



RiverOak Strategic Partners

5.2- 3

**Environmental Statement
Volume 3: Main Text –
Chapters 17 – 18**

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Project Name:

Manston Airport Development Consent Order

Regulation:

Regulation 5(2)(a) of the Infrastructure Planning
(Applications: Prescribed Forms and Procedure)
Regulations 2009, as amended

Date:

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17. Major Accidents and Disasters

17.1 Introduction

- 17.1.1 As a result of the introduction of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 2017 EIA Regulations), it is now a requirement that major accidents and disasters relevant to a development are included in the preparation of an Environmental Statement (ES). As set out in Regulation 5(4):

“The significant effects to be identified, described and assessed under paragraph (2) include, where relevant, the expected significant effects arising from the vulnerability of the Proposed Development to major accidents or disasters that are relevant to that development.”

- 17.1.2 With regards to information for inclusion in the ES, paragraph 8 of Schedule 4 to the 2017 EIA Regulations states:

“A description of the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents and/or disasters which are relevant to the project [...]. Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies.”

- 17.1.3 Previously, major accidents and disasters were primarily considered as part of the design process. However, the European Union revised the *EIA Directive (2014/52/EU)* to ensure that these factors are a material consideration in decisions to grant consent for developments requiring an Environmental Impact Assessment (EIA), and prior to the elements being further considered as part of the later design stage processes.
- 17.1.4 This Chapter sets out the approach and findings for an assessment of major accidents and disasters, on and as a result of, the Proposed Development. This Chapter should be read in conjunction with the scheme description (**Chapter 3: Description of the Proposed Development**).
- 17.1.5 This Chapter outlines the relevant policy, legislation and guidance that has informed the assessment, a summary of assessments that support this ES, the data gathering methodology and context of the overall baseline conditions. The baseline conditions, assessment scope and methodology for the assessment of the likely significant effects of the development is then presented. The Chapter concludes with a summary of incorporated measures and the results of the assessment.

Definitions

- 17.1.6 Key definitions for terms used in the assessment of major accidents and disasters in the context of an ES are summarised below. These definitions have been determined through expert review of a combination of informed opinions from the Control of Major Accident Hazards Regulations 2015 (COMAH) and other major accidents sources referenced throughout this Chapter.
- 17.1.7 **Major accident** – An occurrence resulting from an uncontrolled event caused by a man-made activity or asset leading to serious damage to receptors, either immediate or delayed. This either arises from (directly or indirectly), or has potential to impact upon, the development.
- 17.1.8 *Examples:* A major accident at a third-party establishment which gives rise to significant injury at the airport, for instance an aircraft crash, fire in a terminal, discharge of contaminated firewater or de-icer.
- 17.1.9 **Disasters** – A natural occurrence which has serious damage to receptors, either immediate or delayed, on or in the vicinity of the Proposed Development.

- 17.1.10 *Examples:* Hurricane, landslide, subsidence, extreme seismic activity, flooding.
- 17.1.11 **Serious damage on human populations** – This is harm which would be considered substantial i.e. death(s), multiple serious injuries or a substantial number of people requiring medical treatment.
- 17.1.12 Note: Occupational risks resulting from day to day activities which may affect 1 to 2 people (e.g. slips, trips and falls) and which are managed under the general obligations of the Health and Safety at Work Act are not generally recognised as a major accident. These are therefore excluded from the assessment.
- 17.1.13 **Serious damage on the environment** – Loss or significant detriment to populations of species or organisms, valued sites (including designated sites), valued cultural heritage sites, with lower thresholds for high-value or protected species/sites, contamination of drinking water supplies, ground or groundwater, or harm to environmental receptors in line with other UK Major Accident regulations measures of harm.
- 17.1.1 Note: Guidance provided by the European Commission (EC)¹ highlights that the context for inclusion of major accidents and disasters in the EIA is to ensure that adequate focus is given to the provisions for events leading to significant risk with an objective of building resilience in a development against such effects. The bar for what is tolerable to society is therefore set higher for major accidents and disasters than for a different type of event of much lower magnitude e.g. a small operational spillage or emission.
- 17.1.2 For major accidents and disasters, it is very important to recognise that the magnitude levels applied in this Chapter relate to a level of harm and damage starting at the highest level of consequence addressed in other topic chapters. The likelihood with which such an event is tolerable is relative to this scale of magnitude and therefore in general the events are much less likely than those covered in other chapters.

17.2 Policy and Legislative context

- 17.2.1 A study of planning policy, legislation and guidance at the national, regional and local level has been undertaken in relation to major accidents and disasters for the Proposed Development. Specific consideration has been given to the Proposed Development's location and proximity to certain receptors.
- 17.2.2 Full details of all national, regional and local planning policies relevant to the Proposed Development can be found in **Appendix 4.1**. The following section outlines policy and legislation relevant to this Chapter.

Policy and Legislative requirements

- 17.2.3 The importance of effective risk management for major accidents and disasters of relevance to the Proposed Development, and their impact on environmental receptors is recognised in legislation.
- 17.2.4 Legislation specific to other chapter topics is addressed in the relevant topic chapter and is not repeated here.
- 17.2.5 Key aspects of policies and legislation relevant to this appraisal are set out in **Table 17-1**.
- 17.2.6 For completeness, the Control of Major Accident Hazards (COMAH) 2015 has been included in **Table 17-1**; however, based on current understanding and information in relation to the Proposed Development, it is considered that the quantities of hazardous substances anticipated will be too low for COMAH 2015 to be engaged.

Table 17-1 Legislation, National, Regional and Local Planning Policies relevant to major accidents and disasters

