust and PM₁₀ emissions generated during the construction phase, including from earthworks, demolition and the movement of dust and dirt due to by construction vehicles.
- Effects of emissions from construction and operational phase of the development on nearby ecological receptors.
- Effects of emissions from construction traffic, in particular heavy-duty vehicles associated with construction works.
- Effects of emissions from road traffic generated as a result of the operation of the Proposed Development.
- Effects associated with emissions from the proposed back-up combustion plant.

- Effects associated with existing and future sources of emissions on future receptors that would be introduced to the area through the development scheme.
- The potential for cumulative effects to take place as a result of the Proposed Development and other cumulative developments, during construction and operation.

- 15.18. Nearby monitoring results and the presence of a number of AQMAs indicate the Project Site is located in an area of relatively poor air quality. This is principally a result of the close proximity to major roads (M25 and the A2(T)) and the industrial use of surrounding land.
- 15.19. Areas of poor air quality are the most sensitive to changes in pollutant concentrations, so even minor changes as result of a Proposed Development may lead to significant impacts. Receptors within the nearby air quality management areas will be most likely to be affected by operational emissions.
- 15.20. Existing receptors located along the main access roads to the Project Site, and along roads that will see significant increases in traffic flows, will have the potential to be significantly impacted by transport emissions.
- 15.21. On-site receptors, and existing receptors in relevant proximity to the Project Site, will have the potential to be impacted as a result of any combustion processes, or building emissions, associated with the Proposed Development.

APPROACH AND METHODOLOGY

Construction phase

- 15.22. Construction activities will give rise to dust and PM₁₀ emissions with the potential to affect local air quality. Impacts during the construction phase of development will be assessed using the Institute of Air Quality Management's (IAQM) guidance on the assessment of dust from demolition and construction. This guidance provides a qualitative methodology for assessing the potential air quality impacts from various site construction activities (earthworks, demolition, construction and trackout) and provides site-specific mitigation measures to minimise these potential impacts. Construction impacts can occur up to 350m² from the Project Site boundary, and therefore receptors within this distance will be considered in the assessment.
- 15.23. Traffic generated during construction will give rise to nitrogen oxides (NO_x) and PM₁₀

² IAQM Best Practice guidance states; "an assessment will normally be required where this is a human receptor within 350m to the site boundary" and the process of reviewing local sensitivity requires "estimating the total (receptors) within the stated distance, e.g the total within 350m". IAQM, 2014. *Guidance on the assessment of dust and demolition and construction.* [URL](#)

emissions which will also have the potential to affect local air quality. Traffic emissions from the construction phase of development will be assessed quantitatively using the dispersion modelling software *ADMS-Roads*³.

Operational phase

- 15.24. Traffic generated during the operation of the Resort will give rise to nitrogen oxides (NO_x) and particulate matter (PM₁₀ and PM_{2.5}) emissions which will have the potential to affect local air quality. Any on-site combustion processes could also give rise to emissions with the potential to affect local air quality. Operational impacts will be assessed holistically, considering both traffic-related emissions and emissions from the back-up boilers. The air dispersion model *ADMS-Roads* will be used to predict the impacts of emissions on pollutant concentrations at nearby receptors as a result of the Proposed Development.
- 15.25. Concentrations of NO₂ and PM₁₀ will be predicted at sensitive receptors, whilst nitrogen deposition and NO_x concentrations will be considered at designated nature conservation sites.
- 15.26. Concentrations of pollutants will be forecast at nearby receptors for the following scenarios. It might also be necessary to assess an intermediate year opening, for example once Gate 1 has opened and prior to full build out, subject to agreement with the relevant local authorities:
- *Baseline*: 2019 or latest year with published and finalised air quality monitoring data;
 - *do nothing*: future opening year baseline *without development* (year of development opening);
 - *do something*: future opening year *with development* (year of development opening).
- 15.27. To ensure worst case results are captured by the assessment, receptors will be assessed at worst case locations (e.g. for example at breathing height at receptor facades); and traffic data and emissions data will reflect worst case scenarios.
- 15.28. A comparison of results in future 'do nothing' and 'do something' scenarios will allow the effect of the Proposed Development to be determined.
- 15.29. Assessment will also consider the introduction of new receptors into an existing area of poor air quality.

³ ADMS-Roads is a new generation dispersion modelling system produced by Cambridge Environmental Research Consultants which can be used to assess the impact of road vehicles on local air quality. It can include parameters such as variable meteorological conditions, complex road networks (including the combined contribution of multiple road links on single sensitive receptors) and the capability of including the effects of complex terrain, atmospheric chemistry and street-canyon effects. The model is widely used by Local Authorities in the UK as part of their review and assessment of planning obligations.

15.30. The most recent meteorological data will be used for the dispersion modelling, whilst the use of appropriate background concentrations will be agreed with the local authorities' air quality officers.

15.31. Cumulative effects will be assessed, with traffic data accounting for committed developments. Other Proposed Developments/activities that might have a cumulative effect upon local air quality will be considered and agreed following consultation with local authority.

Assessment significance criteria

15.32. Results will be considered in relation to relevant National Air Quality Objectives. Effect significance will be determined in accordance with the IAQM's significance criteria (IAQM, 2014).

15.33. Predicted nitrogen deposition will be compared with critical loads as defined by the Air Pollution Information System (APIS)⁴, and significance will be assessed in line with Environment Agency guidance on Habitats Regulations.

PROPOSED AVOIDANCE AND MITIGATION MEASURES

Construction phase

15.34. Mitigation measures for the construction phase will comprise site-wide measures to limit the generation of dust and assist dust suppression. These mitigation measures are best practice measures suggested by the IAQM, informed by the expected magnitude of emission release and proximity of nearby receptors. These measures will focus on the following key areas:

- Communications;
- site management;
- monitoring;
- site preparation and maintenance;
- vehicle and machinery operation and sustainable travel;
- operational considerations;

⁴ Air pollution information system (APIS) provides a searchable database and information on pollutants and their impacts on habitats and species. APIS is the recommended resource in the IAQM guidance on assessment of air quality impacts on designated nature conservation sites. [URL](#)

- waste management.

15.35. Proposed mitigation will be a combination of both hard measures (e.g. covering and seeding site stockpiles and installing water dust suppression systems) and soft and administrative measures (e.g. ensuring complaint logs are kept and made available to the local authority).

Operational phase

15.36. The two predominant sources of operational emissions will be from road traffic and any proposed combustion plant. Both these emission sources will lead to a deterioration in air quality and potentially significant impacts. Separate mitigation measures will be required to address these issues for both proposed on-site and existing receptors.

15.37. On-site designed-in mitigation measures might include:

- the use of mechanical ventilation in areas of poor air quality on site;
- emission abatement technology for proposed combustion plant;
- specified ultra-low emission standards for vehicles associated with the development on site;
- location of combustion plant stacks/flues to minimise impacts on receptors;

15.38. Other mitigation measures might include:

- encouraging the use of sustainable transport;
- park and ride schemes;
- an effective and sustainable travel plan to minimise impact of transport emissions.

UNCERTAINTIES

Operational phase

15.39. There are a number of components that contribute to the uncertainty of modelling predictions. The road traffic emissions dispersion model used is dependent upon the traffic data that have been input, which will have inherent uncertainties associated with them. There are then additional uncertainties, as models are required to simplify real-world conditions into a series of algorithms.

- 15.40. An important stage in the process is model verification, which involves comparing the model output with measured concentrations. This can only be done for the road traffic model. Because the model has been verified and adjusted, there can be reasonable confidence in the prediction of base year (2019) concentrations.
- 15.41. Predicting pollutant concentrations in a future year will always be subject to greater uncertainty. For obvious reasons, the model cannot be verified in the future, and it is necessary to rely on a series of projections provided by Department of Transport and Defra as to what will happen to traffic volumes, background pollutant concentrations and vehicle emissions.
- 15.42. Any combustion plant/point source modelling carried out in the assessment will be dependent upon emission rates, flow rates, exhaust temperatures and other parameters for each source, all of which in reality are variable as the plant will operate at different loads at different times.
- 15.43. There are then additional uncertainties, as models are required to simplify real-world conditions into a series of algorithms. These uncertainties cannot be easily quantified, and it is not possible to verify the point-source model outputs, however the assessment will take a worst-case approach were necessary in order to ensure a reasonable degree of confidence in modelled results.

Construction phase

- 15.44. Should dispersion modelling be required to assess the impact of construction traffic in the peak construction year, the same uncertainties outlined in para 16.40, 16.42 and 16.44 will be inherent in the assessment.

MATTERS TO BE SCOPED OUT

- 15.45. There have been no topics scoped out with respect to the air quality assessment.

REFERENCES

- 15.46. In order of appearance in the document:

Ministry of Housing, Communities and Local Government, *National Planning Policy Framework* (2019)

European Parliament (2008), *Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe*

Defra (2007), *The Air Quality Strategy for England, Scotland, Wales and Northern Ireland*

UK Government, *Part IV of the Environment Act (1995)*

Department of Environment and Rural Affairs (2018) Local Air Quality Management Technical Guidance (TG16)

Institute of Air Quality Management (2017) Land Use Planning and Development Control: Planning for Air Quality

Institute of Air Quality Management (2014), *Guidance on the assessment of dust from demolition and construction*

Institute of Air Quality Management (2019) *A guide to the assessment of air quality impacts on designated conservation sites. Institute of Air Quality Management.*

Sixteen ◆ Water resources and flood risk

INTRODUCTION

16.1 This chapter summarises the proposed scope of works for the development of the water resources and flood risk chapter of the EIA for the Proposed Development. This chapter will describe the impact of the development against the following headings:

- flood risk;
- stormwater management;
- water supply and distribution;
- wastewater treatment and foul drainage;
- marine infrastructure;
- water quality.

16.2 The assessments for each water aspect will be made with reference to the Project Site which is split into two areas:

16.3 The relevant assessments required for the Project Site as set out in the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 will be undertaken in parallel to the design to ensure that the proposed avoidance and mitigation measures for each of the water aspects listed above also meet the requirements of the Water Framework Directive (WFD). The WFD assessment will be provided as an addendum to the ES chapter.

RELEVANT LAW, POLICY AND BEST PRACTICE GUIDANCE

16.4 The following relevant law, policy and best practice guidance will be considered by the assessment for each water related aspect listed above:

Legislation

16.5 The main legal framework for the assessment is provided by the following Acts of Parliament and Regulations:

- The Flood and Water Management Act 2010.

- The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017.
- Marine and Coastal Access Act 2009.
- Flood Risk Regulations 2009
- Water Act 2003
- Water Resources Act 1991
- Environment Act 1995
- Water Act 2014 amending the Water Industry Act 1991
- Water Industry Act 1991
- Land Drainage Act 1991
- Flood and Water Management Act 2010
- Groundwater Regulations 2009
- Contaminated Land (England) Regulations (Amendment) 2012

National Policy

16.6 National Policy Statements (NPS) set out the need for and government's policies to deliver Nationally Significant Infrastructure Projects (NSIPs) in England. Chapter three of this scoping report explains that there is no NPS for business and commercial NSIP projects. However, to the extent that the Proposed Development includes transport and highways infrastructure regards will be had to relevant policy in the NPS for National Networks (NPS NN), including:

- Environmental and Social Impacts (NPS NN paragraphs 3.2 to 3.5).
- Climate Change Adaptation (NPS NN paragraphs 4.36 to 4.47).
- Pollution Control and other Environmental Protection Regimes (NPS NN paragraphs 4.48 to 4.56).
- Flood Risk (NPS NN paragraphs 5.90 to 5.115).
- Water Quality and Resources (NPS NN paragraphs 5.219 to 5.231).

16.7 To the extent that the Proposed Development includes marine works related to the port, regard will be had to relevant policy in the NPS for Ports (NPSP):

- Pollution Control and other Environmental Regimes (NPSP paragraphs 4.11.1 to 4.11.18).
- Climate Change Mitigation (NPSP paragraphs 4.12.1 to 4.12.10).
- Climate Change Adaptation (NPSP paragraphs 4.13.1 to 4.13.15).
- Flood Risk (NPSP paragraphs 5.2.1 to 5.2.28).
- Water Quality and Resources (NPSP paragraphs 5.6.1 to 5.6.12).

16.8 The Government's current planning policies on land use planning in England are set out in the National Planning Policy Framework (NPPF) (MHCLG, 2019). The following NPPF policies are relevant to consideration of water resource and flood risk matters:

- Section 14 - Meeting the challenge of climate change, flooding and coastal change.
- Section 15 – Protecting the natural environment and the control of water pollution.

Guidance

16.9 Planning Practice Guidance supports the NPPF by explaining key issues in implementing policy. The following sections of PPG are relevant to consideration of water resources and flood risk matters:

- Flood risk and coastal change, 2014.
- Water supply, wastewater and water quality, 2019.
- Natural environment, 2019.

16.10 The following guidance documents are applicable to the Proposed Development:

- MHCLG: Flood risk and coastal change, 2014.
- EA: Flood risk assessments: climate change allowances, 2020.
- Defra, JNCC, NE: Marine Conservation Zones: Swanscombe, 2019.
- Defra: Water Framework Directive implementation in England and Wales: new and updated standards to protect the water environment, 2014.

- EA: Water Framework Directive assessment: estuarine and coastal waters, 2017.
- MMO: Marine Licensing: impact assessment, 2018.

Local policies and plans

16.11 The following local planning policy documents are applicable to the Proposed Development:

- Thames Estuary 2100 Plan (TE2100), 2019.
- Thames River Basin District River Basin Management Plan, 2018.
- North Kent Rivers Catchment Flood Management Plan, 2009.
- Kent Thameside Delivery Board Strategic Flood Risk Assessment of Kent Thameside, 2005.
- Kent Thameside Regeneration Partnership Kent Thameside Water Cycle Study Phase 1 (and App J Updating the SFRA), 2009.
- Kent County Council Preliminary Flood Risk Assessment, 2011.
- Kent County Council Local Flood Risk Management Strategy 2017-2023.
- Kent County Council Drainage and Planning Policy Statement, 2017
- Kent County Council Land Drainage Policy, 2019.
- Kent County Council Thameside Stage 1 Surface Water Management Plan, 2013.
- Dartford surface water management plan, 2016.
- Ebbsfleet Wide Water Management Strategy, 2005.
- Ebbsfleet Garden City Development Report, Baseline, Department for Communities and Local Government, 2015.
- Ebbsfleet Implementation Framework, Ebbsfleet Development Corporation, 2017.
- Essex County Council Local Flood Risk Management Strategy, 2018.
- Thurrock County Council Preliminary Flood Risk Assessment, 2017.

- Thurrock County Council Flood Risk Management, 2015.
- Thurrock Strategic Flood Risk Assessment, Level 1, 2009.
- Thurrock Strategic Flood Risk Assessment, Level 2, 2010.
- Thurrock Water Cycle Study, Outline Study, 2010.
- Thurrock County Council Core Strategy and Policies for Management of Development (as amended), adopted 2015.
- Thurrock County Council Design Strategy SPD (Supplementary Planning Document), 2017.
- Port of London: Thames Byelaws, 2012.
- Port of London: General Directions for Navigation in the Port of London, 2016

Guidance documents

16.12 The assessment will also consider the following relevant guidance documents when deriving design strategies for avoidance or mitigation:

- CIRIA SuDS Manual C753, 2015.
- Water, People, Places: A guide for master planning sustainable drainage into developments, Lead Local Authorities of the South East of England, 2013.
- Sewers for Adoption, 8th Edition, Water UK/WRc plc., 2018.
- Highways Design Manual for Roads and Bridges - Highway drainage codes.
- Port of London Authority (PLA) Thames Byelaws 2012 - Associated Guidance.
- PLA Guidance to Berth Operators on The Thames, 2012.

THE 2014 SCOPING OPINION

16.13 The scoping opinion from the Planning Inspectorate for the 2014 submission was largely in agreement to the scope outlined in the report. However, there were comments which have been addressed as outlined in the table below.

Table 16.1: 2014 scoping opinion comment and response.

Paragraph Number in the 2014 Scoping Opinion Report	Summary of scoping opinion comment	Response
3.31	The Flood Risk Assessment which should be appended to the ES should include stakeholder consultation with EA, Thames Water, LPA, Southern Water, and HS1. The FRA should cover tidal flood risk as well as fluvial impacts including breaching and overtopping. Impact on local water courses should include the Ebbsfleet Stream and existing water management strategies.	Since the 2014 submission consultation has been undertaken with various stakeholders indicated. See Section 16.11 to 16.18 for further details. Breach modelling has been undertaken and will be updated to include latest sea level rise scenarios. Impact on existing water courses will be considered.
3.32	The impacts of raising flood defences, compensatory water storage and raising of ground levels should be fully considered with appropriate reference to other topics. The intention to include sustainable drainage systems including rainwater recycling, green roofs, swales and other open features is welcomed. The EIA will need to fully assess the impacts and opportunities for environmental enhancement associated with these elements.	Noted and reflected in this scoping report.
3.33	Potential impacts on the public sewer network should be addressed, including easements and vibration during construction works. Comments from DBC and GBC should be considered when assessing existing drainage arrangement and other infrastructure in the area.	Noted and reflected in this scoping report.
3.34	This chapter should be cross-referenced with the Soil and Ground Conditions topic as groundwater is a potential pathway for discharge of pollutants to surface and coastal waters. Ecological surveys may inform baseline and potential monitoring of water quality. Buried	Noted and reflected in this scoping report. Groundwater is also addressed in the soils and hydrogeology chapter of the scoping report.

Paragraph Number in the 2014 Scoping Opinion Report	Summary of scoping opinion comment	Response
	cultural heritage assets should be considered as receptors for potential impacts on water quality. Impact of dredging on marine water quality and disposal of material should also be addressed.	
3.35	It should be made clear how the Water Framework Directive will be taken into account in the assessment.	Noted and reflected in this scoping report.
3.36	Mitigation measures should be addressed, and reference made to other regimes such as pollution prevention. Ongoing monitoring should be addressed and agreed with relevant authorities to ensure that any mitigation measures are effective.	Noted and reflected in this scoping report.

CONSULTATION FEEDBACK

- 16.14 Consultation feedback has been received from Statutory Consultees in response to information presented in the 2014 ES Scoping Report and the Preliminary Environment Information Report produced in relation to the London Paramount Project in April 2015.
- 16.15 Correspondence and meetings have been held over the period December 2014 to August 2017.
- 16.16 It should be noted that consultation undertaken during this period was in relation to the Kent Project Site only.
- 16.17 An initial telephone meeting was also held with the Environment Agency (Sustainable Places) on 27 March 2020 to reintroduce the project and agree a process for future liaison with the various Environment Agency teams, including Flood Risk.
- 16.18 Meetings were held with the Environment Agency to gain further clarity and agreement on the various water aspects required for the assessment. Agreements have been made on the level of detail and scenarios required for assessments; identifying key receptors that require impacts to be assessed; ensuring that current and future impacts are taken into account; types of potential mitigation options and opportunities onsite and offsite and that suitable monitoring may need to be considered to ensure effectiveness of mitigation measures in the future.
- 16.19 Meetings with the MMO have included acceptance of licences to be included within DCO

application provided that appropriate details are provided for activities such as dredging, habitat creation, outfalls and flood defence works.