Legislation or Policy reference	Legislation Summary or Policy Information Relevant to major accidents and disasters
Legislation:	
The Infrastructure Planning EIA Regulations 2017	Provides the legislative requirements for EIA in England, including the new requirement to consider major accidents and disasters.
2014/52/EU Directive on the Assessment of the Effects of Certain Public and Private Projects on the Environment	<p>Directive upon which the 2017 EIA Regulations are based.</p> <p>'A Community Approach on the Prevention of Natural and Man-made Disasters', 2009 (Para 14 of the Directive) is referred to in the Directive (2014/52/EU), in which 'man-made disasters' and 'natural disasters' are addressed, but no reference is made to 'major accident'. The Directive itself refers to 'disasters/natural disasters' (interchangeably) but no reference is made to 'man-made disasters'. It is the interpretation of this assessment that the Directive is intended to be consistent with the Community Approach document. The term 'disasters' is therefore used in the assessment to refer to 'natural disasters', and the term 'major accident' to 'man-made disasters'.</p>
Health and Safety at Work Act 1974	<p>Overarching act for safety to workers and the public by employers. Obligation to prevent intolerable risk and reduce residual risk 'So Far As Is Reasonably Practicable' (Part 1 of the Act). The concept of risk management in the UK and its application to major hazards, is to:</p> <ul style="list-style-type: none"> ▶ Remove intolerable risk; and ▶ Reduce other effects 'So Far As Is Reasonably Practicable'. <p>The term 'So Far As Is Reasonably Practicable' is in practice interchangeable with 'As Low As Reasonably Practicable' (ALARP)² for application to this assessment.</p>
Management of Health and Safety at Work Regulations 1999	These Regulations include a specific requirement that risks to people are suitably and sufficiently assessed. Though not explicit in the regulations, implicitly this includes any associated with major accidents and disasters.
Control of Major Accident Hazards Regulations 2015	<p>Covers operational sites which involve a large quantity of hazardous substances. For COMAH 2015 to apply, threshold quantities of hazardous substances (in aggregate) must be met or exceeded. Sites to which COMAH applies have specific obligations for the management of major accidents and disasters (environmental and safety risk). A level of demonstration is also required which is proportionate to the level of risk posed by the establishment, and the quantity of hazardous materials involved.</p> <p>The general obligations are consistent with those of the Management of Health and Safety at Work Regulations.</p>
Pipeline Safety Regulations 1996	The Regulations are for the safe design and operation of pipelines. Additional requirements (Part III of the Regulations) exist for emergency planning and regulatory notification for conveyance of hazardous fluids.
National Planning Policy:	
Airports National Policy Statement (NPS): New Runway Capacity and Infrastructure at Airports in the South East of England 2018	<p>This includes reference to a number of factors which may influence the cause, severity or likelihood of major accidents and disasters (e.g. climate change, flood risk, good infrastructure design, pollution control, security, land instability), as well as references to EIA topics, and supporting studies.</p> <p>See also Chapter 7: Biodiversity See also Chapter 8: Freshwater Environment See also Chapter 15: Human Health</p>
National Planning Policy Framework (NPPF) (2012)	
Paragraph 164	Identifies that local planning authorities should work with local advisors and others to ensure that they have, and take into account, up to date information on higher risk sites in their area for malicious threats and natural hazards, including steps that can be taken to reduce vulnerability and increase resilience.

Legislation or Policy reference	Legislation Summary or Policy Information Relevant to major accidents and disasters
Paragraph 172	<p>Identifies that local planning policies should be based on up-to-date information on the location of major hazards and on the mitigation of the consequences of major accidents.</p> <p>For the purposes of the planning policy, 'major hazards' is defined in the specific context of major hazard installations and pipelines, licensed explosive sites and nuclear installations, around which Health and Safety Executive (and Office for Nuclear Regulation) consultation distances to mitigate the consequences to public safety of major accidents may apply.</p> <p>Note: The term 'major accidents' in the 2017 EIA Regulations applies to all developments for which an EIA is required, and is not limited to only designated major hazard (e.g. COMAH) installations and pipelines, licensed explosive sites and nuclear installations.</p>
Paragraph 194	<p>Identifies that local planning authorities should consult appropriate bodies when planning or determining applications for development around major hazards.</p> <p>See above referenced Para 172 of NPPF for context of major hazards as applied to planning policy.</p>
National Planning Policy Framework (NPPF): Draft for Consultation (March 2018)	
Paragraph 46	Local planning authorities should consult the appropriate bodies when considering applications for the siting or changes to hazardous substances establishments, or for development around such establishments.
Paragraph 96	<p>Planning policies and decisions should promote public safety and take into account wider security and defence requirements by:</p> <ul style="list-style-type: none"> a) Anticipating and addressing all plausible malicious threats and natural hazards, especially in locations where large numbers of people are expected to congregate. Local policies for relevant areas (such as town centres and regeneration frameworks), and the layout and design of developments, should be informed by the most up-to-date information available from the police and other agencies about the nature of potential threats and their implications. This includes appropriate and proportionate steps that can be taken to reduce vulnerability, increase resilience and ensure public safety and security; and b) Recognising and supporting development required for operational defence and security purposes, and ensuring that operational sites are not affected adversely by the impact of other development proposed in the area.
Paragraph 194	Identifies that local planning authorities should consult appropriate bodies when planning or determining applications for developments around major hazards.
Thanet District Adopted Local Plan (2006) Saved Policies	Identifies the requirement for proposals to demonstrate that new developments cannot contaminate groundwater sources and/or that appropriate mitigation measures will be incorporated into the development to prevent contamination.
Policy EC2 – Kent International Airport	
Policy EP 13 – Groundwater Protection Zones	A development located within groundwater Source Protection Zones (SPZ), if identified to have the potential to result in a risk of contamination of groundwater sources, will not be permitted without adequate mitigation measures to prevent such contamination taking place.

Guidance

- 17.2.7 Since the requirement for this topic in EIA was established only in 2017, specific guidance on the assessment of major accidents and disasters specific to the 2017 EIA Regulations has yet to be produced.
- 17.2.8 Existing guidance for the general topic of major accidents and disasters assessment has been developed for other regulatory purposes in the UK but is largely focussed on facilities which fall within COMAH regulations (i.e. those containing significant quantities of hazardous substances) and later stages of design than planning. While this existing guidance has been referred to, it is important to note that based on current development information the Proposed Development is not considered to engage COMAH 2015 as quantities of hazardous substances are expected to be too low to meet or exceed COMAH threshold limits.

- 17.2.9 The general principles of existing guidance are relevant to, and have been taken into account in the development of the approach to the assessment of major accidents and disasters in the following respects:
- ▶ Determining the criteria for a major accident;
 - ▶ Concept of removing intolerable risk and reducing residual risk to ALARP; and
 - ▶ Tolerability criteria for defining significant effect.
- 17.2.10 See **Table 17-2** for full list of guidance documents referenced.

Table 17-2 Major accident and disaster guidance

Guidance	Summary description
Environmental Impact Assessment of Projects, Guidance on the Preparation of the Environmental Impact Assessment Report, European Commission, 2017	Guidance on how to develop a good quality environmental impact report to ensure appropriate information is available for decision making purposes. The guidance provided by the EC highlights that the context for inclusion of major accidents and disasters as a topic in EIAs is to ensure that adequate focus is given to the provisions for events leading to significant risk with an objective of building resilience in a development against such effects. The bar for what is tolerable to society is therefore set higher for major accidents and disasters than for a smaller event of much lower magnitude.
Guidelines on Environmental Management for Facilities Storing Bulk Quantities of Petroleum Products and Other Fuels, Energy Institute 2015	Guidance on managing environmental issues involved in the design, construction, operation and decommissioning of bulk storage facilities. Promoting application of good environmental management systems and environmental risk assessment, and addressing inherent environmental protection. Applicable to facilities which do not fall into COMAH 2015 regulations, and those that do.
Chemical and Downstream Oil Industries Forum (CDOIF) – Environmental Risk Tolerability for COMAH Establishments V2	Guidelines on the assessment and tolerability of major accidents to the environment (established in relation to COMAH sites).
Guide to Predicting Environmental Recovery Durations for Major Accidents Energy Institute 2017	Establishes guidance on recovery time for ecosystems following a major accident in relation to the environmental fate of released chemicals.
Guidance on the Interpretation of Major Accident to the Environment for the Purposes of COMAH Regulations, 1999, Department of the Environment, Transport and the Regions, 1999	Guidance on what would constitute a major accident to the environment (from the perspective of COMAH 2015 regulations).
All Measures Necessary – Environmental Aspects (Guidance to the Competent Authority Inspectors and Officers), 2016. Health and Safety Executive (HSE)/Environment Agency (EA)/Scottish Environment Protection Agency (SEPA)/Natural Resources Wales, Office of Nuclear Regulation (ONR)	Guidance in relation to COMAH for the prevention and mitigation of environmental aspects of major accidents, and discussion of concepts for proportionality and risk tolerability.
Safety and Environmental Standards for Fuel Storage Sites Process Safety Leadership Group Final Report, HSE 2009	Standards established to specify minimum standards of control storing large quantities of gasoline. Applicable to facilities falling within scope of COMAH.
Guidance on Hazardous Substances https://www.gov.uk/guidance/hazardous-substances accessed 1/12/2017. Ministry of Housing, Communities & Local Government (formerly known as the Department of Communities and Local Government)	Guidance on how to consider hazardous substances in land use planning and relevant planning controls. It includes guidance on how to assess whether Hazardous Substance Consent is required based on the intended inventory.

Guidance	Summary description
Guidelines for Environmental Risk Assessment and Management: Green Leaves III, 2011. Dept for Environment, Food and Rural Affairs	Guidelines for the management and assessment of environmental risk.
CIRIA C736 Containment Systems for the Prevention of Pollution: Secondary, Tertiary and Other Measures for Industrial and Commercial Premises.	Good practice guidance on pollution prevention to assist owners and operators of commercial and industrial premises storing substances which may be hazardous to the environment.
Reducing Risks, Protecting People (R2P2), HSE, 2001	HSE's decision making process. Protocols and procedures followed in decision making in relation to protection of human life in the UK.
European Aviation Safety Agency (EASA) Acceptable Means of Compliance (AMC) and Guidance Material (GM) to Authority, Organisation and Operations Requirements for Aerodromes	Guidelines for aerodrome compliance & guidance, management systems, oversight, licensing & enforcement and operational services, equipment, installations and maintenance.
EASA Certification Specifications and Guidance Material for Aerodromes Design CS-ADR-DSN	Guidance on the design of aerodromes including runways, taxiways, aprons, electrical systems and de-icing facilities.
CAP 168 Civil Aviation Authority. Licensing of Aerodromes	Guidance to applicants and license holders on the procedure for the issue and continuation of, or variation to, an aerodrome license, and to indicate the licensing requirements that are used for assessing a variation or an application.
CAP 393 The Air Navigation Order 2016 and Regulations	Guidance on the provisions of the Air Navigation Order (as amended) together with Regulations made under the order.
CAP 642 Civil Aviation Authority. Airside Safety Management	Guidance for accepted good practise for airside activities. It identifies how risks can be identified and provides advice about how airside safety can be achieved through a systematic and structured management approach.
CAP 700 Civil Aviation Authority. Operational Safety Competencies	Guidance on skills required for safe aviation operations at executive management level.
CAP 736 Civil Aviation Authority. Operation of Directed Light, Fireworks, Toy Balloons and Sky Lanterns within UK Airspace	Guidance for commercial organisations and individuals planning to operate directed light, fireworks, toy balloons and sky lanterns in UK airspace.
CAP 760 Civil Aviation Authority. Guidance on the Conduct of Hazard Identification, Risk Assessment and the Production of Safety Cases	Guidance on verifying that any significant Air Traffic Control (ATC) changes are acceptable using a safety assessment demonstrating that an acceptable level of risk will be maintained.
CAP 772 Civil Aviation Authority. Wildlife Hazard Management at Aerodromes	Guidance to assist aerodrome operators in establishing and maintaining an effective Bird Control Management Plan (BCMP), including measures to assess birdstrike risk at the aerodrome and the identification of appropriate action to minimise that risk.
CAP 795 Civil Aviation Authority. Safety Management Systems guidance for organisations.	Guidance on safety management of operational airports including risk criteria for human harm.
CAP 1616 Airspace Design: Guidance on the regulatory process for changing airspace design including community engagement requirements	Guidance on the process required for a change in the airspace above and around an airport.

17.3 Data gathering methodology

- 17.3.1 This section describes the desk study methodology which has been undertaken to inform the assessment of major accidents and disasters.
- 17.3.2 The study area has been defined as follows:

- ▶ The Development Consent Order (DCO) Red Line Boundary (RLB) area plus 1km study area outside the DCO red line area for land receptors, including population, designated land and biodiversity;
- ▶ The DCO RLB area plus 1km study area outside the DCO RLB for groundwater receptors;
- ▶ The DCO RLB area plus 10km study area outside the DCO RLB (downstream) for surface water receptors; and
- ▶ In addition, for in-flight major accidents under the control of Manston and within the design swathe (1.5km either side of the intended flight paths):
 - ▶ Passengers and crew on a plane while under the control of Manston Airport; and
 - ▶ Receptors within the design swathe.

17.3.3 **Table 17-3** sets out the principal sources and data sets that have been consulted for the purposes of establishing the list of potential relevant receptors and sources.

Table 17-3 Base data

Topic	Source of Information
Topography, Elevation, Relief Climate	See Chapter 8: Freshwater Environment
Water Quality	See Chapter 8: Freshwater Environment
Flood Risk	See Chapter 8: Freshwater Environment
Hydrogeology	See Chapter 8: Freshwater Environment
Soils and Soil Type	See Chapter 8: Freshwater Environment
Water Abstractions and Discharges	See Chapter 8: Freshwater Environment
Biodiversity	Chapter 7: Biodiversity EA maps ³ National Biodiversity Network Atlas ⁴
Historic Environment	See Chapter 9: Historic Environment
Designated and Non-Designated Sites	Chapter 7: Biodiversity www.magic.gov.uk: Natural Environment Interactive Map EA ⁵ What's in Your Backyard North East Kent (Thanet) SIP, Natural England, 2014 Angling Trust ⁶

Topic	Source of Information
Populations and Communities	Census data obtained through CACI Ltd (20/06/2017) which processes and supplies Census information for the UK.
Climate Change	See Chapter 16: Climate Change
Seismicity	British Geological Survey: Earthquakes in the UK ⁷ and Geological map ⁸
Tolerability	<p>CDOIF – Guideline Environmental Risk Tolerability for COMAH Establishments V2¹⁴</p> <p>Guide to Predicting Environmental Recovery Durations for Major Accidents Energy Institute 2017⁹</p> <p>Guidance on the Interpretation of Major Accidents to the Environment for the Purposes of COMAH Regulations, 1999, Department of the Environment, Transport and the Regions, 1999¹⁰ (Note while this refers to 1999 regulations, it continues to be an underlying reference for current Major Accident Guidance e.g. CDOIF¹⁴)</p> <p>Reducing Risks Protecting People (R2P2), HSE, 2001¹¹</p>
External sources of Risk and Natural Disasters	<p>The following public information has informed aspects of the assessment:</p> <ul style="list-style-type: none"> ▶ National Risk Register of Civil Emergencies – 2017 Edition¹²; ▶ Kent Community Risk Register, 2016¹³; and ▶ Civil Aviation Authority (CAA) CAP 1627 (and BT): Drone Risk: An Assessment (and Bowtie).
Site and drainage	See Chapter 3: Description of the Proposed Development and the site Masterplan

Desk Study

- 17.3.4 A desk study has been undertaken to assess the potential impact of major accidents and disasters to relevant receptors within the study area. It made reference to the receptor data sources in **Table 17-3** and was undertaken proportionately, but in accordance with the general principals outlined in guidance for the assessment and risk tolerability of major accidents to the environment and to populations (developed by the CDOIF¹⁴ and the HSE¹¹, respectively).