- 16.20 Meetings held with the PLA have indicated support in principle for maximising the use of the River Thames. Operational access to existing infrastructure in the north of the Kent Project Site is required 24/7 during construction and operation phases. Agreement that all infrastructure works in the river should be on a PLA River Works licence. Agreement on design requirements were made and a request for protective provisions for the PLA to be considered. Consideration on extent of red line boundary needs to be made.
- 16.21 Meetings with Thames Water have included agreement of method of water supply to the site and the related uncertainties regarding timings and investment required.
- 16.22 Initial discussions with HS1 include understanding HS1 lease area and maintenance access rights within the DCO area; pumping of surface water from tunnel to main ditch in site and the monitoring facilities they have for this to reduce flood risk in the tunnel. These items need to be considered as part of the overall design.
- 16.23 The discussions and agreements with the stakeholders have been reflected in the approach and methodologies set out in this chapter.
- 16.24 Although consultation with the stakeholders listed above will be ongoing as part of this process, it is the intention that consultation will also be undertaken on water aspects with the local authorities, Southern Water and English Heritage.

BASELINE CONDITIONS AND MAIN ISSUES

- 16.25 The following section outlines the methodologies to be detailed in the ES that establish the baseline condition for each water aspect. The assessment will be undertaken in relation to the following identified water resources:
- Swanscombe peninsula drainage ditches and ponds (including Botany and Black Duck marshes).
 - Swanscombe peninsula groundwater table (refer to Chapter 18 Soils, hydrogeology and ground conditions).
 - North Kent groundwater aquifers.
 - River Ebbsfleet.
 - River Thames.
- 16.26 The baseline assessment for each water aspect will be made with reference to the site split into three key areas:

- Swanscombe peninsula (the Kent Project Site)
- Access road (the Kent Project Site)
- Tilbury site (the Essex Project Site)

Flood risk

- 16.27 An assessment will be undertaken to determine the existing flood mechanism and flood risk for the Project Site.
- 16.28 A Flood Risk Assessment will be appended to the ES report identifying flood risk from fluvial, tidal, surface water, sewer, artificial and groundwater sources. The assessment will consider the frequency and impact of flooding from these different sources.
- 16.29 Existing flood risk and historic events occurring at the Project Site will be determined based on a desktop study of available reports, including the Environment Agency's flood mapping and Kent County Council and Thurrock Council's Strategic Flood Risk Assessments.
- 16.30 The latest available hydraulic flood model for the River Thames at these locations will be obtained. This will allow a more detailed assessment in obtaining flood levels and therefore flood risk to different parts of the Project Site.
- 16.31 The latest available hydraulic flood model for the River Ebbsfleet will be obtained. This will allow a more detailed assessment in obtaining flood levels and therefore flood risk to the access road.
- 16.32 Information on de-watering schemes in surrounding sites will be obtained to better understand the potential impact of groundwater flooding.
- 16.33 Review of available information regarding existing key hydraulic structures, including hard and soft engineered structures will be undertaken to ascertain condition and function and whether changes are required to them which may have an impact on existing conditions.
- 16.34 The main issues regarding flood risk are currently identified as follows:
- Impact on development from tidal sources.
 - Impact of dewatering schemes in surrounding areas increasing groundwater levels.
 - Ensuring overland runoff not increased to offsite areas due to new development.

Stormwater management

- 16.35 An assessment of the existing surface water drainage arrangement will be carried out.
- 16.36 Thames Water and Southern Water utility sewer plans will be referred to in order to assess potential connection points and distribution links.
- 16.37 Topographic data will be used to define overland runoff catchments.
- 16.38 The Lead Local Flood Authorities will be consulted to understand Project Site specific requirements and that the strategy aligns with the wider strategic objectives.
- 16.39 Site visits will be undertaken to depict existing ditches and pipe connections if possible, to ascertain sources of flow to Botany and Black Duck marsh.
- 16.40 Review of existing discharge or abstraction licences to the Project Site will be obtained to understand the discharge points and volumes. This will include discharge points for HS1 and Eastern Quarry.
- 16.41 The relevant water utility companies and local planning authority highway agency will be consulted to determine ownership of road drainage and obtain drainage network plans along the access corridor. This will identify any drainage constraints/restrictions, drainage catchment areas and connection points.
- 16.42 The main issues regarding drainage are currently identified as follows:
- Surface water requirements for local fauna and flora sites.
 - Capacity and sizing of network to accommodate tide lock scenario.
 - Re-routing of the Eastern Quarry dewatering.
 - Water quality.
 - Impact on HS1 tunnel and station.

Water supply and distribution

- 16.43 An assessment of the existing potable water source and demand will be determined for the Project Site.
- 16.44 Thames Water and Southern Water utility potable (clean water) plans will be referred to for the Kent Project Site and Anglian Water for the Essex Project Site, in order to assess potential connection points and distribution links.

- 16.45 Review of existing groundwater discharge or abstraction licences around the Project Site will be obtained to understand the mechanism for existing groundwater levels and constraints.
- 16.46 Outcomes of consultations with the utility providers will be presented outlining the available capacity in the existing network and any foreseeable constraints.
- 16.47 A review of existing water resource management plans for the Project Site and surrounding areas will be undertaken in order to understand planned strategies and to ensure the development does not have an impact on other areas, whilst identifying opportunities.
- 16.48 The main issues regarding water resources are currently identified as follows:
- North Kent is considered water stressed. Existing infrastructure in the area is likely to meet demand only up to 2035. Therefore, impact of water demand at the Kent Project Site and surrounding areas needs to be considered for the design life of the development.
 - Thurrock is also considered an area of serious stress according to the EA as reported in the Thurrock Water Cycle Study and water efficient measures would need to be incorporated.
 - Developing a strategy that ensures future resilience to water supply will be required.

Wastewater treatment and foul drainage

- 16.49 An assessment of the existing foul drainage network and wastewater requirements will be determined for the Project Site.
- 16.50 Thames Water, Southern Water and Anglian Water utility sewer plans will be referred to in order to assess potential connection points and distribution links.
- 16.51 Outcomes of consultations with the utility providers will be presented outlining the available capacity in the existing network and wastewater treatment facilities and any foreseeable constraints.
- 16.52 A review of existing water resource management plans for the Project Site and surrounding areas will be undertaken in order to understand planned strategies and to ensure the development does not have an impact on other areas whilst, identifying opportunities.
- 16.53 The main issues regarding wastewater and foul drainage are currently identified as follows:

- The existing sewage treatment works in the area are unlikely to support the increased foul discharge from the development at the Kent Project Site without upgrade.

Marine Infrastructure

16.54 An assessment will be undertaken of the existing infrastructure in the marine environment, with particular reference to the existing jetty and wharf.

16.55 Available information detailing the drainage outfalls and flood defences will be reviewed to assess capacity and condition and will be covered in the Flood risk and Stormwater management sub-chapters.

16.56 A condition survey of the jetty will provide information of the suitability for re-use of the structure and the works required for refurbishment and environmental impact of such works.

16.57 Review of existing navigation uses within the area will also be considered. More detail on navigation will be provided in the Transport chapter (Chapter 9).

16.58 The main issues regarding the marine infrastructure are currently identified as follows:

- Water quality.
- Dredging impacts.
- Increased pollution from increased boat use during construction and operation phase.

Water quality and the Water Framework Directive

16.59 An assessment of the existing water quality that meets the Water Framework Directive criteria will be carried out for the Project Site.

16.60 The assessment will be based on the water resources listed at the beginning of this chapter and any others identified during the EIA process.

16.61 Water designated sites will also include groundwater Source Protection Zones and Nitrate Vulnerable Zones.

16.62 The existing classification status of the main water bodies as recorded by the Environment Agency will be used to form the WFD baseline assessment for the development.

16.63 The main issues regarding water quality and the WFD are currently identified as follows:

- Water quality status to water bodies in and close to the Project Site that are not

currently classified.

- Limited available monitoring data.

PRELIMINARY ASSESSMENT OF POTENTIAL EFFECTS

16.64 The primary effects and impacts will be detailed in the ES. These effects are identified as ones that could occur during different stages of the development life, including the construction and operation phases.

16.65 The effect significance will be based on assessing the effect magnitude (i.e. the deviation from the baseline condition) and the sensitivity of the likely receptor. Professional judgement and the use of a matrix approach will determine if potential effects are considered to be significant.

16.66 The resources/receptors outlined in Table 16.2 will be considered in the assessment. It is not anticipated that these resources/receptors will all be significantly affected but it is necessary to demonstrate that these important receptors have been considered. Incorporation of mitigation through design or management will address the majority of any potential health risks associated with the development itself. The main potential effects arising at the Project Site, prior to the incorporation of mitigation measures are also identified.

16.67 A site constraints map will be developed for the ES that depicts the risks and impacts from the different aspects.

Table 16.2: Receptors and potential effects

Receptor	Effect
Construction workers	Flood event during construction phase cutting off access routes, damaging equipment or direct hazard to the workers.
Future site users (residents, staff and visitors)	Residual effect of flood events greater than design standard of protection or failures in systems creating a hazard to users. Recreation water and drinking water being contaminated. Demand exceeds supply of drinking water, and water for uses in the building.
Surrounding land users (neighbours)	Reduction in available drinking water. Increased risk from flooding due to development.
Built environment	Damage to buildings due to sea level rise and rise in groundwater levels.
Groundwater	Impact from excavation during construction creating new pathways mobilising leachate. Contamination of water resources.
Surface water features (including Black Duck and Botany Marsh)	Reduction in water quality due to events such as mobilisation of contaminated soil or impact of a public sewer during

Receptor	Effect
	<p>construction phase; oil spills and hydrocarbons from vehicles; failure in a new wastewater treatment facility.</p> <p>Contamination of water resources.</p> <p>Changes by users with existing consented discharge licences having impact on habitats.</p> <p>Rise in groundwater levels due to water management of the Project Site impact marsh habitats.</p> <p>Increase in surface water runoff due to development altering habitat conditions.</p>
River Ebbsfleet	Hydrocarbons from road users or oil spills having impact on water quality and watercourse fauna and flora. Exceedance of surface water storage area and runoff from Project Site.
River Thames	<p>Dredging and disposal of material reducing water quality and impact to aquatic environment.</p> <p>Increased water users during construction and operation phases having an impact on water quality and disturbance to habitats.</p> <p>Potential loss of habitat for new/refurbished marine infrastructure.</p>
Buried archaeological remains	<p>Impact from excavation during construction.</p> <p>Effect of water quality or changes in groundwater level on organic remains, microfossils and other environmental indicators.</p>
Users with discharge consents	Changes in existing surface water regime impact the operation of existing users in surrounding area.

APPROACH AND METHODOLOGY

16.68 The cumulative and inter-related impact of the Proposed Development will be considered in relation to other chapters of the ES, including terrestrial ecology and biodiversity; aquatic ecology and biodiversity; human health; soils, hydrogeology and ground conditions; landscape and visual; cultural heritage and archaeology; land transport; and river transport.

16.69 They will also be considered in relation to other existing and proposed schemes in the surrounding areas to identify opportunities for overall enhancement such as through ecological enhancement within the Thames-side Green Corridors Biodiversity Opportunity Area. Likewise, any proposed schemes that have identified areas for other beneficial purposes such as flood mitigation in the access corridor will be taken into account to either utilise opportunity or to ensure no conflict.

16.70 The following methodology will be utilised to assess the Proposed Development against the baseline. A conceptual model of the Project Site that describes its environmental features together with the expected interaction of potential contamination sources with

the environment will be developed. This will be done by undertaking a *Source – Pathway – Receptor* analysis of the Project Site in accordance with the guidance documents referred to above. These terms as defined below:

- Sources: Potential or known sources of potential contamination or flood risk associated with historic or recent/ current land uses (e.g. disposal of wastes, spills and leaks).
- Pathways: Mechanisms/ systems thorough which exposure of a receptor to a contaminant or source of flooding could occur e.g. direct contact with contaminated soils, migration through air, over land or via permeable ground.
- Receptors: Receptors of varying sensitivity that could be adversely affected by contact (direct or indirect) with a contaminant e.g. people living, working or visiting the Project Site, groundwater and surface water bodies, ecological resources (flora and fauna).

16.71 The Flood Risk, Stormwater management, Water supply and distribution, Wastewater treatment and foul drainage and Marine infrastructure will become separate sub-sections in themselves but will support each other. The content for each topic is detailed below.

Flood risk

16.72 The Flood Risk Assessment (FRA) will be prepared in accordance with the NPPF, first published in March 2012, updated 2019. This states that:

‘Inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk, but where development is necessary, making it safe without increasing flood risk elsewhere’.

16.73 It is envisaged that the FRA will demonstrate that the principal objectives of the NPPF will be met, including users of the Project Site and emergency services have safe access and egress at all times.

16.74 If the River Thames hydraulic flood model has not been simulated using the latest EA sea level rise climate change guidance, the model will be updated, and flood levels used to inform the future flood risk at the Project Site.

16.75 Reference to the TE2100 Plan flood risk requirements will be made.

16.76 The following criteria outline the approach and methodology agreed with the Environment Agency for assessing the residual flood risk to the Proposed Development at the Kent Project Site and to surrounding areas:

- Undertake breach modelling in the proposed defences to identify residual flood hazard to users of the Project Site.

- Breach modelling to be undertaken for the 1 in 200 year + climate change tidal level.

16.77 A similar approach will need to be agreed with the EA for the Essex Project Site.

16.78 Hydraulic modelling of the River Ebbsfleet was not identified to be required. This will be undertaken if it is considered that mitigation measures are to be proposed along the river/within the river catchment basin.

16.79 Consideration of different mitigation measures will be evaluated with regard to their cumulative impact and may include measures such as raising flood defences, flood storage, raising development ground levels, or floor levels.

16.80 The ES will include design information that ensures that appropriate access to all flood defences and key infrastructure will be provided to allow maintenance, inspections and any renewal works to occur during their design life.

Stormwater management

16.81 The stormwater section will summarise the impact of the development compared to the baseline condition with regard to the following, which will be detailed in the FRA drainage strategy:

- Identifying any alterations in flow path routes.
- Ensuring existing surface water catchments receive same rates of runoff if considered beneficial for ecological or groundwater recharge reasons.
- Undertaking calculations to ensure that the rate of runoffs due to the development do not have an adverse effect on existing surrounding users.

16.82 The following criteria have been agreed with the EA to develop the surface water strategy to ensure flood risk to users on the Project Site and offsite are not at increased flood risk:

- the 1 in 2 year rainfall event is to be contained within the stormwater network pipes on the Project Site and not surcharge the network;
- the 1 in 30 year rainfall event is to be contained within the stormwater network allowing for surcharging of the network, but with no flooding on the surface;
- the 1 in 100 year rainfall event is designed to flood the surface of the Project Site but will have no impact off site.

16.83 Surface water storage for the Proposed Development will be designed to mitigate the Project Site from surface water flooding during periods of high tide, when the surface

water drainage network is not able to drain via gravity into the River Thames. Storage on the Kent Project Site will be provided for this tide lock scenario. The tide locked scenario will be designed for the combined probability of either:

- a 1 in 5 year (with allowance for climate change) rainfall event coinciding with the 1 in 200 year tidal event; or
- a 1 in 100 year (with allowance for climate change) rainfall event coinciding with the Mean High Water Spring tidal level.

- 16.84 A similar methodology will need to be agreed for the Essex Project Site.
- 16.85 The chosen design criteria will be based on an assessment of the combined probability and discussions with the EA.
- 16.86 Management of surface water flow rates will consider the flood risk implications outlined in the Flood Risk sub-chapter.
- 16.87 The proposed stormwater design will include pollution control measures to ensure water quality in receiving water bodies is not reduced, but ideally improved.
- 16.88 The drainage design will ensure that the existing licensed discharge or abstraction points and volumes can continue to operate as contracted.
- 16.89 The ES will also take into account any planned (currently unlicensed) discharges where data is available to understand the cumulative impact in the future.
- 16.90 Discussions with the relevant stakeholders will be made to ensure any proposed discharge rates and strategy along the access road can be accommodated and ownership and maintenance regimes agreed.
- 16.91 Discussions with Kent County Council and Essex County Council as Lead Local Flood Authorities will be made to ensure that the strategy meets their requirements.
- 16.92 To ensure there is no risk in contamination released into groundwater or surface water, design of new drainage networks will ensure that impacts on the existing public sewer network, including easements and vibration during the construction phase will be minimised.

Water supply and distribution

- 16.93 This section will describe the water strategy for the Proposed Development, the demands and the sustainable strategy for water supply.

16.94 An assessment will be undertaken for the Project Site to best estimate water demand using available benchmarks as agreed with the relevant water company using available data for the following:

- The construction phase.
- The different operation phases including:
 - building uses;
 - irrigation;
 - new water features within the development.

16.95 Review of existing licensed and unlicensed (if data available) abstractions and discharges to ensure works do not impact on existing operations.

16.96 Agreements made with Thames Water, Southern Water, Anglian Water and local authorities will be included in the assessment that ensures water supply to the Project Site can be met but not at the detriment to the local ecology or other development sites (existing or proposed).

16.97 Any mitigation measures proposed will ensure resilience to water resources for the design life of the Proposed Development.

Wastewater treatment and foul drainage

16.98 This section will describe the wastewater treatment and associated foul drainage strategy for the Proposed Development.

16.99 Calculations will be undertaken for the Project Site to best estimate the average and peak foul flows using available benchmarks as agreed with the sewer undertaker for the following:

- The construction phase.
- The different operation phases including:
 - building uses;
 - new water features within the development.

16.100 Discussions with the relevant utility providers will determine the appropriate option for the Project Site taking into consideration existing network constraints and future development proposals.

16.101 Options for reducing waste through measures such as greywater recycling, water reuse and having on-site treatment facilities will need to be explored.

Marine Infrastructure

16.102 Based on the baseline review, the options for refurbishment and or a new jetty will be made. It is currently proposed that a new jetty will be required. Consideration will need to be made for the construction phase and operation phase, as it is likely that construction materials will be transported to and from the Project Site via boat.

16.103 The assessment of the impact of a new jetty on the existing marine environment will require approximate location and volumes of dredging to be identified. This will be dependent on the type of jetty/wharf design and operational requirements taken forward.

16.104 Methods and mitigation requirements will need to be stipulated to inform construction methodologies (in the Construction Environmental Management Plan) to consider the relevant environmental constraints and protection measures with an aim to obtain the following:

- No deterioration in water quality.
- Existing benthic habitats are safeguarded.

16.105 The potential impact on the receptors identified will also be considered for the operation phase which will see an increase in the number of boat services in the area.

16.106 The ES will detail the relevant activities within the river as part of the construction and operation phase that would be licensable activities. These may include the following for which further details will be provided:

- dredging;
- disposal of dredged material;
- construction and maintenance of jetties and water taxi facilities;
- construction and maintenance of flood defences and outfalls;
- habitat creation (offset from any lost habitat).