Survey Work

- 17.3.5 No survey work has been carried out specifically for this Chapter. However, as noted above and where relevant, the assessment of major accidents and disasters draws on the primary and secondary data contained in other chapters.

Consultation

EIA Scoping

- 17.3.6 Major accidents and disasters are a new consideration under the 2017 EIA Regulations.
- 17.3.7 This Chapter was not included at the Scoping Stage as scoping was undertaken under the 2009 EIA regulations, under which this topic was not required.

Statutory consultation

- 17.3.8 There has been ongoing discussion and meetings with the EA and Southern Water (SW), particularly in relation to the fuel farm, and this information has been considered within the design of the Proposed Development and in the assessment for the purposes of this Chapter.
- 17.3.9 Consultation responses have been received on the 2018 PEIR. These are summarised in **Table 17.4**.

Table 17.4 Consultation Responses

Consultee	Comment	Response
Stone Hill Park Limited	<u>PEIR: Major accidents</u> Study area not wide enough in light of likely flight paths. Assessment should include realistic worst-case scenario such as overflying most populated and most ecologically sensitive areas. Not acceptable to not to assess based on Civil Aviation Authority flight process having not taken place yet.	The study area has been selected to capture all credible foreseeable events arising at the airport, including those with effects downstream of the airport drainage, and those within the design flight swathe. Proportionate assessment has been made.
	<u>PEIR: Major accidents</u> No information on safeguarding zones around the airport. What are the safeguarding zones and what does an increased risk profile look like for surrounding area of crashes, terrorist attack, cyber-attack.	The assessment reported in this Chapter, includes consideration of flight incidents and malicious acts including terrorism. The aerodrome and airspace will be designed to take account of safeguarding in line with CAA CAP 168 and CAP 1616.
	<u>PEIR: Major accidents</u> Sensitive land uses not identified e.g. schools, hospitals, residential institutions.	Vulnerable populations have been reviewed as part of this Chapter. A small number of sensitive land uses exist within the 1km study bounds for land but are at distance from the development. Some vulnerable populations exist within the flight design swathe and have been proportionately taken account of in the assessment, alongside other public and residential populations. Risk to those in the flight swathe is extremely low. The assessment considers effects on general public population, airport users and airport/construction workers.
	<u>PEIR: Major accidents</u> Future baseline does not give consideration to population changes in the future.	Planned future developments are allowed for in the cumulative chapter (Chapter 18: Cumulative Effects Assessment of this ES).
	<u>PEIR: Major accidents</u> Incorporated measures only consider risks from fuel spillage. No commentary on security and resilience of the airport to other risks.	Airport security and resilience is fundamental to EASA licensing. Relevant CAP and CAA guidelines will be followed including those of security.
	<u>PEIR: Major accidents</u> Lists of types of incidents omits key risks - plane crash, drone strike, bird strike, cyber-attack.	The PEIR only presented a high level preliminary list of types of incidents. This Chapter of the ES provides more refined detail and all of the items listed have now been assessed (see Table 17-5).
Health and Safety Executive	<u>PEIR Chapter 17: Major Accidents</u> According to HSE's records there are no major accident hazard installations with Hazardous Substances Consent.	This is understood and forms one of the assumptions of this Chapter.
	<u>PEIR Chapter 17: Major Accidents</u> HSE unable to verify whether a Hazardous Substance Consent (HSC) application will be needed for the fuel farm and potentially for the Cargo facilities 1-4. Proximity of housing may have an impact.	Based on current understanding of the anticipated chemicals and their quantities, a HSC would not apply and HSC/COMAH thresholds would not be reached in aggregate.

Consultee	Comment	Response
	PEIR Chapter 17: Major Accidents Presence of hazardous substances above set threshold quantities may require HSC.	Based on current understanding of the anticipated chemicals and their quantities, a HSC would not apply and HSC/COMAH thresholds would not be reached in aggregate.

17.4 Overall major accident and disaster baseline

Introduction

- 17.4.1 The baseline described below draws heavily on the findings of several chapters contained elsewhere in this ES, in addition to the information gathered during the desk based review conducted as part of this Chapter. There is inevitably a degree of commonality in terms of the receptors considered across the chapters. Only those chapters where it is important to highlight context specific to major accident and disasters, or where they are not part of discussion elsewhere, are therefore considered below.

Current baseline

- 17.4.2 The airport is not currently operating for commercial freight or scheduled flight purposes. Polar Helicopters, a charter helicopter company, operates from a hangar to the north of the site. This business will be retained, but is likely to be relocated to the new business aviation facility.
- 17.4.3 The RAF Manston History Museum and the Spitfire and Hurricane Museum are located on the 'Northern Grass' area. Their current location is safeguarded on the masterplan, although the final location and form of the buildings will be the subject of further discussions with the operators of the museum.
- 17.4.4 A fuel farm exists to the south east, within the RLB. This fuel farm is a private enterprise and supplier of fuels for a variety of marine purposes. The existing fuel farm holds fuel in similar quantities to those anticipated for the future proposed airport use, with filling and unloading taking place to serve the activities of the current owners.

Topography and geology

- 17.4.5 These are discussed in **Chapter 8: Freshwater Environment**.
- 17.4.6 The site RLB includes a proportion of the buried drainage pipeline. This pipeline in its entirety extends from the southern portion of the RLB to the outfall point in Pegwell Bay.

Surface Water designation and other water features (rivers)

- 17.4.7 These are fully discussed in **Chapter 8: Freshwater Environment**.
- 17.4.8 There are no river watercourses on or adjacent to the site. A series of water channels and streams forming part of Minster Marshes are located more than 1km south of the site. The buried pipeline connecting the site to the Pegwell Bay outfall is in part in closer proximity to the system.
- 17.4.9 For this major accidents and disasters Chapter, significant sites up to 10km downstream of the DCO RLB or beneath the flight path design swathe are also included for assessment. No site-specific surveys (offsite) have been undertaken or have been deemed to be necessary for the assessment. The Great Stour is the most significant river identified. This is located approximately 3km south of the Proposed Development. A collection of smaller rivers and streams, tributaries of the Great Stour, are also present. The Great Stour flows into Sandwich and Pegwell Bay.