Water quality and the Water Framework Directive

16.107 The EIA will be used to inform the following stages:

- *screening*: excludes any activities that do not need to go through the scoping or impact assessment stages;
- *scoping*: identifies the receptors that are potentially at risk from an activity and need impact assessment;
- *impact assessment*: considers the potential impacts of an activity, identifies ways to avoid or minimise impacts, and shows if the activity may cause deterioration or jeopardise the water body achieving good status

16.108 The different stages will be undertaken based on the approach set out by the EA WFD guidance.

16.109 The relevant assessment reports identified above will be appended to the ES chapter.

16.110 The overall aims and objectives of the WFD are to:

- enhance the status and prevent further deterioration of surface water bodies, groundwater bodies and their ecosystems;
- ensure progressive reduction of groundwater pollution;
- reduce pollution of water, especially by Priority Substances and Certain Other Pollutants;
- contribute to mitigating the effects of floods and droughts;
- achieve at least good surface water status for all surface water bodies and good chemical status in groundwater bodies by 2015 (or good ecological potential in the case of artificial or heavily modified water bodies); and
- promote sustainable water use.

16.111 As a result, new developments that have the potential to impact on current or predicted WFD status are required to assess their compliance against the WFD objectives of the potentially affected water bodies.

16.112 The WFD assessment will consider:

- all activities carried out;
- each stage of the activity, for example construction and operation;
- the water body the activity is in and all water bodies it could affect.

- 16.113 The ES will consider existing information and set up a methodology that ensures the following:
- the Proposed Development will not lead to deterioration in the quality of a water body;
 - the Proposed Development will not prevent the future improvement of a water body;
 - the Proposed Development will not impact a protected nature conservation area or priority habitat;
 - the Proposed Development will not impact a protected or priority species;
 - heritage, landscape and fisheries interests and the need for an EIA have been considered;
 - opportunities have been sought to improve the water environment.
- 16.114 The WFD will review the relevant water aspects listed above and assess the impacts of the works and mitigation measures with regard to water quality in this chapter.
- 16.115 The ES will outline the methodology for setting up a monitoring schedule that will allow testing of the relevant criteria before any works commence on the Project Site. This will allow a baseline survey to be conducted so that during construction and operation phases, a continued assessment of the relevant criteria can be made to ensure no reduction in status. If any deterioration is observed, appropriate mitigation options will need to be planned and implemented.
- 16.116 Assessment of impacts to human health exposure will be addressed in Chapter eight Human Health.
- 16.117 Likewise, the potential off-site effects of emissions to groundwater and surface water drinking supplies will be assessed for potential for population exposure.
- 16.118 The methodology for monitoring schedule will complement and be developed in-line with ones being set-up from an ecology perspective.
- 16.119 The chapter will review assessment and design proposals that have an impact on groundwater sources, with consideration to the Kent Project Site's existing use as a landfill site such as due to flooding or drainage. This will meet any groundwater Source Protection Zone drinking water supply requirements as well as water quality impacts on groundwater as a water body identified in the WFD assessment.
- 16.120 Any impacts associated with wastewater treatment facilities that discharge to locations other than the existing sewer network will be considered.

16.121 Table 16.3 summarises the assessment criteria for determining receptor sensitivity and impact significance that are being used in the assessment of water and flood risk issues. Table 16.4 sets out the criteria for determining impact magnitude, and Table 16.5 sets out the impact significance matrix.

Table 16.3: Criteria for determining receptor importance

Importance	Criteria
High	Water bodies that are important at a national and/or international scale, have Good Ecological Potential (or better) under the Water Framework Directive (WFD), or are protected under any EU directive or UK Wildlife legislation. They are of importance for social and economic uses (i.e. navigation and recreation).
Medium	Water bodies that are important at a regional scale and is classified as having Moderate Ecological Potential under the WFD and it is not protected under any EU Directive or UK wildlife legislation. Although its water quality is considered poor. It is important for some economic and social uses (i.e. navigation and recreation).
Low	Water bodies that are of little importance on a regional or local scale, have Moderate Ecological Potential (or worse) under the WFD, no protection under any EU directive or UK wildlife legislation, low importance for economic and social uses (i.e. navigation and recreation).
Negligible	Water bodies that are not important on a regional scale, have Moderate Ecological Potential (or worse) under the WFD, are not protected under any EU directive or UK wildlife legislation, and are of negligible importance for economic and social uses (i.e. navigation and recreation).

Table 16.4 Criteria for determining impact magnitude

Magnitude	Criteria
Large	Changes to site resulting in an increase in discharge/runoff with flood/sewerage exceedance potential. A large increase to flood risk of water bodies and areas downstream. A large risk of flooding to site infrastructure and users, as determined by the FRA in accordance with NPPF and the NPPF Technical Guidance notes.
Medium	Changes to site resulting in an increase in discharge/runoff within system capacity. A medium increase to flood risk of water bodies and areas downstream. A medium risk of flooding to site infrastructure and users, as determined by the FRA in accordance with NPPF and the NPPF Technical Guidance notes.

Magnitude	Criteria
Small	Changes to site resulting in slight increase in discharge/runoff well within drainage system capacity. A small increase to flood risk of water bodies and areas downstream. A small risk of flooding to site infrastructure and users, as determined by the FRA in accordance with NPPF and the NPPF Technical Guidance notes.
Negligible	Very minor to no change in discharge/runoff and increased pressure on sewer capacity. No increased flood risk to water bodies and areas downstream. No risk of flooding to site infrastructure and users, as determined by the FRA in accordance with NPPF and the NPPF Technical Guidance notes.

Table 16.5: Impact significant matrix

		Impact magnitude			
		Large	Medium	Small	Negligible
Receptor Importance	High	Major	Major	Moderate	Minor
	Medium	Major	Moderate	Minor	Minor
	Low	Moderate	Minor	Minor	Neutral
	Negligible	Minor	Minor	Neutral	Neutral

PROPOSED AVOIDANCE AND MITIGATION MEASURES

Flood risk

16.122 The following criteria outline the avoidance and mitigation measures agreed with the Environment Agency for the Kent Project Site, as outlined in the consultation section earlier in the chapter, for reducing the flood risk and hazard to users and in surrounding areas now and in the future:

- Flood defences to be raised to the 1 in 1000 year + climate change flood level up to end of the design life of the development + 600mm freeboard allowance.
- Design of flood defence should allow future raising.

16.123 Proposed avoidance measures will align with sequential approach set out in the NPPF.

16.124 Other possible mitigation measures to be considered by the Flood Risk Assessment include the following:

- Providing compensatory flood storage to offset that lost as a result of the Proposed

Development.

- Raising floor levels of buildings in areas of higher flood risk.
- Locating more vulnerable uses in areas of lower flood risk.
- Raise ground levels where required in the Project Site.
- Flood warning and evacuation management.
- Surface water drainage strategy.
- Providing means of safe access and egress during a flood event.

Stormwater management

16.125 The following criteria outline the avoidance and mitigation measures agreed with the Environment Agency for the Kent Project Site for managing stormwater runoff at the Project Site reducing the flood risk and hazard to users and in surrounding areas now and in the future.

- Discharge at unrestricted rate to the Thames.
- Incorporate non-return flap valves if new outfall.
- Allow appropriate storage in the surface water network to store rainfall volumes during a 1 in 5 year event during tide lock conditions.

16.126 Within the construction phase, consideration of methods of work that could lead to a deterioration in water quality, such as through mobilisation of contaminated sediment into ditches and marshes will need to be mitigated (method will be based on identifying existing flow routes and not through sediment transport modelling).

16.127 Water quality sampling taken during the construction phase will enable the appropriate mitigation measure to be assessed and implemented.

16.128 Easements will be considered during the construction phase to ensure that impact of construction work near existing public sewers is minimised and not impact human health exposure to contaminated water supplies.

16.129 To ensure leachate is not mobilised into the groundwater and exacerbated by the development, options using no infiltration methods will be considered where above ground drainage systems are used.

16.130 To manage rainfall runoff from the Project Sites for volume and quality purposes,

different sustainable drainage system options based on the Sustainable Drainage System (SuDS) hierarchy will be proposed such as green roofs (managing first flush runoff), swales, lined permeable paving, lined filter drains. The strategy will be developed incorporating the opportunity for other wider benefits such as enhancing biodiversity.

- 16.131 SuDS will also be considered for the access road drainage including means to reduce hydrocarbon pollutants entering the River Ebbsfleet.
- 16.132 Opportunities for compensation measures for overland runoff storage or habitat creation, will be sought in offsite areas such as improvement works to the river Ebbsfleet, if required.
- 16.133 Depending on the design surface water layout, discussions with relevant stakeholders would be required if any new outfalls are proposed. This will include the Environment Agency, the LLFAs, the MMO and the PLA to confirm the methodology needed to obtain the relevant approvals to ensure impact to the marine environment is minimised both during construction, operation and maintenance.
- 16.134 The design strategy for the Project Site would be to avoid any impact as a result of the Proposed Development on the existing marshes and ditches. However, where the Proposed Development needs to be sited in certain locations, mitigation measures will be put in place to reduce the impact. This may include habitat relocation, proposals such as this will be coordinated with the ecological assessment work.

Water supply and distribution

- 16.135 The approach for minimising impact on water resources will be based on the following:
- adoption of demand reduction (water efficiency) measures to minimise water demands, such as low flow taps and toilets, and;
 - identification and adoption as appropriate of non-potable water sources. This may include consideration of rainwater harvesting, grey and black water recycling. Uses of non-potable water may include irrigation, cooling and non-leisure water bodies.
- 16.136 Mitigation measures will be considered that ensure water use is both conserved and minimised during the construction and operation phase.
- 16.137 Investigation will be undertaken with Thames Water for re-commissioning two disused groundwater extraction boreholes located near the Project Site to extract water supply at the Kent Project Site. This would reduce the impact on existing groundwater supply boreholes. The dewatering in locality could provide benefit of anticipated rising groundwater levels due to schemes in neighbouring areas halting extraction operations. The option requires consideration on impact for associated water treatment plant and local distribution network.

16.138 The overall aim of the strategy will ensure that sustainable management of water will be made to ensure future resilience of the Project Site. The strategy will be considered in parallel with the energy strategy to aim for carbon and water reductions.

Wastewater treatment and foul drainage

16.139 Consultation with the relevant sewer undertakers will be included to develop the strategy in locating any new sewer treatment facilities and agreement with relevant landowners regarding discharge locations.

16.140 Water re-use and efficiency measures will be considered under the water supply sub-chapter and this will be undertaken with the aim to reduce demand and therefore waste requiring treatment.

Marine Infrastructure

16.141 It has been agreed with the MMO that marine licences for the activities can be applied for at the same time as the DCO application, provided that appropriate details are included to demonstrate minimal impact on the marine environment.

16.142 Mitigation measures will be developed to ensure disposal of any dredged material does not have an impact on water quality. The method of testing and disposal will be outlined in the ES. This will include information on dredging methods, contractors, vessels, dredge depth and disposal site). This information will also be used as part of the marine licence application.

Water quality and the Water Framework Directive

16.143 The EIA will investigate the various avoidance and mitigation measures proposed for each relevant water aspect. This will be used to inform the WFD assessment. Any further mitigation measures identified as part of the WFD assessment will be used to inform the relevant strategies and incorporated into the relevant ES sub-chapters.

16.144 The assessment will ensure that appropriate avoidance and mitigation measures are put in place for ecological and human health criteria.

UNCERTAINTIES

16.145 Tidal defence raising has been identified as a potential mitigation measure to reduce the hazard for users at the Kent Project Site. The function and effectiveness of the defences will be dependent on forming a continuous defence line that goes beyond the Kent Project Site's boundaries. This would rely on third party agreements from relevant landowners for raising defences. The requirements for the Essex Project Site are yet to be fully determined.

16.146 To fully understand the best water resource management strategy that ensures resilience in the future, relies on Thames Water/Southern Water/Anglian Water network capacity modelling. A timescale for this assessment may go beyond the programme for the DCO application. Therefore, different options may be put forward as part of the application, with further information and data required to confirm the best solution.

MATTERS TO BE SCOPED OUT

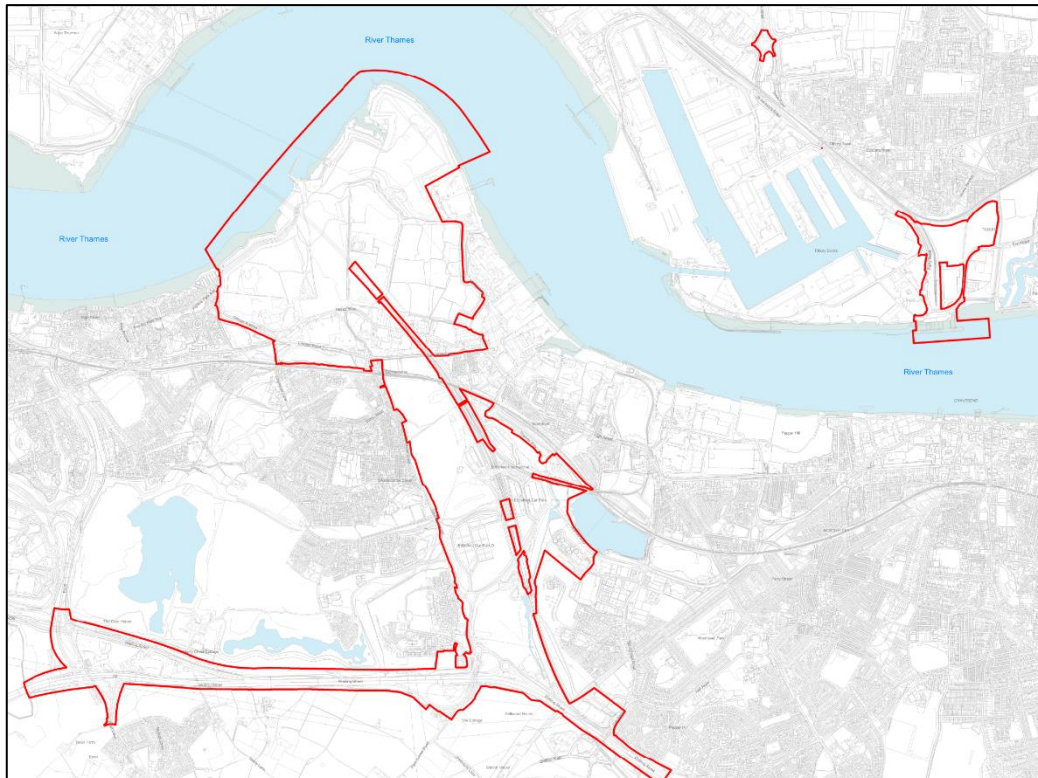
16.147 There have been no topics scoped out with respect to the water resource and flood risk assessment.

Seventeen ◆ Soils, hydrogeology and ground conditions

INTRODUCTION

- 17.1 The purpose of this section is to summarise the proposed scope of works for the development of the soils, hydrogeology and ground conditions chapter of the Environmental Impact Assessment (EIA) for the Proposed Development.
- 17.2 This Chapter will describe the impact of the Proposed Development in terms of the geoenvironmental conditions at the Project Site, with the aim of ensuring that suitable and safe conditions are achieved for the proposed end-use. Consideration will be given to the Project Site conceptual models including geology, hydrology, hydrogeology and the geoenvironmental conditions (including issues associated with soil gases, chemicals within soils and groundwater). A range of impacts associated with the design, construction and operation of the Proposed Development will be considered.
- 17.3 The areas that are subject to study with respect to the soil, hydrogeology and ground conditions is shown by the red hatched areas in Figure 17.1 below. The study will consider the development area as two separate sites; the Kent Project Site (south bank of the River Thames) and Essex Project Site (north bank).

Figure 17.1: Study area with respect to soil, hydrogeology and ground conditions (red hatched areas).



RELEVANT LAW, POLICY AND BEST PRACTICE GUIDANCE

Policy

17.4 National Policy Statements set out the need for and government's policies to deliver Nationally Significant Infrastructure Projects (NSIPs) in England. Chapter three of this scoping report explains that there is no NPS for business and commercial NSIP projects. However, to the extent that the Project includes transport and highways infrastructure, regard will be had to relevant policy in the NPS for National Networks (NPS NN), including:

- Environmental and social impacts (NPS NN paragraphs 3.2 to 3.5);
- Pollution control and other environmental protection regimes (NPS NN paragraphs 4.48 – 4.56).

17.5 In addition to this, the primary policy under which contaminated land is managed in the UK is National Planning Policy Framework 2019 (NPPF) [2].

17.6 Reference will also be made to regional and local policy and guidance relevant to the Kent and Essex Project sites.

17.7 For the Kent Project Site these are:

- Dartford Core Strategy, adopted 2011 [9];
- Dartford Development Policies Plan, adopted 2017 [10];
- Gravesham Local Plan Core Strategy, adopted 2014 [11];
- Gravesham Local Plan First Review – Saved Policies, 2014 [12]; and
- Kent Minerals and Waste Local Plan, 2019 [13].

17.8 For the Essex Project Site these are:

- Thurrock Local Development Framework, adopted 2015 [14]; and
- Schedule of saved Borough Local Plan policies, site allocations and annexes, 2012 [15]

Law

17.9 Land contamination is regulated under several regimes, including environmental protection, pollution prevention and control, waste management, planning and development control, and health and safety legislation. The primary laws under which

contaminated land is managed in the UK are:

- Part 2A of the Environmental Protection Act 1990 [1];
- The Contaminated Land (England) (Amendment) Regulations 2012 [10];
- The Waste (England and Wales) Regulations 2011 [11]; and
- The Environmental Permitting (England and Wales) Regulations 2010 [12].

Best practice guidance

17.10 The framework for the assessment of potential land contamination adopted in this assessment will be based on current guidance documents regarding the implementation of these regimes and the assessment of potentially contaminated land, with particular reference to:

- Environment Agency / DEFRA “Model Procedures for the management of land contamination (CLR11)” 2004 [3];
- Gov.uk “Land contamination: risk management” 2019 (currently in draft) [4];
- Environment Agency “Guidance principles for land contamination” 2010 [5]; and
- British Standard BS10175:2011+A2:2017 “Investigation of potentially contaminated sites” [6].

THE 2014 SCOPING OPINION

17.11 In 2014, the Planning Inspectorate provided a Scoping Opinion relevant to the proposed scope of works for the development of the soils and ground conditions chapter of the EIA for the Proposed Development, as detailed in the 2014 Scoping Report. These reports were relevant to an area of land on the Kent Project Site only.

17.12 The Scoping Opinion included comments relevant to soil and ground conditions, summarised in Table 17.1

Table 17.1: Summary of Planning Inspectorate comments included in Scoping Opinion report in 2014 relevant to soil and ground conditions.

Scoping Opinion section	Scoping Opinion Comment	Response
3.37	<i>The baseline of the ES should explain in detail and justify the extent of the study area applied, for both desk-based study described and any field-based</i>	Noted and will be implemented in ES chapter.

Scoping Opinion section	Scoping Opinion Comment	Response
	<i>investigations carried out.'</i>	
3.38	<i>'...considers that a considerable potential for sources of ground contamination exists...In this regard, the Secretary of State expects that the applicant should consult with relevant officers within local planning authorities and within the EA.'</i>	Noted. Consultation has and will be undertaken.
3.39	<i>'...cross reference should also be made to the section on water resources management in order to address potential impacts of the works to ground levels and the creation of suitable drainage features and other management measures.'</i>	Noted and will be implemented in ES chapter.
3.39	<i>'Inter-relationships with the transportation assessment should also be taken into account, including any trips generated from the need to remove contaminated or surplus spoil from the site.'</i>	Noted and will be implemented in ES chapter.
3.40	<i>'It should be demonstrated how the constraints with respect to this topic area have informed the project design.'</i>	Noted and will be implemented in ES chapter.
3.40	<i>'...notes the general potential mitigation measures listed in the Scoping advises that mitigation measures should be addressed and clearly related to the relevant impact pathways identified, and a full description of residual effects on receptors provided.'</i>	Noted and will be implemented in ES chapter.
3.41	<i>'Interrelationships between this topic area and others should be considered in the ES, in particular water management, cultural heritage, and ecology when assessing the potential impacts of the development including impacts from mitigation proposals.'</i>	Noted and will be implemented in ES chapter.

17.13 The Planning Inspectorate consulted on the Scoping Report with the consultees listed in Table 17.2 below. In general, consultees were in agreement with the proposed methodology and many of the comments related to standard practice in the assessment of potentially contaminated land. Comments relevant to this soils, hydrogeology and ground conditions chapter are summarised in Table 17.2.

Table 17.2: Summary of comments received from Planning Inspectorate Consultees.

Consultee	Comment	Response
Dartford Borough Council	<i>'The adopted local planning policy referred to is out of date and the London Plan is not</i>	Updated relevant local policy and

Consultee	Comment	Response
	<i>relevant to the site as it falls outside of the London area.'</i>	guidance documents will be referred to.
Dartford Borough Council	<i>'...would suggest the involvement of their contaminated land officer in the detailed proposed assessment.'</i>	Noted. Consultation will be undertaken.
Environment Agency	<i>'The site overlies a Chalk Aquifer...any pathways for contamination must be strictly controlled to avoid pollution of the principle and secondary aquifer from historic contamination.'</i>	Noted and understood. Appropriate mitigation will be identified (see 17.31)
Environment Agency	<i>'...the applicant should assess the risks to groundwater and surface waters from contamination which may be present and, where necessary, carry out appropriate remediation.'</i>	Noted and understood. Assessment will be carried out and remediation identified
Environment Agency	<i>'We recommend that the following reference is added: Environment Agency guidance on requirements for land contamination reports.'</i>	This document has been withdrawn. Relevant guidance is gov.uk "Land contamination: risk management" [4], listed in Section 17.9.
Gravesham Borough Council	<i>'...The report suggests a range of mitigation measures which if followed will mean that there should be no residual effects. However it is not clear from the scoping report what the implications are for the delivery of the necessary infrastructure and in particular the provision of the road access corridor being within the area of and adjacent to the filled ground, whether this is actually physically possible and what the residual effects will be.'</i>	Complexities are recognised. Intrusive investigation will be undertaken as required (see 17.19) and appropriate design and mitigation will be identified (see 17.31)
Gravesham Borough Council	<i>'It is very likely that long term maintenance will be required to deal with the volumes of leachate being produced by the landfill...consideration will need to be given as to whether the existing treatment system will be retained, or if a new system will be needed.'</i>	Complexities are recognised. Approach to leachate management not currently defined.
Gravesham Borough Council	<i>'The current system includes open storage lagoons, which will need to be adequately segregated from visitors.'</i>	Investigation will be undertaken as required (see 17.19) and appropriate

Consultee	Comment	Response
		design and mitigation identified (see 17.31).
Gravesham Borough Council	<i>'It is suggested...a phase 2 intrusive investigation will be undertaken in order to meet final planning requirements. The phase 2 investigation will need to be completed prior to the Development Consent Order being granted. This is to ensure that the contamination issues are fully understood and they are not to a degree that would warrant the site unviable for development.'</i>	Existing data will be supplemented by targeted investigation to resolve key uncertainties as required (see 17.19).
Marine Management Organisation	<i>'...would expect good environmental management practises to be implemented to prevent entry of contaminants into the marine environment via contaminated runoff.'</i>	Reflected in 17.31.
Marine Management Organisation	<i>'If dredging is to be undertaken, sampling of sediment by an MMO laboratory and in line with a sampling plan devised by Cefas will need to be undertaken in order to assess potential impacts upon water quality...'</i>	Noted. Will be undertaken as part of Phase 2 investigations as required.
Public Health England	<i>'The ES should clearly identify the development's location and the location and distance of the development of off-site human receptors...'</i>	Standard good practice. Will be adopted as part of assessment.
Public Health England	<i>'Consideration should also be given to environmental receptors, such as the surrounding land, watercourses, surface and groundwater, drinking water supplies...'</i>	Standard good practice. Will be adopted as part of assessment.
Public Health England	<i>'...expect the promoter to provide details of any hazardous contamination present on site (including ground gas) as part of the site condition report.'</i>	Standard good practice. Will be adopted as part of assessment.
Public Health England	<i>'Emissions to and from the ground should be considered in terms of the previous history of the site and the potential of the site, once operational, to give rise to issues. Public health impacts associated with ground contamination and / or migration of material off-site should be assessed and the potential impact on nearby receptors and control and mitigation measures should be outlined.'</i>	Standard good practice. Will be adopted as part of assessment.
Public Health England	<i>'Where available, the most recent UK standard for the appropriate media (e.g. soil, water) and</i>	Standard good practice. Will be

Consultee	Comment	Response
	<i>health-based guidance values should be used when quantifying the risk to human health.'</i>	adopted as part of assessment.
HS1	<i>'This study should consider: the potential effects of dusts, contaminants and gasses on human health of station staff and passengers; ...HS1 structures, cabling and other signalling equipment; how the verification reports of the design and built works can be reviewed by HS1.'</i>	Information will be obtained and documented as part of baseline assessment. Verification reports will be publicly available.

CONSULTATION FEEDBACK

17.14 Consultation feedback has been received from Statutory Consultees in response to information presented in the Preliminary Environment Information Report, produced in relation to the London Paramount Project in April 2015. The responses are summarised in Table 17.3. An initial telephone meeting was also held with the Environment Agency (Sustainable Places) on 27 March 2020 to reintroduce the project and agree a process for future liaison with the various Environment Agency teams, including Waste and Contamination.

Table 17.3: Summary of comments received from Statutory Consultees in response to Preliminary Environmental Information Report.

Consultee	Comment	Response
Dartford Borough Council	Plan shows that part of the Northfleet Landfill is being acquired. The Council is not clear on how this will be managed. The landfill site is monitored and managed as a single entity (for example, gas monitoring).	Noted and understood. Relevant also to the Environment Agency comment below.
Dartford Borough Council	Council wishes to be involved in the development of the remediation strategies.	Noted and understood.
Environment Agency	There are existing waste facility and landfill management permits that cover areas within the red line boundary. The Environment Agency emphasise that the implications of the Proposed Development on these permits must be understood. Advise that sufficient information should be provided with the DCO submission (and Environment Agency given opportunity to review in advance if necessary) to demonstrate awareness of the permitting implications of the	Noted and understood.

Consultee	Comment	Response
	Proposed Development.	
Environment Agency	If boreholes are required to be drilled through landfills, proposals for these works must be submitted by the landfill operator to the Environment Agency.	Noted and understood.
Gravesham Borough Council	PEIR incorrectly states that the local authority was consulted with regards to Phase 1 investigations. No site-specific information provided on which to comment, but basic proposals appear to cover all potential issues. Recommends that site investigation is undertaken as soon as possible to allow consultation.	Noted and understood.
MMO	High level mitigation measures are provided. The ES should include a full assessment of why such mitigation measures have been deemed necessary, the potential impacts of using such measures, and any residual impacts. Particular reference is made to cement kiln dusts, measures to prevent leachate from them, and responses should an incident occur.	Noted and will be implemented in ES chapter.
MMO	Notes that potential receptors are identified as including water bodies and infrastructure, however marine species have the potential to be affected if contamination leaches into the marine environment. This should be considered within the ES.	Noted and will be implemented in relevant ES chapter.
Natural England	Natural England note that all the options proposed will have a direct impact on the Baker's Hole SSSI (notified for Pleistocene Deposits). Stated that it is very difficult to determine from the soils section of the PEIR what comments relate specifically to the SSSI. It would be useful to have a detailed map showing the areas being discussed and a clear distinction between effects on the non-designated areas of geological interest and the SSSI.	Noted and understood.
Public Health England	Makes reference to the 2014 Scoping Report. Note that PHE are generally satisfied with the proposed methodology. PHE would expect to see that the detailed quantitative and cumulative assessments proposed are undertaken and provided.	Noted and understood.

BASELINE CONDITIONS AND MAIN ISSUES

17.15 A baseline assessment covering the geology, hydrology, hydrogeology and geoenvironmental conditions will be provided as part of the ES chapter. The Kent Project Site and Essex Project Site will be assessed separately. The baseline for the two projects sites, as understood at present, are summarised below.

- 17.16 In the area of the Kent Project Site, it is known that the natural geology across the Kent Project Site in the vicinity of the River Thames comprises a substantial thickness of Alluvium (peat, silty clays and sands & gravels) underlain at depth by the Chalk. In this area, the natural deposits are overlain by a substantial but variable thickness of Made Ground (Fill) composed of cement kiln dust (CKD). This material is generating leachate which is currently subject to active control and treatment. Away from the Thames, the Chalk is present at ground level (in places overlain by the Thanet Sands) but these strata have been extensively quarried. In places, the quarries have been left as unrestored land (and now form low lying areas, some with standing water bodies) and others have been filled with domestic and industrial wastes. Some of these landfills include active gas and leachate management facilities.
- 17.17 There are several licensed waste management facilities in the area of the Kent Project Site, but none of these have been determined as '*Contaminated Land*' under the Environmental Protection Act 1990.
- 17.18 Available information indicates the geology at the Essex Project Site to comprise Made Ground (between about 1 and 3m thick). This is underlain by about 15m of Alluvium (peat, clays, sand and gravels), followed by a limited thickness of River Terrace Gravels. The Upper Chalk is present at about 20 to 22m below ground level (bgl). Historically, the site is known to have formed part of the Port of Tilbury, and has been occupied by a gasworks, coal sidings, cargo handling facilities, workers' cottages and a railway station.
- 17.19 The detailed ground engineering assessment will be carried out in two phases. Separate assessments will be undertaken for the Essex Project Site and Kent Project Site. Phase 1 will comprise a desk-based study of existing data and will be carried out prior to the preparation of the ES chapter.
- 17.20 The Phase 1 desk study will comprise the following tasks for each of the two project sites:
- collation and review of existing reports and data pertinent to the Project Site and the objectives;
 - determination of land use history by review of historical maps, data provided by landowner and other publicly available data (e.g. local library sources, the Internet);
 - determination of ground conditions (geological, hydrogeological, geotechnical and geoenvironmental) by review of published maps (British Geological Survey), existing site investigation reports and data from the Environment Agency/other authorities;
 - determination of regulatory compliance by review of public register information from local authority and Environment Agency;
 - performing a desk based Unexploded Ordnance (UXO) risk assessment;

- undertaking a site walkover survey - carried out to confirm current use, to identify surrounding land uses which could impact upon the Project Site, to determine possible constraints on any site investigations; and
- preparation of a desk study report to include the construction of an Initial Conceptual Site Model, a Contamination Preliminary Risk Assessment, together with identification of the need for, nature and scope of any subsequent works (including intrusive investigation and remediation) necessary to enable safe redevelopment.

17.21 Phase 2 will comprise intrusive investigations targeted to provide data necessary to fill any critical information gaps identified in Phase 1. Further, more detailed site investigations will be undertaken in due course with combined geotechnical and geoenvironmental objectives.

PRELIMINARY ASSESSMENT OF POTENTIAL EFFECTS

17.22 A preliminary assessment, involving establishing the high-level baseline conditions (described above) and identifying the main potential effects arising from land contamination at the Project Site (prior to the incorporation of mitigation measures), has been undertaken. The potential effects are summarised in Table 17.4. No assessment of significance has been carried out.

Table 17.4: Resources / Receptors and potential effects

Receptor	Effect
Construction Workers	Direct or indirect ingestion of contaminated soil and groundwater, inhalation, dermal contact. Inhalation of contaminated dusts and/ or hazardous fibrous substances.
Future Site Users (residents/workers/visitors)	Direct or indirect ingestion of any residual contaminated soil, inhalation of contaminated dusts and/ or hazardous fibrous substances, dermal contact in areas of soft landscaping. Exposure to hazardous atmospheres presented by accumulation of flammable or asphyxiating ground gases and vapours in enclosed spaces or outside.
Surrounding Land Users (neighbours)	Inhalation or deposition of wind-borne contaminated dusts and/ or hazardous fibrous substances [mainly during construction but also in operation]. Exposure to hazardous atmospheres presented by migration of contamination via permeable strata and in air.

Receptor	Effect
Controlled Waters (groundwater and surface waters)	Contamination of water resources with consequent reduction in water quality. Impacts to aquatic environment.
Ecology	Phytotoxic impacts on plant species. Toxic impacts on fauna.
Built Environment	Chemical attack on buried concrete structures. Permeation of plastic pipes and contamination of water supply.

APPROACH AND METHODOLOGY

Defining the conceptual site models

17.23 The following methodology will be utilised to assess the Proposed Development against the baseline at each of the two project sites. A conceptual model of the Project Site that describes the environmental features together with the expected interaction of potential contamination sources with the environment will be developed. This will be done by undertaking a Source – Pathway – Receptor analysis of the Project Sites in accordance with the guidance documents referred to above. These terms as defined below:

- Sources. Potential or known sources of potential contamination associated with historic or recent/ current land uses (e.g. disposal of wastes, spills and leaks).
- Pathways. Mechanisms/ systems thorough which exposure of a receptor to a contaminant could occur e.g. direct contact with contaminated soils, migration through air, over land or via permeable ground.
- Receptors. Receptors of varying sensitivity that could be adversely affected by contact (direct or indirect) with a contaminant. E.g. people living, working or visiting the Project Site and surrounding area, groundwater and surface water bodies, ecological resources (flora and fauna).

17.24 Where a source, relevant pathway and receptor are present a “contaminant linkage” is created whereby there is a circumstance through which some level of environmental harm could occur, which has to be assessed and mitigation identified as appropriate.

17.25 Baseline conditions for each of the two project sites will be assessed for the development confines and for a distance of up to 250m beyond. Consideration of this ‘halo’ around the Project Site boundaries is necessary in order to take into account the potential for off-site contamination sources and for the potential for impact upon off-site receptors.

17.26 The baseline data for each of the two Project Sites will be sourced from desk-based study and site walkover surveys. Review will be undertaken of published information and existing borehole data published by the British Geological Survey, together with available extensive data on the geological and geoenvironmental conditions from existing site investigations and remedial activities. Intrusive site investigations will be carried out necessary to resolve any key uncertainties for the purposes of the Environmental Statement (further, more detailed intrusive site investigations will be carried out in due course).

Assessment significance criteria

17.27 The methodology for impact prediction is based on assessing both the magnitude of the changes expected and the sensitivity of the receptors. Criteria for assessing the significance of potential human and environmental impacts will be based on a qualitative assessment of the magnitude of the impact, or how far the impact deviates from the baseline condition, and the receptor sensitivity.

17.28 The resources/receptors outlined in Table 17.4 will be considered in the assessment. It is not anticipated that these resources/receptors will all be significantly affected but it is necessary to demonstrate that these important receptors have been considered. Incorporation of mitigation such as personal protective equipment (PPE) and the health & safety regime for construction workers will address the majority of any potential health risks associated with the development itself. The main potential effects arising from land contamination at the Project Site, prior to the incorporation of mitigation measures are also identified in Table 17.4.

17.29 Receptors are considered to have varying degrees of sensitivity to contamination potentially present beneath the Project Site, based on the potential scale of exposure and the integrity of any site-specific exposure pathways. The scale of receptor sensitivity is defined in Table 17.5.

Table 17.5: Criteria for determining receptor sensitivity

Sensitivity	Description
High	<p>People (on site or on neighbouring properties) occupying land in residential use with gardens or using allotments, children's play areas etc.</p> <p>Construction workers engaged in extensive earthworks.</p> <p>Major aquifer of regional importance used for potable water supply. Highly ecologically sensitive watercourse or water bodies.</p> <p>Nationally or internationally designated ecological sites.</p> <p>Buildings of high historic or local importance.</p>
Moderate	<p>People (on site or on neighbouring properties) occupying land in residential use without gardens or using public areas of soft landscaping / open spaces.</p> <p>Construction workers engaged in moderate earthworks.</p>

Sensitivity	Description
	<p>Minor aquifer, local watercourse or non-designated water bodies not used for large scale human consumption which can be used for industrial purposes; may be important for local recreational purposes.</p> <p>Locally designated ecological sites.</p> <p>Buildings, including services and foundations.</p>
Low	<p>People (on site or on neighbouring properties) occupying or using commercial or industrial buildings, car parking, hard landscaping.</p> <p>Construction workers site but with minimal disturbance to the ground.</p> <p>Non-potable water resources, water body of low recreational qualities.</p> <p>Sites of low ecological value, and flora and fauna occupying non-designated open areas.</p> <p>Infrastructure (e.g. roads, highways and railways).</p>
Very Low	<p>Land with no access to people and no neighbouring properties.</p> <p>Construction workers on site, but with no disturbance to the ground on site.</p> <p>Non-aquifer, no nearby watercourses or water bodies within 1km.</p> <p>No sites of significant ecological value and no built development within 1km.</p>

17.30 The criteria used to assess the magnitude of effects will be based on a qualitative assessment of the potential seriousness of the effect or how far the effect deviates from the baseline condition and the period of time that the effect could last (see Table 17.6).

Table 17.6: Criteria for determining effect magnitude.

Magnitude	Description
Large	<p>Short term (acute) or long term (chronic) adverse effects on human health, broadly equivalent to “significant harm” as defined by the Environmental Protection Act 1990).</p> <p>Persistent and extensive pollution of water resource or ecosystem equivalent to Category 1 pollution incident (major pollution release).</p> <p>Catastrophic damage to crops / building / infrastructure.</p>
Medium	<p>Short term (acute) or long term (chronic) adverse effects on human health but not equivalent to “significant harm” as defined by the Environmental Protection Act.</p> <p>Non-persistent pollution of water resource or ecosystem equivalent to Category 2 pollution incident (moderate pollution release).</p> <p>Significant damage to crops / buildings / infrastructure (on or off site).</p> <p>Contamination of off-site soils.</p>
Small	<p>Easily preventable, non-permanent health effects on humans.</p>

Magnitude	Description
	Minor, low-level, localised, temporary pollution of water resources or ecosystem. Easily repairable damage to crops / buildings / infrastructure. Easily preventable, permanent health effects on humans. Localised damage to buildings / infrastructure (on or off site).
Negligible	No discernible negative effects.

17.31 The combination of the sensitivity of the receptor and the magnitude of the impact will provide an indication of the level of contamination on the Project Site, and the nature and severity of possible effects. It should be noted that both rankings may vary in accordance with the different scenarios being considered (i.e. baseline, construction and operation).

17.32 Positive or negative effects during construction and when the Project Site is operational will be identified. The positive effects are associated with the mitigation of risks associated with contamination. The negative effects are temporary during the construction phase and relate to the increased potential for contaminant exposure (e.g. from the generation of contaminated dusts) and long term from the use of the Project Site during the operational phase (and any residual contamination if remediation was inadequate or not carried out).