Coastal, Land and Marine designation and features

- 17.4.10 These are fully discussed in **Chapter 7: Biodiversity** and its associated appendices, in particular **Appendix 7.1**.
- 17.4.11 There are a number of internationally/nationally designated water sites within the study bounds, including:
- ▶ The north coast of the Isle of Thanet (approximately 3.5km from the site) which is designated as a Site of Special Scientific Interest (SSSI), Special Area of Conservation (SAC), Special Protected Area (SPA) and Ramsar site; and
 - ▶ Sandwich and Pegwell Bay, located 1.5km to the south east. These bays are part of designated National Nature Reserve (NNR), Ramsar, SSSI, SPA and SAC sites.
- 17.4.12 The Proposed Development, due to the proximity of the Sandwich and Pegwell Bay SSSI, has been identified as falling within the associated SSSI risk zonesⁱ.
- 17.4.13 The coastal areas in the study boundary involve priority habitats including; coastal saltmarsh, coastal sand dunes, mudflats, maritime cliffs and slopes, coastal and floodplain grazing marsh and intertidal substrate foreshore.
- 17.4.14 Several inland Habitats of Principal Importance (HPI) were also identified including deciduous woodland, lowland fens and traditional orchids.
- 17.4.15 The marine area is listed for fisheries and fishing activity as shellfish waters.
- 17.4.16 No significant internationally/nationally designated land sites are located within 1km of the DCO RLB. However, sites within the flight design swathe are also included for assessment. Sites within the flight design swathe include:
- ▶ Preston Marshes, located approximately 9km south west from the site. This area is designated a SSSI site;
 - ▶ Stodmarsh NNR, located 8km south west from the site. This area is designated a SSSI, SAC, SPA and Ramsar site; and
 - ▶ The Swale NNR, located approximately 18km north west from the site. This area is designated a SSSI, SPA and Ramsar site.
- 17.4.17 Several Local Nature Reserves (LNR) are located within the flight design swathe and are classed as 'other' designated land for this assessment. These sites are not internationally or nationally designated areas.

Soils and Land Use

- 17.4.18 Land use is fully described in **Chapter 10: Land Quality**.
- 17.4.19 The airport has historically been used for military and civilian aircraft operations. There may therefore be hazards associated with this historic use which will need to be identified and managed, both in construction and operation. These are included in the assessment of major accidents and disasters. Other potential causes identified to date, fall within categories of hazard which are typically envisaged for the type of development planned.
- 17.4.20 The site is bordered by roads that run along its perimeter and the B2050 crosses the site in the north. This is used on a regular basis and has several junctions with minor roads and other access points along its length. The local road network is described in greater detail in **Chapter 14: Traffic and Transport**.

ⁱ Zones around each SSSI site (the extent of which reflects the sensitivities of the features for which the site is notified) that indicate the extent beyond the SSSI where development proposals may still have adverse impacts on the SSSI.

- 17.4.21 Farmland and industrial/retail areas (including Manston Fire Museum) also surround the site and will be occupied to varying degrees, depending on the specific usage.
- 17.4.22 Residential dwellings exist sporadically around the perimeter of the Proposed Development, in generally small numbers. Within the study boundary of 1km (partially or fully) there are a small number of villages, though these are more remote from the site. They include Manston, Cliffsend, Acol and Minster. Larger settlements are more remote and beyond the 1km study boundary, though some are located within the flight design swathe. Settlements within the flight swathe are principally:
- ▶ Ramsgate, located 1.5km east of site with a population of 40,513;
 - ▶ Herne Bay/Hampton, located 12km north west of site with a population of 40,250;
 - ▶ Kingsdown, located 17km south of site with a population of 1,721,
 - ▶ Whitstable, located 19km west of site with a population of 33,398, and
 - ▶ Seasalter, located 22km west of site with a population of 8,128.

Flood Risk

- 17.4.23 **Chapter 8: Freshwater Environment** and **Appendix 8.2** give a detailed assessment of flood risk.

Site Drainage

- 17.4.24 **Chapter 3: Description of the Proposed Development** provides a description of site drainage. This is further assessed in **Chapter 8: Freshwater Environment** and **Appendix 8.2**.
- 17.4.25 The main site discharge is at the south eastern site boundary via a 1200mm drainage pipe which outfalls at Pegwell Bay. This discharge point will also serve as the main discharge drainage point for the proposed fuel farm.

Surface Waterbodies

- 17.4.26 **Chapter 8: Freshwater Environment** gives a detailed assessment of surface waterbodies.
- 17.4.27 The southern part of the Proposed Development is located within the Monkton and Minster Marshes surface waterbody (within the Stour Marshes Operational Catchment). Neither of the two waterbodies are currently of good status, although mitigation measures have been identified that will provide improvement from the current status by 2027 for both water bodies.
- 17.4.28 For the major accidents and disasters chapter, significant sites within the flight path design swathe and a 10km study area outside of the DCO RLB were also included.

Groundwater Body

- 17.4.29 **Chapter 8: Freshwater Environment** gives a detailed assessment of groundwater bodies.
- 17.4.30 The Manston Airport site is located entirely within a groundwater SPZ catchment^{ii,5}. The inner zone (SPZ1), where the consequences of damage from a major release would be highest if it occurred, is at the eastern end of the site and in a strip beneath the runway. This is surrounded by a wider area of outer zone (SPZ2), that also dominates the area beneath the runway, in the south of the site. The remainder of the site falls within the wider SPZ catchment area (SPZ3).

ⁱⁱ The EA have defined SPZs for 2000 groundwater sources such as wells, boreholes and springs used for public drinking water supply. These zones show the risk of contamination from any activities that might cause pollution in the area. The closer the activity, the greater the risk. There are three main zones (Zone 1 - inner, Zone 2- outer and Zone 3 - total catchment).

- 17.4.31 The Proposed Development is also located within a Safeguard Zone and a groundwater Nitrate Vulnerable Zone.
- 17.4.32 There are no licensed abstractions located within the Proposed Development boundary, but a number of people and organisations are licensed to abstract water from groundwater or ponds/lakes up to 1km outside the site boundary.
- 17.4.33 For this Chapter, significant sites within the flight path design swathe were also included. A collection of groundwater SPZs were identified approximately 8km south of site.

Historic and Heritage Sites

- 17.4.34 The site lies within an area of local and regional historic significance because of its siting on the Isle of Thanet. The historic environment and heritage sites are described fully in **Chapter 9: Historic Environment**. Designated heritage assets, including those within the 1km study area, are also described fully in **Chapter 9: Historic Environment**.
- 17.4.35 Two Scheduled Monuments (SMs) exist within the 1km study area and near the site:
- ▶ Anglo-Saxon Cemetery south of Ozengell Grange (List Entry 1004228); and
 - ▶ Enclosure and ring ditches east-northeast of Minster Laundry (List Entry 1004203).
- 17.4.36 There are 24 listed buildings surrounding the site within the 1km study area, though none are located within it.
- 17.4.37 The Conservation Area of Acol lies partially within the 1km study area.
- 17.4.38 Significant sites within the flight path design swathe include:
- ▶ Five Grade I listed buildings (churches) located predominantly in the Ramsgate area; and
 - ▶ Six SMs located between 2 and 30km from site.
- 17.4.39 There are no World Heritage Sites (WHS) within the 1km study area or the flight swathe. The nearest WHS is Canterbury Cathedral, located approximately 18km south west of the site.
- 17.4.40 Further Grade II listed buildings exist in the 1 km study bound.