PROPOSED AVOIDANCE AND MITIGATION MEASURES

17.33 The following mitigation measures are likely to be proposed during the process of considering significant adverse effects associated with soil and ground conditions:

- Detailed site investigations, sampling, monitoring and risk assessments which will inform both the remedial strategy and the geotechnical designs.
- The preparation of a Code of Construction Practice which will set out the procedures for the protection of human health, controlled waters, flora, fauna and the built environment.
- Definition and implementation of an appropriately rigorous health and safety regime for all construction workers involving below ground activity.
- Adoption of good construction practice to prevent the migration of contamination via air (as dust or vapour) and water (surface water run off or via permeable strata).
- Design and construction of gas protection measures to new buildings and structures. Also, to ensure continued performance of existing landfill gas control systems and prevention of off-site migration of landfill gas.

- Undertaking a Foundation Works Risk Assessment to inform foundation solutions and ensure mitigation of risk to groundwater quality.
- Long term maintenance of existing leachate management system (Kent Project Site) or installation of a new system, with appropriate controlled access.
- Particular remedial action (treatment, isolation or removal) of any areas of gross contamination.
- Implementation of appropriate precautions to protect any below ground activity against unexploded ordnance
- Design and construction of below ground structures against aggressive ground conditions.
- Provision of appropriate thicknesses of suitable sub soil and topsoil in areas of soft landscaping and public open space.
- Preparation of Verification Report(s) to demonstrate that the remedial actions have been carried out in accordance with the Strategy and accordingly that construction activities have not given rise to unacceptable risks to people or the environment in both short and long term.

UNCERTAINTIES

17.34 The principal sources of information that will be used to prepare the ES chapter describe the baseline conditions at both Project Sites will be the Phase 1 desk study report. As described above this report will be informed by review of historical and current topographical maps, public register information, information from the British Geological Survey, Environment Agency and other online sources, existing site investigation and monitoring data, together with observations from the site walkover surveys. This scope and methodology of this work will be designed to provide a reasonable level of certainty about ground conditions. Any key gaps or critically important uncertainties will be addressed by particular investigation, monitoring or assessment (with design level information to be obtained by more comprehensive site investigations in due course).

17.35 However, it is important to recognise that there are inherent uncertainties associated with ground conditions and the data that informs its understanding, both geotechnical and geoenvironmental. For example, geological strata can be very consistent or highly variable, both laterally and vertically. Similarly, contamination can be both widespread and relatively localised, depending upon its source, location, nature and mobility. No investigation, however comprehensive can be expected to determine absolutely the geological conditions, the geotechnical parameters or the nature and extent of

contamination which could be present on any site. There will always be an element of uncertainty about the ground conditions, including contamination.

- 17.36 This potential for uncertainty must (and will) therefore be taken into account in any risk assessment (including Environmental Assessment) for example, in the assessment of the need for, scope and design of the remediation strategy, in geotechnical design, in health and safety planning, in financial risk management and in the implementation of any remediation works.
- 17.37 Accordingly, when carrying out the assessment, consideration will also be given to the level of uncertainty associated with each of the identified potential sources of contamination and also with the migration pathways that could link such sources to any of the identified receptors. For example, much of the information will be based upon historical records which are likely to be partial and will not be complete. The existing site investigation reports will not provide current, comprehensive, design level data. Because of this uncertainty, the identification of the sources will be based upon and reflect a conservative assessment of the potential location, nature and extent of the source(s), including the potential for currently unforeseen contamination). The probability or likelihood of the hazard being realised will then be assessed by consideration of the directness / integrity of the potential exposure pathways that could link the receptor to the source and the uncertainties associated with those pathways. As described above, the assigned level of risk will be determined by the terms of consequence and probability in accordance with the relevant guidance, but it will also take into account the uncertainties associated with all the elements of the contaminant linkages.

MATTERS TO BE SCOPED OUT

- 17.38 No matters to be scoped out have been identified.

REFERENCES

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- [14] gov.uk, "Land contamination: risk management," 23 December 2019. [Online]. Available: <https://www.gov.uk/guidance/land-contamination-how-to-manage-the-risks>.
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Eighteen ◆ Waste and materials

INTRODUCTION

- 18.1 The Proposed Development has the potential to generate significant amounts of waste during its construction and operation. A development of this scale has the potential to create significant new demand on existing waste infrastructure at the local and regional level. Equally, the use of natural resources through material consumption is important to consider in terms of environmental impact from new developments. On a national scale there is pressure to reduce consumption and maximise opportunities to support a circular economy.
- 18.2 The Institute of Environmental Management and Assessment (IEMA) produced a guidance document *Materials and Waste in Environmental Impact Assessment (2020)*, which sets out a methodology to assess the impacts and associated effects of material consumption and disposal of waste within EIAs. The IEMA guidance will be used to assess the waste and materials effects for the Proposed Development. Additionally, local authority guidance for planning of new developments will be used where available. Where impacts are deemed significant, mitigation measures will be identified.
- 18.3 The assessment will include materials required during construction stages. Operational materials are scoped out as this would consist of goods for retail, food, beverage and hotel uses consumed by visitors, with materials defined in the IEMA guidance as physical resources used across the lifecycle of the development such as concrete, aggregate, asphalt, brick, ballast, mortar, glass and timber. These materials would be required for maintenance and repair of the Proposed Development but considered not significant compared to the construction phase. Waste generated during both construction and operational waste will be assessed.

RELEVANT LAW, POLICY AND GUIDANCE

National Policy Statements

- 18.4 National Policy Statements (NPS) set out the need for and government's policies to deliver Nationally Significant Infrastructure Projects (NSIPs) in England. Chapter three of this scoping report outlines that there is no NPS for business and commercial NSIP projects. However, to the extent that the Project includes transport and highways infrastructure that will create significant demand for construction materials and with the potential to give rise to construction waste, regard will be given to relevant policy in the NPS for National Networks, including:

- Environmental and social impacts (NPS paragraphs 3.2 to 3.5)

- Criteria for “good design” for national network infrastructure (NPS paragraphs 4.28 – 4.35)
- Pollution control and other environmental protection regimes (NPS paragraphs 4.48 – 4.56)
- Waste management (NPS paragraphs 5.39 – 5.45)
- Dust, odour, artificial light, smoke, steam (NPS paragraphs 5.81 – 5.89).

Other relevant policies and guidance

18.5 The following documents will be considered in the assessment:

- National Planning Policy Framework 2019, Ministry of Housing, Communities and Local Government, 2019;
- National Planning Policy for Waste, Department for Environment, Food and Rural Affairs, 2014;
- Our waste, our resources: A strategy for England Department for Environment, Food and Rural Affairs, 2018;
- Government Review of Waste Policy, Department for Environment, Food and Rural Affairs, 2011;
- Waste Management Plan for England, Department for Environment, Food and Rural Affairs, 2013;
- WRAP Designing out Waste: a design team guide for civil engineering;
- Marine and Coastal Access Act: Marine Management Organisation, 2009; and
- IEMA guide to Materials and Waste in Environmental Impact Assessments, 2020.

18.6 The assessment will also consider the following locally relevant policy and guidance in terms of waste and materials:

- Kent Minerals and Waste Local Plan 2013 -2030;
- Kent Waste Disposal Strategy 2017 – 2035, Kent County Council;
- Gravesham Local Plan Core Strategy, Gravesham Borough Council, 2014

- Dartford Core Strategy, Dartford Borough Council, 2011
- Dartford Development Policies Plan, Dartford Borough Council, 2017
- Essex and Southend-on-Sea Waste Local Plan, Essex County Council, 2017
- Essex Minerals Local Plan, Essex County Council, 2014
- Joint Municipal Waste Management Strategy for Essex (2007 to 2032), Essex County Council, 2008
- Local Development Framework: Core Strategy and Policies for Management of Development, Thurrock Council, 2015;
- Municipal Waste Strategy for Thurrock 2008-2020, Thurrock Council, 2007;
- Assessment of Thurrock Minerals and Waste Sites Issues and Options, Thurrock Council, 2009; and
- Thurrock Local Plan: Sustainability Appraisal Scoping Report Thurrock Council, 2016.

THE 2014 SCOPING OPINION

18.7 Table 18.1 summarises the recommendation relevant to waste and materials in the Secretary of State’s 2014 scoping opinion for the London Resort.

Table 18.1 Summary of comments from the 2014 Scoping Opinion report relevant to waste and materials

Scoping opinion paragraph	Scoping opinion comment	Response
3.83	‘...production of a range of different types of waste throughout the construction, operational and decommissioning phases of the development. The applicant’s Site Waste Management Plan (SWMP) should be appended to the ES.’	Noted and will be addressed in both the ES and SWMP document.

Scoping opinion paragraph	Scoping opinion comment	Response
3.84	The Secretary of State encourages the applicant to discuss their proposed approach with the EA and the relevant waste disposal authority, as well as the MMO if intending to dispose of dredged material in the marine environment, to establish an appropriate methodology and evaluation criteria and ensure that all types of wastes and their effects are considered. The applicant should note that KCC highlight the planned adoption of the emerging Kent Minerals and Waste Local Plan 2013-30 in 2015 in their response in Appendix 2.	Noted and will be implemented in the ES chapter. The EIA will also take into account waste policy relevant to Thurrock.
3.85	It is essential that the assessment accounts for materials to be removed from the site and to identify where potential traffic movements would be routed. Such details should also be reflected in relevant supporting documents (e.g. the SWMP).	Noted and will be addressed in both the ES and SWMP document.
3.86	Where the re-use of construction waste on site is proposed to minimise the need for the export and import of material the ES should describe the method used to calculate the likely cut and fill balance of material.	Noted and will be addressed in both the ES and SWMP document.
3.87	Some of the effects linked to waste (e.g. on air or water quality) would be covered in other chapters of the ES. The interrelationship between the chapter on waste and these other chapters should be clearly explained in the ES and cross referenced, where appropriate.	Noted and will be implemented in the ES chapter.
3.88	The ES should describe any mitigation measures necessary to deal with adverse impacts and identify any residual effects. The ES should also make it clear how mitigation measures would be secured and delivered in the DCO.	Noted and will be implemented in the ES chapter

CONSULTATION FEEDBACK

- 18.8 In addition to informal consultation meetings at the early stages of the Proposed Development, formal consultation feedback relevant to waste is summarised in this section.
- 18.9 In 2015, consultation by London Resort Company Holdings (LRCH) resulted in some comments regarding waste. This feedback has been taken into consideration for this scoping chapter. The feedback is summarised in Table 18.2 below.

Table 18.2 Summary of comments from the 2015 consultation by LRCH

Ref no	Organisation	Comment (summarised)	Response
CON/LT 18	Environment Agency	Little detail on waste, need to cover the permitting implications of moving waste and of new waste facility. To review information and advise mitigation for risk to people and environment.	The applicant engaged with the EA regarding need for a strategy to address the environmental permitting issues (existing and future) and the related materials movements/ re-deposition during construction. The applicant will produce an outline paper mid-July 2020 for further discussion and agreement with the EA and a more complete strategy will form part of the wider Earthworks and Remediation Strategy document which will accompany the ES Soil and Ground Conditions Chapter. In terms of operational waste management, the applicant is developing a strategy and when more is defined, the applicant will take into consideration the need and requirements for any permits in relation to the provision of waste activities.

BASELINE CONDITIONS AND MAIN ISSUES

- 18.10 The assessment will include consumption of materials required during construction and waste generated from activities during the construction and operation of the Proposed Development. This includes excavation and demolition materials and waste during the construction phase, the geo-environmental impact from excavated material be will

assessed in the Soils, Hydrogeology and Ground Conditions of the EIA. Waste water will be assessed in the Water chapter of the ES, liquid waste is therefore not assessed in the waste and materials chapter.

18.11 In order to assess the effects of the Proposed Development on waste-sensitive receptors, the following baseline data will be collected:

- Replicable developments and similar landuse components will be investigated and any waste strategies (construction and operational) for the site will be consulted to ascertain predicted waste generation rates;
- An understanding of all influential and relevant waste legislation in the Kent and Essex areas will be obtained;
- Review of local facilities for waste management and their capacity will be undertaken.

18.12 To assess the effects of the Proposed Development regarding material demand and consumption during construction, the following baseline data will be examined where available:

- Regional and national availability of the main materials required for the Proposed Development;
- Estimated demand of materials required for the Proposed Development;
- Information on any materials that will comprise of recycled content, sustainability credentials, volumes of excavated materials that can be reused or recycled.

PRELIMINARY ASSESSMENT OF POTENTIAL EFFECTS

Potential construction effects

18.13 An assessment of significance has not yet been carried out. Depending on phasing, waste generated from construction activities can be significant for a whole project and at specific points of a build project. If mitigation measures are not implemented, larger pulses of waste creation can occur and become difficult to manage, in terms of management, handling, transport and treatment. These can lead to further impacts related to air quality and transport issues. The waste arising at the individual main stages of construction, such as the early build stage or the later fit out, are key areas of concern and will be considered in the EIA.

18.14 Effects from material use include: consumption and depletion of resources that can temporarily or permanently degrade soils; land and the natural environment, which can

result in indirect effects such as release of greenhouse gas emissions from the transport of materials; water consumption; visual impacts; and, negative impact on human health.

- 18.15 Any significant adverse effects from waste and materials will be addressed through mitigation measures. These will be suggested based on an assessment of material demand against existing stocks of the relevant material types nationally. It is also possible that materials will be sourced internationally. Examples of mitigation measures are outlined in the Proposed Avoidance and Mitigation Measure section of this chapter.

Potential operational effects

- 18.16 An assessment of significance has not yet been carried out. In the absence of appropriate avoidance, minimisation and waste management strategies the Proposed Development would generate substantial quantities of operational waste which will include high levels of food and recyclable waste. Operational impacts and associated effects such as low recycling rates, high residual waste generation, offensive odours, visual and vermin impacts, could arise as a result of poor waste management provision and/or in the development. Lack of planning for on-site storage, movement and collection of operational waste could lead to unhygienic or non-compliant waste activities.

APPROACH AND METHODOLOGY

- 18.17 For this assessment, the IEMA guidance will be used to assess the sensitivity of receptors, magnitude of impact and significance of effects. Effects of material use and waste generation will be categorised according to the IEMA guidance.
- 18.18 Waste generated by the London Resort will be determined for the construction and operational phase. Construction and operational waste and recycling levels will be estimated using benchmarks from guidance such as British Standard 5906:2005 for operational waste and BRE standards for construction waste. Reduction measures will be detailed, and overall effects determined.
- 18.19 Making use of the development waste management strategy, operational waste generation estimates will be extracted. These estimates will be compared with local available capacity of waste infrastructure to confirm the effect significance. In addition, the proposed mitigation measures for the Project Site will be assessed in order to develop and evaluate the effects on local waste infrastructure.
- 18.20 The assessment will identify opportunities to respond to policy via means that reduce any adverse effects and increase the likelihood of beneficial effects of waste management through design (incorporated mitigation measures) and supplementary mitigation measures.
- 18.21 The assessment of potential impacts and associated effects from material demand and utilisation will include a review of the type and volume of materials required for the proposed development. Materials required for construction may include common

construction materials such as concrete, aggregate, asphalt bricks etc. These will be confirmed in the bill of quantities, and this assessment will target the main materials used only. Detail of the region(s) from which materials may be sourced will be included during assessment, as well as if any materials will comprise of any recycled or secondary content.

18.22 Cumulative effects with other committed developments that may have a cumulative effect on waste and material receptors will be considered. Where quantitative information is not available a qualitative assessment will be undertaken. Interactive in-combination effects with other EIA chapters such as transport, air quality and water quality will be assessed.

Assessment significance criteria

18.23 The significance of construction and operation waste effects is determined by the sensitivity and magnitude. This includes consideration of local and regional waste management facilities and the magnitude of impact based on the waste generated from the proposed development. In terms of waste sensitivity, the IEMA guidance provides methodology for determining the sensitivity of landfill void capacity, which is rated from Negligible to Very High sensitivity.

18.24 The sensitivity of materials, according to IEMA guidance, relates to the availability and type of resources to be consumed by a development. In this assessment, criteria from IEMA, will be used to determine the sensitivity of materials. The sensitivity can be determined using a sensitivity rating of Negligible to Very High, based of supply/stock of materials, as well as the sustainable properties of each material.

18.25 The IEMA guidance provides criteria for assessing magnitude and provides two approaches to determine the magnitude of impact for waste. Method 1 determines void capacity of landfill, which is the most robust approach, suitable for larger developments and statutory EIAs. It involves a detailed methodology using available industry data. The alternative approach, where data may not be available, is prioritising landfill diversion. Where Method 1 is not possible, Method 2 will be applied in this assessment. The assessment will assess based on landfill void capacity if data is available, where this is not available the diversion approach will be adopted. The impact magnitude ratings are outlined in Table 18.3.

Table 18.3 Magnitude of impact for waste

<i>(Inert and non-hazardous waste)</i>	No change	Negligible	Minor	Moderate	Major
Method 1 (landfill void capacity)	Zero waste generation	Reduce landfill void capacity by <1%	Reduce landfill void capacity by 1-5%	Reduce landfill void capacity by 6-10%	Reduce landfill void capacity by >10%

<i>(Inert and non-hazardous waste)</i>	No change	Negligible	Minor	Moderate	Major
Method 2 (landfill diversion)	100% landfill diversion	90-99% landfill diversion	60-89% landfill diversion	30-59% landfill diversion	<30% landfill diversion

18.26 The sensitivity of natural resource receptors and the methodology for assessing magnitude of impact from materials is outlined in the IEMA guidance. The methodology for assessing magnitude of impact comprises a percentage-based approach, measuring the volume of materials by percentage against regional or national baseline availability as outlined in the IEMA guidance and provided in Table 18.4.

Table 18.4 Magnitude of impact for materials

	No change	Negligible	Minor	Moderate	Major
Material magnitude	No materials are required	No material type is equal or greater than 1% by volume of the regional or national baseline availability	No material type is equal or greater than between 1-5% by volume of the regional or national baseline availability	No material type is equal or greater than by 6-10% by volume of the regional or national baseline availability	No material type is equal or greater than 10% by volume of the regional or national baseline availability

PROPOSED AVOIDANCE AND MITIGATION MEASURES

Construction waste and material mitigation

18.27 At design stages, measures to reduce natural resource consumption and waste generation can be incorporated. These measures will be developed in the Site Waste Management Plan (SWMP), examples include:

- Off-site fabrication;
- Use of standard sizing and modular design;
- Reduction of material demand through design measures;
- Consideration of the sustainability of materials; and

- Re-use of waste materials on-site.

18.28 Waste reduction measures through site waste management will be applied during construction stages. This includes on-site segregation of waste materials used for construction, as well as waste from demolition and excavation. Measures will be explored in detail as part of the Site Waste Management Plan.

Operational waste mitigation

18.29 During operation, planning and guidance will be followed to minimise waste where possible, through appropriate spatial storage for the segregation of recyclables in line with local waste facilities and policies. This will be outlined in the Operational Waste Management Plan and will become the responsibility of development owners and managers during operation.

UNCERTAINTIES

18.30 There are a number of uncertainties for materials that includes a limit on the level of detail available at the pre-planning stage about materials to be used in quantity and quality for the proposed development, material sources and regional or national availability of resources.