Population and Human Health

- 17.4.41 Populations within the 1km study boundary include (partially or fully) Manston, Minster, Acol and Cliffsend, as well as workers and visitors to the Proposed Development and surrounding commercial premises. The predicted number of passengers and workers during construction and operation at the airport is described in **Chapter 3: Description of the Proposed Development**.
- 17.4.42 No large schools or hospitals were identified within the 1km study boundary.
- 17.4.43 The northern area of Cliffsend contains approximately 200 houses, which are located close to the RLB, and a small number of these are in close proximity to the proposed fuel farm location.
- 17.4.44 The 'Northern Grass' area of the DCO boundary is close to a small number of residential houses and two museums are located within the DCO boundary (RAF Manston History and Spitfire & Hurricane Memorial museums).
- 17.4.45 Aircraft users (flight crew, passengers etc.) are also included while they are under the direct control of Manston Airport and control tower.
- 17.4.46 The baseline assumes that the travel undertaken by passengers and air crew is required regardless of the presence of an airport at Manston, in a 'do nothing scenario' it is therefore assumed, with the travel still conducted but by a different transport mode. At this time, it is not possible to say what the likely mode of travel would be, however it could be train, private car, passenger ferry, bus or plane (via an alternative airport), depending on the destination.

- 17.4.47 Significant sites within the flight swathe include:
- ▶ The towns of Ramsgate, Whitstable, Herne Bay, Kingsdown and Seasalter;
 - ▶ Coastal resorts and museums; and
 - ▶ Schools and hospitals.
- 17.4.48 The 1km study area outside of the RLB and the flight swathe excludes the large settlements of Broadstairs and Margate.
- 17.4.49 Developments which are either awaiting a decision, or that have been granted permission, have been considered during the assessment to allow for potential cumulative effects between them and the Proposed Development to be assessed. These developments include residential and business properties, industrial units, roads, parking and fencing. Cumulative effects are considered in **Chapter 18: Cumulative Effects Assessment**.
- 17.4.50 Road use and transport is comprehensively covered in **Chapter 14: Traffic and Transport**.

Natural Phenomena and Climate Change

- 17.4.51 Climate change is addressed in **Chapter 16: Climate Change** and provides information to support the assumptions applied to the major accident and disaster assessment. Flood risk is considered in **Appendix 8.2**.
- 17.4.52 **Chapter 16: Climate Change** has considered the impact of conditions such as fog, wind direction, lightning, extreme wind and storm, and high temperature. It is predicted that generally winters will become wetter and summers drier, and that peak rainfall intensities could increase, with a consequent effect on the frequency and magnitude of high river flows. Mean sea levels are also predicted to rise, and may be accompanied by an increase in the frequency and magnitude of flood events as a consequence.

Seismicity

- 17.4.53 Compared to most of the UK, the Kent region is an area of low seismicity. Regional variations exist and the British Geological Survey (BGS) indicates a Peak Ground Acceleration (PGA; g) of 0.02-0.04¹⁵ for the development area, which is considered to be low, compared to many locations elsewhere in the UK.
- 17.4.54 The Seismic Hazard Harmonisation in Europe project¹⁶ determines that the Isle of Thanet has a higher peak ground acceleration than the wider Kent region; however, this is still within the low category. The highest regions of seismic activity in the UK are considered to be Snowdonia and South Wales. In the period 1956 to 2017 one earthquake was recorded off the coast of Ramsgate (Magnitude 4.2, at a depth of 9.1m, 22/05/2015). No earthquakes have been recorded onshore in the same period. Historically, for the South East, a magnitude 4.6 earthquake was recorded on land by BGS in Colchester in 1884, and an earthquake in 1580 has been listed of magnitude 5.8 (Dover Straits).
- 17.4.55 Damaging earthquakes in the UK are very rare, despite 20-30 being felt each year by people. When damage does occur, it is not to the same level of severity as that observed in high seismic regions elsewhere in the world, and would not generally be expected to lead to major infrastructure damage. The earthquake in Colchester is considered to be the most damaging known, with approximately 1200 buildings needing some level of repair, including collapsed chimneys and cracked walls.
- 17.4.56 In Britain the largest known earthquake took place 60 miles offshore at Dogger Bank in 1931, with a magnitude of 6.1. Minor damage was caused to buildings on the south east coast as a result of the earthquake.

Flooding

- 17.4.57 EA flood mapping indicates that the whole of the Manston Airport site is located within an area where flooding from rivers and the sea is very unlikely (Flood Zone 1, where there is a less than a 0.1 per cent [1 in 1000] chance of flooding occurring each year). The nearest flood risk is coastal flooding associated with Pegwell Bay, located approximately 1.5km south east of the site.
- 17.4.58 Flooding from land (rainfall run-off and surface water flooding) is considered to be a potential source of flood risk to the Proposed Development, in particular in the lower elevation ground across the middle of the site. The flood risk would occur through rainfall falling directly onto the development site, particularly when the ground is saturated. The majority of this flood risk has been identified to be of low risk (each year, the chance of flooding is between 1 in 1000 [0.1%] and 1 in 100 [1%]). There are areas of higher risk (with a greater than 1 in 30 [3.3%] chance of flooding) which are likely to be associated with localised depressions. The peak monthly rainfall at Manston since 1934 was for the month of October 1939 at 271.8mm.
- 17.4.59 It is anticipated that there will be sewers and associated infrastructure across the site, based on its previous use as an operational airport. Therefore, there is a potential risk of sewer flooding.
- 17.4.60 Further detail on the sources of flood risk to the site can be found in **Appendix 8.2**.

Extreme Storms

- 17.4.61 Hurricanes are tropical features also requiring sea temperatures much higher than those around the UK. The country is sometimes affected by deep depressions, which were originally hurricanes that have moved to higher latitudes. They are classified as 'ex-hurricanes' or 'extra-tropical-cyclones'.
- 17.4.62 A significant storm of this type passed through Kent in October 1987, with wind speeds reaching 100 mph¹⁷. However, severe storms leading to significant damage are rare events in the UK. Lightning strikes occur relatively frequently during storms. The Kent region experiences approximately 1-2 lightning strikes per km² each year¹⁸; the vast majority do not cause damage or injury.

Tsunami

- 17.4.63 Tsunamis are extremely uncommon in the UK, and when they do occur their impacts are usually minimal. The only tsunami recorded since 1929 was in 2011 in which 40cm waves hit parts of the south coast of England¹⁹.

Tornadoes

- 17.4.64 Tornadoes occur frequently in the UK with around 30 reported each year. Although these are usually very weak²⁰, there have been a number of notable exceptions, with the Birmingham tornado on July 28th, 2005 causing approximately £40m worth of damage.
- 17.4.65 The UK regions most likely to have a tornado are between London and Reading, Bristol to Manchester, north east London to Ipswich and the south coast of Wales near Swansea²¹. There is therefore only a small probability that tornados would reach Kent.
- 17.4.66 Determined by research supported by the Tornado and Storm Research Organisation (TORRO), there is approximately a 2% cumulative percent probability of a tornado occurring in the 10km grid box containing the Manston site per year, using a 15 day temporal and 50km spatial smoothing parameter²².
- 17.4.67 The UK Climate Projections (UKCP09) website is the leading source of climate information in the UK, and is designed to help users to adapt to changes in climate. It predicts that there will be an increase in the frequency and intensity of storms and high winds: however, this is of low certainty.

Snow/extreme cold

- 17.4.68 The UK is not subject to extreme cold weather. The lowest mean minimum temperature reached in the area of the Proposed Development since 1934 is -3.5°C in January 1963²³. An increase in annual average temperature and fewer days with snow and frost is predicted by UKCP09. In addition, it is predicted that there will be short periods of intense cold weather: however, the prediction states that this is of low certainty.
- 17.4.69 The region of the Proposed Development has typically approximately 5 to 10 days a year in which snow is lying on the ground. Snow events causing multiple loss of life are rare in the Kent region and in the UK generally. The most disastrous snow event in the UK was an avalanche in East Sussex in 1836, in which 8 lives were lost²⁴.