18.31 Waste uncertainties include potential limited data availability on void landfill capacity at local or regional levels and capacities at other waste infrastructure that recycle and recover waste.

18.32 It is acknowledged in the IEMA guidance that the document provides initial guidance, and that some principles and approaches are relevant to all development sectors, but some will not. Where information is not available, in particular for materials, professional judgement may be required to undertake the assessment.

MATTERS TO BE SCOPED OUT

18.33 Materials consumed during operational stages of the proposed development will be scoped out of this assessment. Due to the nature of the development, the use and consumption of material during operation is considered not to be significant.

Nineteen ◆ Greenhouse gas emissions and climate change

INTRODUCTION

- 19.1. This chapter of the EIA Scoping Report sets out the proposed approach to assessing the nature and magnitude of effects relating to climate change. It is proposed that a climate change ES chapter will assess:
- the effects of the Proposed Development on climate change, in respect of greenhouse gas (GHG) emissions;
 - the effects of climate change on the Proposed Development, including the need for climate change adaptation and resilience.
- 19.2. Buildings and construction account for 39% of the world’s GHG emissions. Of this, operational emissions from energy used to heat, cool, and light and run buildings account for 28%, while 11% comes from embodied emissions including the GHG emissions associated with materials and construction processes throughout the building lifecycle¹. Additionally, the built environment is becoming increasingly vulnerable to the intensifying effects of climate change. Therefore, it is desirable that future buildings are designed in a way that both minimises their GHG emissions and increases their resilience to the effects of climate change.

RELEVANT LAW, POLICY AND GUIDANCE

UK Law

UK Climate Change Act 2008 (2050 Target Amendment)

- 19.3. This Act originally required the UK to reduce carbon emission by at least 80% by 2050 from a 1990 baseline. On 27th June 2019, the UK Government increased the ambition to 100% reduction in carbon emissions by 2050.
- 19.4. Section 56 requires the UK Government to undertake a climate change risk assessment on a five-yearly cycle, with the subsequent development of an adaption programme to deliver resilience against these risks.

¹ World Green Building Council, 2019

Infrastructure Planning (Environmental Impact Assessment) Regulations 2017

19.5. The 2014 EUEIA Directive was transposed into English law through the 2017 update to the Infrastructure Planning (EIA) Regulations (herein referred to as the EIA Regulations). This update means that there is now a specific requirement to consider climate change mitigation and adaptation in the EIA process. The EIA Regulations state that the Environmental Statement should include:

‘a description of the likely significant effects of the development on the environment resulting from, inter alia... (f) the impact of the project on climate (for example the nature and magnitude of GHG emissions) and the vulnerability of the project to climate change’.

National Policy***National Policy Statements***

19.6. National Policy Statements (NPS) set out the need for and government’s policies to deliver Nationally Significant Infrastructure Projects (NSIPs) in England. Chapter three of this scoping report explains that there is no NPS for business and commercial NSIP projects. However, to the extent that the Project includes transport and highways infrastructure, regard will be had to relevant policy in the NPS for National Networks, including:

- Environmental and social impacts (NPS paragraphs 3.2 to 3.5);
- Emissions (NPS paragraphs 3.6 - 3.8)
- Sustainable transport (3.15 to 3.18)
- Criteria for “good design” for national network infrastructure (NPS paragraphs 4.28 – 4.35);
- Climate change adaptation (NPS paragraphs 4.36 – 4.47);
- Carbon emissions (NPS paragraphs 5.16 – 5.19);
- Coastal change (NPS paragraphs 5.67 – 5.80);
- Flood risk (NPS paragraphs 5.90 – 5.115).

National Planning Policy Framework (NPPF) (2019)

19.7. Section 14 of the NPPF 2019 focuses on meeting the challenge of climate change, flooding and coastal change. As part of this, new developments should be planned in ways that:

- avoid increased vulnerability to the range of impacts arising from climate change. When new development is brought forward in areas which are vulnerable, care should be taken to ensure that risks can be managed through suitable adaptation measures, including through the planning of green infrastructure;
- can help to reduce greenhouse gas emissions, such as through its location, orientation and design. Any local requirements for the sustainability of buildings should reflect the Government’s policy for national technical standards.

Regional and Local Policy

19.8. The Proposed Development is split across a number of local authority areas. The main Kent Project Site is split across Dartford Borough Council and Gravesham Borough Council and within the overall jurisdiction of Kent County Council. The Essex Project Site lies within Thurrock Council, which is a unitary authority. This section summarises planning and environmental policies for each of these Local Planning Authorities. Additionally, the redevelopment of Swanscombe Peninsula falls within the wider Ebbsfleet Garden City vision being developed by Ebbsfleet Development Corporation, therefore a summary of the inclusion of climate change in the Ebbsfleet Implementation Framework has also been provided.

19.9. The following section summarises strategies developed by Kent County Council.

Kent and Medway Energy and Low Carbon Strategy 2020

19.10. Kent County Council recognised the UK climate emergency at a County Council meeting on 23 May 2019. In response to declaring a climate emergency, Kent County Council have prepared the Kent and Medway Energy and Low Emissions Strategy, working with Medway Council and all 12 district and borough councils. This strategy sets out how the county will achieve net-zero emissions, reduce fuel poverty and eliminate poor air quality, whilst supporting clean, sustainable economic growth. The draft strategy was consulted on in summer 2019, and the final strategy will be published in spring 2020.

Kent Climate Change Risk and Impact Assessment 2020

19.11. As well as setting out an Energy and Low Emissions Strategy to account for climate change mitigation, Kent County Council will publish a Climate Change Risk and Impact Assessment in spring 2020.

Kent Environment Strategy 2016

19.12. Theme 2 of the Kent Environment Strategy focuses on ‘making best use of existing resources, avoiding or minimising impacts’. Within this theme there is a section on ‘energy use and emissions’, which outlines Kent’s current energy consumption and GHG emissions, as well as commitments. Subsequently, reducing the usage of resources and

wasting less provides the focus for priority 6 of Theme 2, which is to ‘improve our resource efficiency such as energy, water and land’.

Dartford Borough Council Core Strategy 2011

19.13. The Dartford Borough Council Core Strategy 2011 includes the following policies relating to climate change mitigation and adaptation:

- Policy CS 14: Green Space;
- Policy CS 23: Minimising Carbon Emissions;
- Policy CS 24: Flood Risk;
- Policy CS 25: Water Management.

Dartford Borough Council New Local Plan: Preferred Options 2020

19.14. A Preferred Options public consultation held in January – February 2020, setting out emerging proposals of the new Dartford Borough Council Local Plan. Section H focuses on ‘Renewable Energy and Water Management’, stating the following:

‘The Council recognises the serious impact of climate change and that we are facing a climate emergency. It welcomes the Government’s commitment to meet the Intergovernmental Panel on Climate Change target to cut greenhouse gas emissions to net zero by 2050 but aspires to see the effects of climate change tackled earlier than either the 2050 national target or the 2030 date proposed by some. It is committed to increasing efforts to work with highways partners to reduce car use and provide solutions to prioritise pedestrians, cyclists and calmer, safer traffic. The policies in the Local Plan review will seek to minimise carbon emissions and address climate change by:

- *Locating new development in areas well served by facilities and public transport, including Fastrack, to reduce the use of private cars;*
- *Seeking improved train and bus services, as well as improved walking and cycling routes;*
- *Requiring the design of development to minimise the need for the regulation of internal temperatures and energy consumption;*
- *Supporting the provision of decentralised energy and heating facilities and renewable and low carbon energy schemes and technologies;*
- *Encouraging the use of electric vehicles;*

- *Protecting and increasing greenspace in both the urban and rural area;*
- *Protecting and enhancing tree planting;*
- *Protecting the borough from risks of flooding including enabling the implementation of the TE2100 plan; and*
- *Aiming for resilience from the future impacts of climate change’.*

19.15. Whilst this is not currently adopted policy, it represents the direction that Dartford Borough Council are heading in regarding climate change related policy.

Gravesham Local Plan Core Strategy 2014

19.16. Policy CS18: Climate Change of the Gravesham Local Plan Core Strategy 2014 covers the following topics:

- Flood risk;
- Water quality;
- Sustainable drainage and surface water runoff;
- Water demand management;
- Carbon reduction.

Thurrock Local Development Framework Core Strategy and Policies for Management of Development (as amended) 2015

19.17. The following two Core Strategy Thematic Policies relate to climate change:

- CSTP25: Addressing Climate Change;
- CSTP26: Renewable or Low-Carbon Energy Generation.

19.18. Additionally, the following two Policies for Management of Development relate to climate change:

- PMD12: Sustainable Buildings;
- PMD13: Decentralised, Renewable and Low Carbon Energy Generation;
- PMD14: Carbon Neutral Development.

Ebbsfleet Development Corporation Ebbsfleet Implementation Framework 2017

Delivery Theme 6 of the Ebbsfleet Implementation Framework focuses on ‘resilient & sustainable systems’. This Delivery Theme includes the following three objectives:

- *‘Identify innovative approaches and new and emerging technology to reduce carbon and to improve the efficiency of urban systems.*
- *Ensure homes and infrastructure are future proofed to be responsive to everybody’s individual and collective needs now and into the future.*
- *Develop a ‘Garden Grid’ to enhance the sustainability and resilience of Ebbsfleet by improving air quality and management of the urban water cycle.’*

Guidance***IEMA EIA Guide to: Assessing GHG Emissions and Evaluating their Significance (2017)***

19.19. IEMA published this guidance in response to the inclusion of climate change in the EIA Regulations. In the scoping section of this guidance, it states that:

‘a good practice approach to EIA will see GHG emissions scoped into the assessment and thus estimated, reported and mitigated as part of the project’s undertakings. This approach should follow for all projects regardless of whether there is a net increase or decrease in GHG emissions relating to the works.’

19.20. The guidance provides the following justification for scoping in a GHG emissions assessment:

- *‘All projects create GHG emissions that contribute to climate change;*
- *Climate change has the potential to lead to significant environmental effects; and*
- *There is a GHG emission budget that defines a level of dangerous climate change whereby any GHG emissions within that budget can be considered as significant.’*

19.21. Based on these principles, the guidance states that:

‘it might be considered that all GHG emissions are significant and an EIA should ensure the project addresses their occurrence by taking mitigation action.’

RICS Whole Life Carbon Assessment for the Built Environment (2017)

19.22. The purpose of this RICS guidance is to standardise whole life carbon assessment and enhance consistency in outputs by providing specific practical guidance for the interpretation and implementation of the methodology in BS EN 15978:2011.

BS EN 15978:2011 Sustainability of Construction Works – Assessment of Environmental Performance of Buildings – Calculation Method

19.23. The purpose of this Standard is to provide a consistent framework for the assessment of lifecycle GHG emissions associated with new and existing buildings.

IEEMA EIA Guide to: Climate Change Resilience and Adaptation (2015)

19.24. This guide was written in preparation for the 2017 update to the EIA Regulations. It provides a framework for the effective consideration of climate change resilience and adaptation in the EIA process.

19.25. The guidance states that:

‘where EIA is required, the scoping process should consider the significance of effects arising from climate change to ensure that appropriate project mitigation and risk management is included in the development.’

ISO 14090:2019 Adaptation to Climate Change – Principles, Requirements and Guidelines

19.26. The main purpose of this Standard is to provide organisations and projects with a consistent, structured and pragmatic approach to prevent or minimise the harm that climate change could cause and also to take advantage of opportunities.

THE 2014 SCOPING OPINION

19.27. Table 1 provides a summary of where climate change was referred to in the 2014 Scoping Opinion. The comments relating to climate change have been reflected within this scoping chapter.

Table 19.1 Summary of references to climate change in the 2014 scoping opinion

Consultee	Comment
Environment Agency	We support the use of the river for the transport of waste and construction materials during construction to mitigate against possible climate change impacts.
Kent County Council	There is very little reference to the need for sustainable management of energy and water in the scoping report. It states that a

Consultee	Comment
	<p>comprehensive strategy for service infrastructure with an emphasis on resilience and sustainability will be incorporated into the development (Para 3.52), however no further detail is provided.</p> <p>It is expected that a development of this size would have significant energy demand. There is reference to an energy centre being included in the development (para 10.4) this could have significant associated infrastructure and the impacts of this would need to be considered.</p> <p>A development of this scale should take every opportunity to deliver carbon reduction, renewable energy and water efficiency measures.</p> <p>Every effort should be made to reduce the carbon footprint of the development and consideration should be given to including a CHP/district heating system on the Project Site. Other energy efficient measures should be included, and renewable energy technologies explored including photovoltaic panels and wind turbines.</p>
Natural England	<p>The England Biodiversity Strategy published by Defra establishes principles for the consideration of biodiversity and the effects of climate change. The environmental statement should reflect these principles and identify how the development’s effects on the natural environment will be influenced by climate change, and how ecological networks will be maintained. The NPPF requires that the planning system should contribute to the enhancement of the natural environment ‘by establishing coherent ecological networks that are more resilient to current and future pressures’ (NPPF Para 109), which should be demonstrated through the ES.</p>

CONSULTATION FEEDBACK

19.28. A statutory consultation process was undertaken in April-June 2015. The consultation responses received as part of this process did not refer to climate change mitigation or adaptation. Due to the inclusion of climate change in the 2017 EIA Regulations, climate change will be included within the forthcoming round of consultation.

BASELINE CONDITIONS AND MAIN ISSUES

GHG emissions

19.29. For climate change mitigation, the baseline for the Proposed Development is defined as the current GHG emissions arising from activities and infrastructure within the Project Site boundary, in line with the IEMA (2017) guidance.

19.30. The proposed Kent and Essex Project Sites currently contain a number of different land uses, including capped landfill sites, industrial units, highways, vehicle storage compounds, ferry facilities and car parking. An estimate of the current operational energy usage of buildings on the Project Site will be determined using available Display Energy Certificates (DECs) or published benchmark data for the building typology (CIBSE TM46:2008 operational energy benchmarks). An estimate for the current GHG emissions associated with the other land uses on the Project Site shall be determined using available benchmark data.

Climate change adaptation

19.31. When assessing the effects of climate change on the Proposed Development, the baseline assessment shall be set out in each of the individual ES chapters in which the primary assessment is being undertaken.

PRELIMINARY ASSESSMENT OF POTENTIAL EFFECTS

GHG emissions

19.32. For climate change mitigation, the majority of the construction phase GHG emissions are expected to arise from the demand for physical materials (i.e. embodied carbon from building materials). An assessment detailing the embodied carbon of different building elements and how they interact with each other will be established.

19.33. During operation, it is anticipated that the operation of building services and transport to and from the Project Site will represent the majority of GHG emissions. Sources of GHG emissions for the demolition and construction and operation phases are listed below.

Construction emissions

19.34. Sources of GHG emissions during the demolition and construction stage are as follows:

- GHG emissions associated with demolition and waste removal;
- GHG emissions associated the extraction and manufacturing of building materials (i.e. the product stage); and
- GHG emissions associated with the transport of materials to the Project Site and construction and installation of products on the Project Site (i.e. the construction process stage).

Operational GHG emissions

19.35. Sources of GHG emissions during the operational stage are as follows:

- GHG emissions associated with the operational energy requirements for the day to day running of buildings (i.e. heating, cooling, lighting etc.);
- GHG emissions associated with maintenance, repair, replacement and refurbishment within buildings (i.e. the embodied carbon); and
- Transport emissions within and outwith the Project Site (for transport to and from the Project Site).

Climate change adaptation

19.36. For climate change adaptation, it is difficult to predict the significance of effects at this early stage, as the effects will be identified as the EIA progresses. However, a list of potential effects of climate change on the Proposed Development for the demolition and construction and operation phases can be seen below.

Potential construction effects

19.37. Potential effects of climate change on the development during the demolition and construction phase include:

- increased risk of flooding causing damage to physical assets and injury to construction staff;
- Increased likelihood of heatwaves causing risk of overheating to construction staff;
- increased wind speeds causing increased risk of damage to physical assets and injury to construction staff.

Potential operational effects

19.38. Potential effects of climate change on the development during the operation phase include:

- increased risk of flooding causing damage to buildings and other physical assets and injury to building occupiers and resort visitors;
- higher temperatures causing increased risk of internal overheating and an urban heat island effect in the public realm areas; and
- increased wind speeds causing increased risk of damage to building and other physical assets and injury to building occupiers and resort visitors.

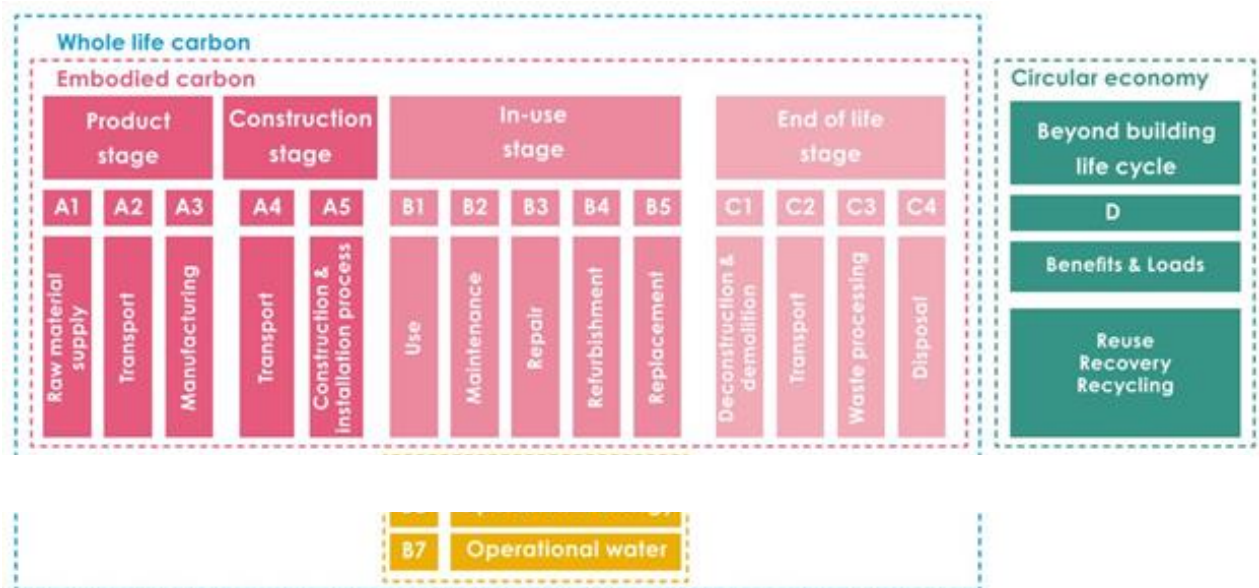
APPROACH AND METHODOLOGY

19.39. In line with industry best practice, it is proposed that the climate change chapter is split into two parts, the first focusing on climate change mitigation (i.e. a lifecycle GHG emissions assessment) and the second focusing on climate change adaptation and resilience.

19.40. There is currently no standard methodology for quantifying GHG emissions within EIA. Best practice will be drawn from the EIA Guide to Assessing GHG Emissions and Evaluating their Significance (IEMA, 2017), the RICS Whole Life Carbon Assessment for the Built Environment (2017), *BS EN 15978:2011 Sustainability of Construction Works - Assessment of Environmental Performance of Buildings - Calculation Method* and the draft *GLA Whole Life-Cycle Carbon Assessments Guidance*. An assessment period of 60 years from completion is proposed, as per the principles outlined in *BS EN 15978 Sustainability of Construction Works - Assessment of Environmental Performance of Buildings - Calculation Method*. This is based on the typical expected service life of a building.