Subsidence

- 17.4.70 The Isle of Thanet is underlain by the middle sequence of the Upper Chalk Formation (White Chalk sub-group), which is part of the North Downs outcrop that extends from the west near Guildford in Surrey to the Isle of Thanet on the east coast of England. The outcropping Chalk units are the upper Newhaven Chalk, the Seaford Chalk and underlying Lewes Nodular Chalk. The total thickness of the Chalk is between 237m at Margate and more than 275m at the southern limit of the Newhaven Chalk outcrop.
- 17.4.71 The Newhaven Chalk underlies most of the Isle of Thanet, and is composed mainly of smooth white chalk without marl seams and with few flint bands. The Chalk is overlain by the Lower London Palaeogene Group, comprising the Thanet Formation, Lambeth Group and Thames Group. These formations are sands, silts and clays with pebbles and flint, but have not been confirmed as extending across the airport site itself. Local to the Manston Airport site the underlying bedrock is the Chalk dipping to the south, and trial pits recorded on the BGS website indicate that the Chalk is present at a very shallow (~1m) depth. Although mapped to the north east of the site, the Thanet Formation was not encountered in the trial pits across the site, although could potentially be located beneath the north east part of the site.
- 17.4.72 Chalk dissolution can cause a subsidence hazard producing difficult engineering challenges. **Chapter 10: Land Quality** has identified a small number of chalk pits within the Proposed Development bounds and historic land fill sites in close proximity. Possible risks from other works will also require confirmation through inspection. For example, it is known that tunnels exist in the Thanet area¹⁷³, though none have been uncovered in recent years or have been confirmed at the Proposed Development.
- 17.4.73 The BGS has mapped the Isle of Thanet area to be of either low or medium risk for shrink-swell hazard potential.
- 17.4.74 There are areas of the site which are in bands of elevated radon potential (maximum radon potential is 1-3 %) ²⁵. The BGS has mapped the Isle of Thanet area to be of either low or medium risk for shrink-swell hazard potential.

Fog

- 17.4.75 The site is elevated in comparison to the surrounding landscape, which reduces the potential for reduced visibility as a result of fog.

Drought

- 17.4.76 Severe drought can lead to high levels of dust in the air which reduces visibility and increases the risk of damage to infrastructure such as roads. Since 1854 there have been 9 major droughts recorded in the UK, with the most recent between 1995 and 1997²⁶. During this period there was surface water stress, depressed groundwater levels and diminished lowland stream networks.
- 17.4.77 Wildfires are a problem that can arise from severe droughts, but are not generally expected in the Kent region. They can occur where vegetation becomes dry and can burn more readily. The

England and Wales Fire Severity Index predicts how severe a fire could become if one were to start. The index concludes that a fire at the Proposed Development would have a low severity index²⁷, in line with the rest of England and Wales.

- 17.4.78 **Chapter 16: Climate Change** indicates that it is very likely that the future climate will include increased dry spells in the UK.

High temperature

- 17.4.79 The highest mean maximum temperature reached at the site since 1934 is 25.4°C in July 2006. The highest temperature recorded in England is 38.5°C in Kent in 2003²³. There is a general trend to warmer, drier summers and milder wetter winters predicted by UKCP09. In addition, it is predicted that there will be an increase in very hot days.

Potential Sources of major accident and disaster

- 17.4.80 It is necessary to identify credible sources of major accidents and disasters which may theoretically be associated with the Proposed Development (either arising from it, or impacting upon it [e.g. those associated with natural disasters], including those which occur due to combined effects with other adjacent operations or features) so that potential significant adverse effects are understood and described.

All lifecycle phases and proposed activities are of relevance (construction, airport operations and fuel storage associated day to day activities, and emergency operations). Natural phenomena (e.g. extreme weather events) of relevance to the Kent area are also included. The study is based on full airport operations (planned to be at Year 20), and allows for climate change within the study period (as considered in **Chapter 16: Climate Change**). Particular consideration is given to those sources of major accidents and disasters with potential to harm the most sensitive receptors.

- 17.4.81 A list of typical sources of major accidents and disasters hazards which can be associated with airport and fuel storage operations is given in **Table 17-5**. This list provided a starting point for the assessment and a framework for structured review even though some of the events may be only remotely possible, if at all, at the Proposed Development. The Proposed Development has been assessed against the list of typical hazard sources, with additional site hazard sources added, where identified.

- 17.4.82 Within **Table 17-5**, four groupings of 'source' are provided:

- ▶ Construction phase major hazards - man-made accident hazards resulting from construction activities and equipment;
- ▶ Operational phase major hazards - man-made accident hazards resulting from operations, activities and equipment at an airport;
- ▶ External major hazards - man-made accidents resulting from operations, activities and equipment external to an airport development. These are relevant to both operation and construction phases of an airport, unless otherwise indicated; and
- ▶ Disaster hazards - natural disasters resulting from the occurrence of natural adverse conditions or events. These are relevant to both operation and construction phases of an airport, unless otherwise indicated.

- 17.4.83 The assessment methodology is that of a qualitative desk-based review. The findings are derived from review of publicly available information and information developed as part of the work conducted for other topics of the ES, including the design basis contained in **Chapter 3: Description of the Proposed Development**. The current design understanding is that the Proposed Development is not anticipated to hold large quantities of hazardous substances of relevance to major accidents (and so is not anticipated to fall under COMAH 2015 or require HSC). Decommissioning effects have been scoped out of the assessments as the airport is envisaged to operate in perpetuity.

Table 17-5 List of typical sources of major accidents and disasters hazards

Operational Phase Major Hazard	Construction Phase Major Hazard
Design	Construction design/planning
Safety/environmental and emergency management	Construction safety/environmental and emergency management
Air incident - on ground	Interaction with airport operations - equipment
Air incident - in flight	Interaction with airport operations - management and logistics
Aircraft Fuel handling/storage/transfer - impact/collision/fire/explosion/toxic or ecotoxic release	Structural/civils collapse
Freight/cargo handling/storage/transfer - damage/impact/fire/explosion/toxic or ecotoxic release	Collapse of excavation
Operational chemical (e.g. pesticide, de-icer, heating fuel, vehicle fuel, diesel backup) - flammable/toxic/ecotoxic release	Removal/collapse of hazardous spoil
Waste - flammable/toxic/ecotoxic release	Piling
Aircraft Maintenance, repair, overhaul - flammable/toxic/ecotoxic/radioactive release	Fuel/chemical handling/storage/transfer - fire/explosion/toxic or ecotoxic release
Terminal /buildings/workshops/offices/roadways/carparks - fire/ecotoxic or toxic release	Waste handling/storage/transfer - fire/explosion/toxic or ecotoxic release
Tenant buildings and controls - fire/ecotoxic or toxic release	Equipment/tank disposal and commissioning
Contaminated food/drinking water	Loss of utilities/infrastructure
Contaminated building - heating/ventilation systems (legionella)	Loss of essential safety/environmental systems
Quarantine/warehousing (food/animals/controlled substance)	Temporary storage
Structural collapse	Contractor compounds/buildings/workshops/offices/roadways/carparks - fire/ecotoxic or toxic release
Loss of utilities/infrastructure	On-site pipelines or underground services
Loss of essential safety/environmental systems	Historic site specific hazard (e.g. unexploded ordnance (UXO), tunnels, chemicals, asbestos)
Extreme heat (e.g. flaring)	Transport accidents
Rotating equipment	Firefighting/firewater runoff
Incidents associated with on-site pipelines or underground services	-
Historic site specific hazard (e.g. UXO, tunnels, chemicals, asbestos)	-
Transportation of dangerous substances	-
Transport accidents	-
Firefighting/firewater runoff	-
Waterbodies	-
Drainage	-
External Major Hazard	Disaster Hazard
Contamination (e.g. drinking water supply)	Flooding (sea, river, rainfall, tsunami)
Transport accident	Catchment/flood plains mismanagement
Importation - biological agents/biohazard*	Seismic/earthquake
Importation - artefacts of international/national importance*	Subsidence