The GHG emissions scope will align with the lifecycle stages defined as modules within *BS EN 15978 Sustainability of Construction Works - Assessment of Environmental Performance of Buildings - Calculation Method*, with building elements included as per guidance within the RICS guidance on Whole Life Carbon Assessment for the Built Environment (2017).

Figure 19.1 Diagram showing the stages of a lifecycle greenhouse gas emissions assessment. Diagram based on the lifecycle stages set out in BS EN 15978.



Construction

19.41. Construction emissions arise from the product stage and construction process stage. Emissions associated with these stages shall be estimated based on area schedules and best available benchmarks for building typologies.

Operation

19.42. GHG emissions associated with the use and end of life phases shall be estimated based on area schedules and best available benchmarks for building typologies.

19.43. Operational transport emissions shall be estimated for land and river-based transport to and from the Project Site. In order to estimate transport related emissions, emissions factors from the UK Government Greenhouse Gas Reporting: Conversion Factors 2019 shall be applied to trip generation and mode share data provided by the transport consultants. Assumptions shall be made on the likely distance of travel for users of the Proposed Development.

Climate change adaptation

19.44. Like with the assessment of GHG emissions, there is no standard methodology for assessing the effects of climate change on a development in EIA. For this assessment, the effects of climate change on the Proposed Development shall be assessed by each technical specialist within their own ES chapter. The Climate Change ES chapter shall then combine these assessments in order to provide an overall summary. Best practice shall be drawn from IEMA's *EIA Guide to Climate Resilience and Adaptation* and *BS EN ISO 14090:2019 Adaptation to Climate Change — Principles, Requirements and Guidelines*.

PROPOSED AVOIDANCE AND MITIGATION MEASURES

GHG emissions

19.45. For the construction stage, mitigation measures will focus on lean design, the selection of low embodied carbon materials and circular economy principles. In contrast to a linear 'take-make-dispose' economy, a circular economy is based on a closed loop system that designs out waste and pollution and keeps products and materials in high-value use and circulation.

19.46. For the operational stage, measures to reduce consumption in line with current Building Regulations, Local and Regional Planning Policies and best practice will be proposed. Mitigation measures shall follow the 'lean-clean-green' energy hierarchy, prioritising energy demand reduction (e.g. passive design measures) and improved systems efficiency, followed by supplying energy efficiency, and finally sourcing the remaining energy from low carbon and renewable sources.

Climate change adaptation

19.47. The effects of climate change on the Proposed Development shall be assessed by each technical specialist within their own ES chapter, which will then be more comprehensively assessed as part of this chapter. These technical specialists shall also provide avoidance and mitigation measures where appropriate. Therefore, proposed avoidance and mitigation measures are not known at this time.

UNCERTAINTIES

GHG emissions

19.48. There are uncertainties with the estimation of GHG emissions associated with a development. For the DCO application, embodied carbon will be assessed based on area schedules and best available benchmarks for building typologies. As such, there will be inaccuracies associated with the use of benchmark data, particularly due to the bespoke nature of some of the proposed buildings.

19.49. For the assessment of operational carbon, there is often an energy performance gap between the estimated energy consumption of a building and its actual consumption once complete, therefore creating uncertainty when estimating operational phase GHG emissions.

19.50. For the assessment of operational transport emissions, assumptions shall be made on the likely distance of travel for users of the Proposed Development. As it is difficult to gain an accurate picture of where Project Site users will arrive from, there will be uncertainty in the estimations provided.

19.51. The UK Government's Zero Carbon commitment will in time further reduce greenhouse gas emissions.

Climate change adaptation

19.52. The main uncertainty regarding the climate change adaptation assessment surrounds the climate change projections that the scheme is assessed against. Climate change projections (e.g. UKCP18) are presented using a set of scenarios that capture the relationships between human choices, emissions, concentrations and temperature change. Some scenarios are consistent with continued dependence on fossil fuels, while others are associated with deliberate actions to reduce GHG emissions. Therefore, climate change projections contain inherent uncertainty, reflecting the uncertainty associated with quantifying human activities (including technological change) and their influence on climate.

MATTERS TO BE SCOPED OUT**GHG emissions**

19.53. All the modules of *BS EN 15978 Sustainability of Construction Works - Assessment of Environmental Performance of Buildings - Calculation Method* have been scoped into the GHG emissions assessment.

Climate change adaptation

19.54. No particular element of the climate change adaptation and resilience assessment has been scoped out at this stage. The effects of climate change on the Proposed Development shall be assessed by each technical specialist within their own ES chapter. Therefore, based on professional judgement, technical specialists may scope out an assessment of the effects of climate change on the development if it is believed that no significant effects will arise.

Twenty ◆ Conclusion

- 20.1 LRCH intends to apply for a Development Consent Order under the Planning Act 2008 for a major Resort complex with associated landscape, road, marine and utilities infrastructure and related housing, at Swanscombe in Kent.
- 20.2 Since the Secretary of State provided an EIA scoping opinion for the project in 2014 the proposals have evolved and now include land at Tilbury in Thurrock, on the northern side of the River Thames. In advance of further statutory consultation and the submission of the DCO application, LRCH decided that an updated EIA scoping opinion should be sought.
- 20.3 The current report explains the proposed methodology for the assessment of the environmental effects that might arise from the construction and operation of the proposed development. The findings of the assessment will be reported in an ES that will accompany LRCH's DCO application.
- 20.4 Considerable environmental survey work and analysis has already been undertaken to provide the baseline data for the assessment and this work will continue in consultation with statutory bodies, the local community and other interested parties. The EIA studies and consultation feedback will continue to inform the refinement of the master plan for the London Resort, prior to the submission of the DCO application.

◆ Glossary

Access Corridor Land located between the A2(T) and the Leisure Core which will provide vehicle access to the London Resort at the Kent Project Site.

Additionality The extent to which something happens as a result of an intervention that would not have occurred in the absence of the intervention

Archaeological Interest There will be archaeological interest in a heritage asset if it holds, or potentially may hold, evidence of past human activity worthy of expert investigation at some point. Heritage assets with archaeological interest are the primary source of evidence about the substance and evolution of places, and of the people and cultures that made them.

Ambient Noise Totally encompassing noise in a given situation at a given time; it is usually composed of noise from many sources, near and far (as defined in BS 4142:2014+A1 2019).

Ancient Semi-natural Woodland (ASNW) A designation relating to formally recognised ancient woodland, i.e. an area that has been woodland continuously since at least 1600.

Annual Exceedance Probability (AEP) The Probability that a storm event will be exceeded in any given year.

Annual Population Survey Combined statistical survey of households in Great Britain by the ONS

Applicant London Resort Company Holdings (LRCH), the promoters of the Proposed Development.

Aquatic Primarily associated with lakes, rivers or streams. In the context of species, relates specifically to those living within water for at least one stage of their life.

Assemblage A group of species making up part of an ecological community within an area, e.g. all species of birds found on a site.

Associated Development Other development that has a direct relationship with the Principal Development and is required to support its construction or operation. Defined within Annex A of the Department for Communities and Local Government Guidance on associated development applications for major infrastructure projects (April 2013).

Attenuation A method to reduce a flood peak to prevent flooding, often utilising temporary storage, but increasing the duration of the flow

Authorised Development The development and associated development described in Part 1 of Schedule A of The Infrastructure Planning (Model Provisions) (England and Wales) Order 2009, which is development within the meaning of section 32 of the Planning Act 2008 (as amended).

Background Noise A-weighted sound pressure level of the residual noise at the assessment position that is exceeded for 90% of a given time interval, T, measured using the Fast time weighting and quoted to the nearest whole number of decibels (as defined in BS 4142:2014+A1 2019).

Baseline Studies Work done/used to determine and describe the landscape and visual conditions against which any future changes can be measured or predicted and assessed.

Biodiversity A term developed in the late 1980's and coming to prominence after the 1992 Rio Convention. A general term used to describe all aspects of biological diversity (including: species richness, ecosystem complexity and genetic variation).

Biodiversity Action Plan (BAP) The principle mechanism used in the UK for identifying and delivering nature conservation strategies and objectives at different spatial scales.

Birds of Conservation Concern (BoCC) (Red List, Amber List) A British Trust for Ornithology (BTO) quantitative assessment of the population status of birds in the UK. Seven criteria are used and include (amongst others):

- Red List: globally threatened; historical decline (1800-1995); Rapid ($\geq 50\%$) decline/contraction in UK breeding population/range over the last 25 years.
- Amber List: unfavourable conservation status in Europe; moderate (25-49%) decline/contraction in UK breeding population/range over the last 25 years.

Breeding Bird Assemblage Refers specifically to birds found within the site during peak breeding season of March – July and displaying breeding behaviour.

Business Register and Employment Survey Source of official ONS employee and employment statistics, used to derive employment estimates at varying industrial and geographical levels

Characterisation The process of identifying areas of similar landscape character, classifying and mapping them and describing their character.

Characteristics Elements, or combinations of elements, which make a contribution to distinctive landscape character.

Circular Economy In contrast to a linear 'take-make-dispose' economy, a circular economy is based on a closed loop system that designs out waste and pollution and keeps products and materials in high-value use and circulation.

Climate Change Climate change is the long-term alteration of temperature and typical weather patterns in a place. For the purposes of this chapter, we are referring to global climate change as a result of the release of GHGs into the atmosphere by humans.

Climate Change Adaptation Adaptation means anticipating the adverse effects of climate change and taking appropriate action to prevent or minimise the damage they can cause or taking advantage of opportunities that may arise.

Climate Change Mitigation Mitigation addresses the root causes of climate change by reducing greenhouse gas emissions.

Climate Change Resilience The capacity to which a development can absorb stresses and maintain function in the face of external stresses imposed upon it by climate change.

Clinical Commissioning Group NHS organisation set up in 2012 to organise the delivery of NHS services in England

Coastal Grazing Marsh A priority habitat found along estuaries and coastal regions, often seasonally inundated and characterised by its management (i.e. grazing).

Commuting In ecological terms this refers to travelling between a roost and a key foraging site.

Compensation Measures devised to offset or compensate for residual adverse effects which cannot be prevented/avoided or further reduced.

Conceptual Model A representation of the characteristics of the site in diagrammatic form that shows the possible relationships between contaminants, pathways and receptors.

Conservation (for heritage policy) The process of maintaining and managing change to a heritage asset in a way that sustains and, where appropriate, enhances its significance.

Construction Environmental Management Plan (CEMP) A plan to manage and monitor the construction phase of a project, in relation to potential impacts and associated control measures.

Construction Waste Waste generated during the construction phase of a development. This can include excavation and demolition waste.

Contaminant A substance that is in, on or under the land and that has the potential to cause harm or to cause pollution to controlled waters.

Ctr Spectrum adaptation term calculated using traffic noise as described in BS EN ISO 717-1:2013. This term is provided with weighted single values such as $D_{nT,w}$ or R_w to match with particular requirements (building acoustic or traffic noise spectrum).

Deadweight Outputs/outcomes that would occur at the end of the intervention life if the intervention was not implemented (the 'do nothing' scenario)

Decibel (dB) Decibel (dB) is a dimensionless unit commonly used to demonstrate sound levels. It is derived from the logarithm of the ratio between the measured level and the reference value. For sound pressure level (L_p) the reference value is 2×10^{-5} pascals. For sound power (L_w) reference value is 1×10^{-12} Watts.

Designated Heritage Assets World Heritage Sites, Scheduled Monuments, Listed Buildings, Protected Wreck Sites, Registered Park and Gardens, Registered Battlefields and Conservation Areas designated under the relevant legislation, polices and guidance.

Designated Landscapes Areas of landscape identified as being of importance at international, national or local levels, either defined by statute or identified in development plans or other documents.

Design Flood Level This is the level of flooding that flood defences or mitigation measures are designed against. This is typically the 1% (1 in 100) flood level.

Desk Study In relation to ecology - A search for records of historical data relating to habitats and species within a given search area. In relation to ground conditions - Interpretation of historical, archival and current information to establish where previous activities were located, and where areas or zones that contain distinct and different types of contamination may be expected to occur, and to understand the environmental setting of the site in terms of pathways and receptors.

Development Any proposal that results in a change to the landscape and/or visual environment.

Development Consent Order A statutory instrument that combines planning permission and other relevant consents for National Significant Infrastructure Projects under the Planning Act 2008 (as amended).

Development Consent Order Limit The limits shown on the works plan within which the authorized project may be carried out.

Development Consent Order Requirement Similar to a planning condition and required in order for the Proposed Development to be acceptable.

Direct Effect An effect that is directly attributable to the proposed development.

Discharge The rate of flow of water measured in terms of volume per unit time

Displacement Proportion of intervention outputs/outcomes accounted for by reduced outputs/outcomes elsewhere in the target area

`Do nothing` Situation Continued change or evolution in the landscape in the absence of the proposed development.

Early Successional Vegetation colonising bare or abandoned land.

Ecological Clerk of Works (ECoW) A suitably qualified ecologist appointed to supervise construction works and ensure the appropriate delivery of specified ecological mitigation.

Ecological Impact Assessment (EclA) The portion of the EIA specifically relating to ecological matters, undertaken with reference to standardised methodology published by the professional body for ecologists, the Chartered Institute of Ecology and Environmental Management (CIEEM).

Ecological Management and Monitoring Plan (EMP) A long-term, post-construction, management plan for the protection and conservation of ecological features of interest within the context of the new development.

Ecological Watching Brief The process of on-site supervision, by a suitably qualified ecologist, to ensure that the activities identified within the CEMP and/or EMP are undertaken to the appropriate standard.

Effects A predicted change in environmental baseline as a result of the proposed development. Effects can be positive or negative.

Effect – Receptor Pathway Pathway (e.g. hydrological, direct or airborne) enabling positive or negative effects upon IEFs.

Elements Individual parts which make up the landscape, such as, for example, trees, hedges and buildings.

Embodied Emissions Embodied emissions are the total GHG emissions generated to produce a built asset. This includes emissions caused by extraction, manufacture/processing, transportation and assembly of every product and element in an asset.

Enhancement Proposals that seek to improve the landscape resource and the visual amenity of the proposed development site and its wider setting, over and above its baseline condition.

Environmental Statement (ES) A document that describes the impacts of the Proposed Development on the environment. It is prepared in accordance with the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017.

Essex Project Site The area of the Project Site contained within the redline that lies in Essex (north of the River Thames).

Extended Phase 1 Habitat Survey A habitat survey designed to map out broad habitat types and to identify any possible protected species issues in order to enable further survey.

Field Pattern The pattern of hedges and walls that define fields in a farmed landscape (LI / IEMA 2002).

Flood Defence A natural or man-made infrastructure used to prevent certain areas from inundation from flooding, and / or the provision of flood warning systems

Floodplain Area of land adjacent to a water course which water flows or is stored during a flood event, or would otherwise be flooded in the absence of flood defences

Flood Resilience Improving flood resistance, e.g. reducing the risk of properties against flooding events

Flood Risk The level of risk to personal safety and damage to property resulting from flooding due to the frequency or likelihood of flood events

Flood Risk Assessment (FRA) An assessment of the flood risks to the proposed development over its expected lifetime and the possible flood risks to the surrounding areas, assessing flood flows, flood storage capacity and runoff

Flood Warning Systems (FWS) A system by which to warn the public of the potential of imminent flooding. This is typically linked to a flood forecasting system

Fluvial Flooding Related or connected to a watercourse (river or stream)

Forb A flowering plant species not including grasses, sedges, rushes or woody vegetation.

Frequency In relation to noise, number of cycles per second, measured in hertz (Hz), related to sound pitch.

Grassland A habitat dominated by grasses.

Greenhouse Gas (GHG) Emissions The release of GHGs into the atmosphere, thereby causing global climate change. According to the Kyoto Protocol, the major GHGs released by humans are carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulphur hexafluoride (SF₆).

Gross direct employment Employment supported within the redline

Groundwater Water present within underground strata known as aquifers

Groundwater Flooding Water occurring below ground in natural formations (typically rocks, gravels and sands)

Feature Particularly prominent or eye-catching elements in the landscape, such as tree clumps, church towers or wooded skylines OR a particular aspect of the project proposal.

Field/baseline surveys A series of nationally recognised methodologies for gathering current data in relation to specific habitats or species.

Full-time equivalent (FTE) A unit that indicates the workload of an employed person to make workloads comparable

Habitat A community of plant species interacting with the physical characteristics of an area which is identifiable as a specific type, i.e. grassland.

Habitat Regulations Assessment (HRA) An assessment of a site's effects upon designated European sites under the Conservation of Habitats and Species Regulations 2017, undertaken by the competent authority.

Habitat Suitability Index (HSI) A measure of habitat suitability for great crested newts.

Hazard A property or situation that in particular circumstances could lead to harm or pollution.

Heritage Asset A building monument, site, place, area or landscape identified as having a degree of significance meriting consideration in planning decisions, because of its heritage interest. Heritage assets include designated heritage assets and assets identified by the local planning authority (including local listing) or through professional assessment.

Historic Environment All aspects of the environment resulting from the interaction between people and places through time, including all surviving physical remains of past human activity, whether visible, buried or submerged, and landscaped and planted or managed flora.

Historic Environment Record (HER) Information services that seek to provide access to comprehensive and dynamic resources relating to the historic environment of a defined geographic area for public benefit and use.

Historic Landscape Characterisation (HLC) The identification and interpretation of the historic dimension of the present-day landscape or townscape within a given area.

Homogeneity A term used to describe the uniform nature of quality and structure.

IEF Important ecological features. Those features (habitats or species) deemed to be of local level value or higher.

Immediate Impact Area small geographical area containing the site, used in relation to employment statistics

Impermeable Surface A surface that does not permit the infiltration of water and, therefore, generates surface water runoff during periods of rainfall

Indirect Effects Effects that result indirectly from the proposed project as a consequence of the direct effects, often occurring away from the site, or as a result of a sequence of interrelationships or a complex pathway. They may be separated by distance or in time from the source of the effects.

Indirect employment Employment supported outside of the redline as a result of multiplier impacts

Institute of Environmental Management and Assessment (IEMA) IEMA is the professional body for people working in environment and sustainability. They provide resources and tools, research and knowledge sharing and formal training and qualifications.

Intertidal Relating to the area that is submerged at high tide and exposed at low tide.

Intervisibility Two points on the ground or two features are described as intervisible when visible from each other

Kent Project Site The area of the Project Site contained within the redline that lies in Kent (south of the River Thames).

Key Characteristics Those combinations of elements which are particularly important to the current character of the landscape and help to give an area its particularly distinctive sense of place.

L_{A10} A-weighted sound pressure level exceeded for 10% of a specified period of time i.e. a level which would be perceived as a higher portion of the levels at any particular time. Typically determined by local traffic pass-bys or transient events. What you would hear when a number of road traffic vehicles pull away from traffic lights, for example.

L_{90,T} (L_{A90,T}) Sound pressure level exceeded for 90% of the measurement period. Referred to as background noise level.

L_{Ar,T} Rating Noise Level (as defined in BS 4142:2014+A12019), the specific noise level plus any adjustment for the characteristic features of the noise.

L_{eq,T} (L_{Aeq,T}) The equivalent continuous noise level of a time-varying noise. It is the steady noise level which, over the period of time under consideration, contains the same amount of sound energy as the time-varying noise over the same period of time.

L_{Fmax,T} (L_{AFmax,T}) The maximum sound pressure level (L) measured during the measurement period T using the fast time constant.

L_p Sound pressure level, in decibels, of a sound is 20 times the logarithm to the base of 10 of the ratio of the sound pressure to the reference pressure (2×10^{-5} pascals). The reference pressure shall be explicitly stated and is defined by standard.

Land Cover The surface cover of the land, usually expressed in terms of vegetation cover or lack of it. Related to but not the same as land use.

Landfill An area of land that is used to dispose waste, either on the ground (land raising) or filling a hole in the ground (landfilling). This type of disposal is for material which cannot be reused, recycled, or otherwise treated.

Land Use What land is used for, based on broad categories of functional land cover, such as urban and industrial use and the different types of agriculture and forestry.

Landform The shape and form of the land surface which has resulted from combinations of geology, geomorphology, slope, elevation and physical processes.

Landscape Landscape results from the way that different aspects of our environment (physical, social, aesthetic and perceptual) interact together and are perceived by us:

- Physical elements – e.g. geology, landform, soils, flora and fauna
- Social elements – e.g. land use, enclosure patterns, and the patterns, form and scale of settlements and other built development
- Aesthetic factors – e.g. colour, form, visual texture and pattern, sounds, smells and touch; and
- Perceptual factors – e.g. memories, associations, stimuli and preferences.

Landscape and Visual Impact Assessment (LVIA) A tool used to identify and assess the likely significance of the effects change resulting from development, both on the landscape as an environmental resource in its own right and on people's views and visual amenity.

Landscape Capacity The degree to which a particular landscape character type or area is able to accommodate change without significant effects on its character. Capacity is likely to vary according to the type and nature of change being proposed.

Landscape Character A distinct, recognisable and consistent pattern of elements in the landscape that makes one different from another, rather than better or worse.

Landscape Character Areas (LCAs) These are single unique areas which are the discrete geographical areas of a particular landscape type.

Landscape Character Assessment (LCA) The process of identifying and describing variation in the character of the landscape, and using this information to assist in managing change in the landscape. It seeks to identify and explain the unique combination of elements and features that make landscapes distinctive. The process results in the production of a Landscape Character Assessment.

Landscape Character Types (LCTs) These are distinct types of landscape that are relatively homogeneous in character. They are generic in nature in that they may occur in different areas in different parts of the country, but wherever they occur they share broadly similar combinations of geology, topography, drainage patterns, vegetation and historical land use and settlement pattern, and perceptual and aesthetic attributes.

Landscape Elements A physical component (both natural and manmade) of the landscape.

Landscape Effects Effects on the landscape as a resource in its own right.

Landscape Fabric The elements and features that constitute the physical components of the landscape, including vegetation, hedgerows, trees, shrubs, walls, fences and vernacular structures.

Landscape Quality/Condition A measure of the physical state of the landscape. It may include the extent to which typical character is presented in individual areas, the intactness of the landscape and the condition of the individual elements.

Landscape Receptors Defined aspects of the landscape resource that have the potential to be affected by a proposal.

Landscape Strategy The overall vision and objectives for what the landscape should be like in the future, and what is thought to be desirable for a particular landscape type or areas as a whole, usually expressed in formally adopted plans and programmes or related documents.

Landscape Units An umbrella term for landscape character areas and landscape character types.

Landscape Value The relative value that is attached to different landscapes by society. A landscape may be valued by different stakeholders for a whole variety of reasons.

Leakage Proportion of outputs that benefit those outside of the intervention's target area of group

Loafing Bird behaviour not connected with feeding or breeding, encompassing activities such as preening and resting.

Local Nature Reserve (LNR) A nature reserve designated for both wildlife and educational access under Local Authority powers.

London Resort Company Holdings / LRCH The company promoting the Proposed Development.

Lower Super Output Area A geographical area to report small area statistics as defined by ONS classification

Local Wildlife Site (LWS) A site with substantive nature conservation value designated at the local level.

Magnitude of Effect A term that combines judgements about the size and scale of the effect, the extent of the area over which it occurs, whether it is reversible or irreversible and whether it is short or long term in duration.

Marshy Grassland Wet grassland, often in depressions or at the bottoms of valleys, characterised by the presence of species tolerant of wet conditions, such as rushes and sedges.

Medium Super Output Area A geographical area to report medium area statistics as defined by ONS classification

Mitigation The term used to describe actions or approaches to minimising potential adverse effects on species or habitats, as the result of the construction or operation of a proposed scheme. Mitigation may include:

- reduction/minimisation - types of mitigation resulting from changes in scheme design to reduce or removal potential adverse effects.
- amelioration - types of mitigation that may include, for example, methods of working to reduce or remove potential adverse effects.
- relocation/translocation - types of mitigation requiring the removal and re-establishment of a habitat or species away from an area affected by development. Such activities may, or may not require Natural England consent, depending on species or habitat type, but where a licence is not required, the work is most usually undertaken using a Method Statement agreed with Natural England.

Modular Design A design approach that creates things out of independent parts with standard interfaces. This allows designs to be customized, upgraded, repaired and for parts to be reused.

Multiplier effects further economic activity (jobs, expenditure or income) associated with additional local income, visitor expenditure and local supplier purchases.

National Nature Reserve (NNR) A statutory reserve designated by Natural England containing an area which is among the best examples of a particular habitat and is of national importance.

National Vegetation Classification (NVC) A nationally recognised standard for surveys, categorising and evaluating vegetation communities and habitats.

Natura 2000 A network of nature protection areas in the territory of the European Union and the UK. It is made up of Special Areas of Conservation and Special Protection Areas designated respectively under the Habitats Directive and Birds Directive.

Natural England (NE) The statutory body for nature in the UK, an executive non-departmental public body, sponsored by the Department for Environment, Food & Rural Affairs. Provides advice to the government on nature conservation and protected species and regulates licencing.

Nature Conservation The maintenance of environmental quality (particularly in relation to habitats and species). The term implies sound [nature conservation] management within given social and economic constraints.

NERC s41 Natural Environment and Rural Communities Act 2006. Species and habitats “of principal importance for the purpose of conserving biodiversity” are covered under section 41 (England) of the NERC Act (2006) and therefore need to be taken into consideration by a public body when performing any of its functions with a view to conserving biodiversity.

Net employment the employment impact taking into account displacement.

Nocturnal species Refers to animals that are active at night.

Noise Sensitive Receptors (NSR) Receptors which are potentially sensitive to noise and vibration. Examples include dwellings, hospitals, schools, community facilities, designated areas (e.g. Areas of Outstanding Natural Beauty), and public rights of way

Notable Species Species not legally protected but notable for conservation value and may feature in local plan policies.

Off-site Fabrication The completion of elements or components of a construction project at a different location to where they will be permanently installed.

Operational Emissions Operational emissions are the total GHG emissions generated when heating, cooling, lighting and running a built asset.

Operational Waste Waste generated when the site is in operation, and construction is complete.

Opportunity Area Area defined by a local authority/remit with potential for growth

Permeability The measures of ease with which a fluid can flow through a porous medium.

Phase I Habitat Survey A method for auditing a geographical area to identify habitats or species of nature conservation interest, or their potential presence. Principally used for scoping further, more detailed, ecological surveys.

Perception Combines the sensory (that we receive through our senses) with the cognitive (our knowledge and understanding gained from many sources and experiences).

Photomontage A visualisation which superimposes an image of a proposed development upon a photograph or series of photographs.

PM₁₀ Particulate matter with an aerodynamic diameter of under ten microns.

PM_{2.5} Particulate matter with an aerodynamic diameter of under two and a half microns

Preliminary Risk Assessment First tier of risk assessment that develops the initial conceptual model of the site and establishes whether there are any potentially unacceptable risks.

Principal Development All works proposed within the ticketed part of the London Resort, referred to as the 'Leisure Core'.

Priority Habitats Habitats covered under section 41 (England) of the NERC Act (2006). Priority habitats cover a wide range of semi-natural habitat types identified as being the most threatened and requiring conservation action.

Priority Species Species covered under section 41 (England) of the NERC Act (2006).

Project Site The area of land defined by the DCO Order Limit and subject to the DCO application under the Planning Act 2008 (as amended), this consists of the land contained within the Kent Project Site and the Essex Project Site.

Proposed Development The London Resort. The Proposed Development subject to the DCO application under the Planning Act 2008 (as amended).

Protected Species Species with legal protection.

Public Access

- Definitive rights of way – public footpaths, bridleways, cycle routes, Byways Open to All Traffic (BOATS) and highways. Shown on Definitive Rights of Way maps held by the Local Authority;
- Permissive paths and bridleways – routes where there is public access with the permission of the landowner. Such routes are usually closed at least one day a year to prevent establishment of a public right of way;
- Public open space – areas designated for specified public uses, usually in the ownership of the Local Authority. Includes parks and recreation grounds. Shown on Local Development Plans;
- Beaches – the public have permitted access to much of the foreshore (intertidal zone – between high and low tide marks) owned by the Crown Estate, and on land above high water mark owned by the Local Authority. Some beaches above high tide mark are privately owned and some beaches and foreshore have restricted access for military purposes;
- Access land – land where public access is currently permitted with the permission of landowners. Includes land outlined in purple on the OS Explorer (1:25,000) sheets and with:
 - No symbol – land open to public with permission of owners;
 - White oak leaf in purple box – National Trust, always open;
 - Purple oak leaf in white box – National Trust limited access;
 - Tree symbols in purple box – Forestry Commission;
 - Single leaf in purple box – Woodland Trust; and

- White “AL” in purple box – other access land.
- Open access land – areas of mountains, moor, heath, down, common land and coastal foreshore that have been designated under Section 2 of the Countryside and Rights of Way Act 2000. The right of access is for walkers only and does not extend to cycling, horse riding or driving a vehicle, nor does the right of access apply to developed land, gardens or cultivated land. Under the CRoW Act 2000, there was a process of consultation that allowed the right of appeal for those with a legal interest in the land, and for sensitive ecological or archaeological sites to be excluded. Conclusive maps showing the areas designated as open access land (Registered Common Land and Open Country) are now available from Natural England (in England) and the Countryside Council for Wales (in Wales).

Ramsar site Wetlands of international importance, designated under the Ramsar Convention. Wetlands are defined as areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six metres.

Reach Character Areas (RCAs) Single unique areas that are discrete geographical areas of riverscape.

Recycling The process of manufacturing new materials and objects from waste materials.

Red Listed Bird species listed under the red list of Birds of Conservation Concern in the UK (Eaton MA, Aebischer NJ, Brown AF, Hearn RD, Lock L, Musgrove AJ, Noble DG, Stroud DA and Gregory RD (2015) Birds of Conservation Concern 4: the population status of birds in the United Kingdom, Channel Islands and Isle of Man. British Birds 108, 708–746)

Reedbed A wetland habitat dominated by common reed (*Phragmites australis*)

Relocation The movement of species or habitats to areas within the development site that will not be affected by construction or operation activities.

Remediation Action taken to prevent or minimise, or remedy or mitigate the effects of any unacceptable risks.

Resilience Improving the flood resistance, e.g. Buildings

Return Period The average frequency of a specified condition. An ‘n’ year event is one that occurs on average over the long term, once every ‘n’ years

Reuse The action or practice of using an item or material multiple times for the original purpose or to fulfil a different purpose.

Riparian Relating to rivers and their immediate surroundings

Riverscapes Landscape with views of a river and adjacent land with cultural, historical and archaeological links with each other.

Roosting Residing within a structure or tree (bats) or elsewhere.

Royal Institution of Chartered Surveyors (RICS) RICS is a professional body for the valuation, management and development of land, real estate, construction and infrastructure.

Runoff Water flow over surfaces to the drainage system. Runoff occurs if the ground is impermeable or if permeable ground is saturated.

Saltmarsh A coastal habitat characterised by halophytic (salt tolerant) plants, generally inundated semi-regularly.

Schedule 1 Bird species listed under Schedule 1 of the Wildlife and Countryside Act (1981 as amended), afforded additional protection from disturbance whilst nesting.

Scheduled Monument A monument of national importance given legal protection under the Ancient Monuments and Archaeological Areas Act 1979.

Scoping Report. EIA Scoping Report submitted to the Secretary of State as required by the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 to determine the extent of environmental issues to be considered in the Environmental Statement.

Scoping Opinion. EIA Scoping Opinion provided by the Secretary of State in accordance with the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 confirming the information that should be provided in the ES.

Seascapes Landscape with views of the coast or seas, and coasts and adjacent marine environments with cultural, historical and archaeological links with each other.

Sensitivity A term applied to specific receptors, combining judgements of the susceptibility of the receptor to the specific type of change or development proposed and the value related to that receptor.

Setting of a Heritage Asset The surroundings in which a heritage asset is experienced. Its extent is not fixed and may change as the asset and its surroundings evolve. Elements of a setting may make a positive or negative contribution to the significance of an asset, may affect the ability to appreciate that significance or may be neutral.

Significance A measure of the importance or gravity of the landscape and visual effect, defined by specific significance criteria.

Significance (for heritage policy) The value of a heritage asset to this and future generations because of its heritage interest. That interest may be archaeological,

architectural, artistic or historic. Significance derives not only from a heritage asset's physical presence, but also from its setting.

Single Event Level (SEL (L_{AE})) The sound level over one second which would have the same energy content as the whole event.

Site Investigation Intrusive investigation of a site, designed to facilitate hazard assessment and conducted prior to detailed assessments required for risk estimation.

Site of Nature Conservation Importance (SNCI) A non-statutorily designated local wildlife site

Site of Special Scientific Interest (SSSI) Sites that support a range of habitats and/or species considered to be of national nature conservation interest designated and protected under the WCA 1981.

Special Areas of Conservation (SAC) An area which has been given special protection under the European Union's Habitats Directive. SACs provide increased protection to a variety of wild animals, plants and habitats and are a vital part of global efforts to conserve the world's biodiversity.

Special Protection Area (SPA) An area of land, water or sea which has been identified as being of international importance for the breeding, feeding, wintering or the migration of rare and vulnerable species of birds found within the European Union.

Species-rich Grassland Grassland notable for the number of non-grass (forb) species present.

Specific Noise Level The equivalent continuous A-weighted sound pressure level at the assessment position produced by the specific noise source over a given reference time interval (as defined in BS 4142:2014+A1 2019).

Stakeholders The whole constituency of individuals and groups who have an interest in a subject or place.

Strategic Flood Risk Assessment (SFRA) An SFRA is the assessment and 'categorisation' of flood risk on an area-wide basis in accordance with PPS25

Study Area Usually taken to mean the extent of the Desk Study search.

Super Output Area A geography for the collection and reporting of small area statistics. They are used on the Neighbourhood Statistics Site and across National Statistics.

Surface Water Flooding Surface water flooding occurs when the volume of water is unable to filtrate through the ground to enter drainage systems, and therefore runs quickly off land and results in localised flooding. This type of flooding is usually associated with intense rainfall.

Survey Area The geographical extent of a particular field survey.

Susceptibility The ability of a defined landscape or visual receptor to accommodate the specific proposed development without undue negative consequences.

Sustainable Drainage Systems (SuDS) SuDS are used as a strategy to manage surface water in a sustainable manner or least damaging solution through management practices and physical structures.

Sward A term used to describe the collective assemblage of plants within a given area of grassland.

Swanscombe Marshes An alternative name for Black Duck Marsh.

Target Note (TN) Notations of specific features of interest recorded during a Phase I Habitat Survey

Terrestrial To do with the land.

Thermophilic Warmth loving species

Time Depth Historical layering; the idea of landscape as a `palimpsest`, a much written-over manuscript.

Toolbox Talk An informal talk to inform contractor or site workers on the protected species and habitat interests of a site.

Tranquillity A state of calm and quietude associated with peace, considered to be a significant asset of landscape.

Transect A linear survey route particularly useful for detecting transitions or distribution patterns.

Translocation The movement of species or habitats to a wholly new (receptor) site.

Townscape The character and composition of the built environment including the buildings and the relationships between them, the different types of urban open space, including green spaces, and the relationship between buildings and open spaces.

Townscape Character Areas (TCAs) Single unique areas that are discrete geographical areas of townscape.

Urban Development Corporation An organisation started by government to improve and develop a specific inner city area, in this case refers to Ebbsfleet Garden City.

Value An aspect of worth or importance

Verification Report Provides a complete record of all remediation activities on site.

Vibration Force which oscillates about some specified reference point. Vibration is commonly expressed in terms of frequency such as cycles per second (cps), Hertz (Hz), cycles per minute (cpm) or (rpm) and strokes per minute (spm). This is the number of oscillations which occurs in that time period. The amplitude is the magnitude or distance of travel of the force.

Viewing Distance That distance that a viewpoint illustration should be held from the eye in order for the illustration to match the scale of the actual view when used in the field to identify the location and scale of the proposed development.

Visibility Visibility is a measure of the distance that can be seen by the human eye at any one time. Daylight visibility will depend on several factors, including:

- Atmospheric transparency (governed by the solid and liquid particles held in suspension in the atmosphere);
- Degree of contrast between an object and the background against which it is deferred;
- Position of the sun; and,
- Observer's visual acuity.

Visual Amenity The overall pleasantness of the views people enjoy of their surroundings, which provides an attractive visual setting or backdrop for the enjoyment of activities of the people living, working, recreating, visiting or travelling through an area.

Visual Effects Effects on specific views and on the general visual amenity experienced by people.

Visual Receptors Individual and/or defined groups of people who have the potential to be affected by a proposal.

Visualisation A computer simulation, photomontage or other technique illustrating the predicted appearance of a development.

Waste to Energy Disposal of waste by controlled incineration. In the process energy is recovered to create power and heat. This type of disposal is for material which cannot be reused, recycled, or otherwise treated.

Weightings In relation to noise and (as defined in BS EN 61672:2013). A-Weighting: Frequency weighting devised to attempt to take into account the fact that human response to sound is not equally sensitive to all frequencies; it consists of an electronic filter in a sound level meter, which attempts to build in this variability into the indicated noise level reading so that it will correlate, approximately, with human response.). C-Weighting: One of the frequency weightings corresponding to the 100-phon contour and the closest to the linear or un-weighted value.

Wetland Any habitat at the interface between land and water, including swamp, marsh, etc.

Wintering Bird Assemblage A group of species of birds present within and reliant upon a site during winter.

Zone of Theoretical Visibility (ZTV) / Zone of Visual Influence (ZVI) A map, usually digitally produced, showing areas of land within which a development is theoretically visible.

Palaeolithic	900,000 – 9500 BC
Early Post-glacial	9500 – 8500 BC
Mesolithic	8500 – 4000 BC
Neolithic	4000 – 2200 BC
Bronze Age	2200 – 700 BC
Iron Age	700 BC – AD 43
Romano-British	AD 43 – 410
Saxon	AD 410 – 1066
Medieval	1066 – 1500
Post-medieval	1500 – 1800
19th century	1800 – 1899
Modern	1900 – present day