Importation - radiological hazards*	Snow/ice/hail
Importation - chemical hazards*	Extreme heat/cold
Malicious attack - terrorism, sabotage	Extreme low visibility/fog
Malicious attack - cyber security	Extreme storm - hurricane/gale/fog/drought
Malicious attack - vandalism, sabotage, theft	Lightning
Widespread utility/service/infrastructure failure	Ash cloud, volcanic eruption
Widespread industrial action	External aircraft interference - bird strike/wildlife issues*
Civil unrest/demonstration/widespread public disorder	Wildfire/forest fire
External aircraft interference - bird strike, drone, fireworks, Chinese lanterns, lasers*	Landslip/land slide
Structural collapse at neighbouring site	Disease outbreak, emerging infectious disease, animal disease, infestation
Fire/explosion/toxic release at neighbouring site	Importation - disease(human/animal/plant)/pathogen*
Wind turbine adjacent to site - radar and blade failure/throw*	Climate change/resilience from above (extreme changes to flood [from rainfall, river and sea], sea rise level, temperature, storm, tsunami, snow loading, and avalanche).

*indicates natural disasters or external events of potential relevance airport activities only (all others are of potential relevance to both airport and construction activities).

Factors influencing the baseline

- 17.4.84 Baseline conditions with influence on major accidents and disasters are those which could affect the severity or likelihood of a major accident or disaster over the lifetime of the Proposed Development (including the construction phase). This may include factors such as land use, biodiversity, climate change and seismic activity. Climate change and seismic activity could be of increased influence in later years. Changing land use may mean that the surrounding environment may become more agricultural, industrial, residential or recreational in use. Changing ecological baselines resulting from land use and climate change factors, may also impact the local ecology and associated environmental designations of the land and coastal/marine environment.
- 17.4.85 All of these changes could influence the interaction of the site with receptors and the pathways for any discharges from it. They could introduce or modify potential causes or receptors for major accidents and disasters.

Future baseline

- 17.4.86 The future baseline is described in the relevant receptor topic chapters of **Chapter 7: Biodiversity**, **Chapter 8: Freshwater Environment**, **Chapter 9: Historic Environment** **Chapter 10: Land Use** and **Chapter 16: Climate Change**.

17.5 Environmental measures incorporated into the Proposed Development

- 17.5.1 This section lists the environmental measures of specific relevance to major accidents and disasters which have been incorporated into the Proposed Development. Some of these have been included in the design specifically for major accidents and disasters risk management purposes. Others, while beneficial in reducing the impact of major accident and disaster risk, were developed primarily to reduce impacts considered in other chapters.
- 17.5.2 Following the grant of the DCO, and as the design advances through engineering design stages, risk assessments will be undertaken to account for all emerging and relevant engineering details in the evolving design scheme. Prior to operation, Safety Management and Environmental

Management Systems, with associated procedures and an Emergency Plan, will be developed and implemented.

- 17.5.3 Of particular significance to the Proposed Development, will be the rigorous requirements and standards set by:
- ▶ The EASA, including Aerodrome Certification Specifications and Guidance Material for Aerodromes Design CS-ADR-DSN, under which the airport will be certified;
 - ▶ Aviation industry guidance from EASA and the CAA under which the airport will operate (including those CAP documents listed in **Table 17-2**); and
 - ▶ Other industry standards for fuel storage and handling in design and operation, including HSG 176 (Storage of lammable liquids in tanks)²⁸, Energy Institute (EI) 1540 (Design, construction, commissioning, maintenance and testing of aviation fueling facilities)²⁹, CIRIA C736 (Containment Systems for the Prevention of Pollution)³⁰, EI Guidelines on Environmental Management for Facilities Storing Bulk Quantities of Petroleum, Petroleum Products and Other Fuels (Energy Institute Ed 3)³¹ and HSE Process Safety Leadership Group (PSLG) Buncefield recommendations³².
- 17.5.4 The broad approach adopted is that, where achievable and agreed, environmental and safety measures have been incorporated into the Proposed Development; the effect that those measures have on the significance of potential effects is taken into account within the assessment.
- 17.5.5 The measures covered in this section and Chapter relate to major accidents and disaster aspects only. Other aspects of environmental and safety measures, relating to measures to protect against planned activities, are considered in the other topic chapters.
- 17.5.6 A summary of the measures that have been incorporated into the construction phase of the Proposed Development in order to avoid, reduce or compensate for expected significant adverse effects associated with major accident and disaster features during the construction phases is provided in **Table 17-6**.

Table 17-6 Environmental measures incorporated into the construction phase of relevance to major hazards and disasters

Potential receptor	Predicated changes and potential effects	Incorporated measure
Land, surface and ground water (including particular species, designated sites and habitats)	Large accidental spillages of oils and other chemicals (including those associated with firefighting) associated with the construction process, escalation from external or airport based event or natural disaster entering the environment (land or water) as a potential pollutant to cause a major accident.	<ul style="list-style-type: none"> • Drainage and containment is further discussed in Chapter 8: Freshwater Environment. • Fuel, oil and hazardous chemical storage and handling will be minimised in the design of the works and safe working procedures including method statements for handling these substances and minimising the potential for spillage will be put in place. • Tanks and stored chemicals will be located away from excavations and high vehicle movements. • Oils, chemicals and fuels will be stored in designated locations with specific measures to prevent leakage and release of their contents into water receptors, including the siting of the storage area away from the drainage. • Any large quantity of fuel, chemical or oil (including those of waste) will be located away from the SPZ1 area and drainage routes to Pegwell Bay. • The risks from accidental spillages or leaks (including those arising as a result of loss of containment from extreme adverse weather) during handling and storage of chemicals and fuels will be mitigated by good working practices (e.g. set out in the Construction Environmental Management Plan [CEMP]). This is further discussed in Chapter 8: Freshwater Environment and Chapter 10: Land Quality.

Potential receptor	Predicated changes and potential effects	Incorporated measure
		<ul style="list-style-type: none"> Risks arising from interaction with the operational airport and its facilities 'Post Phase 1' (i.e. after Phase 1 construction has been completed), including communication and control of temporary changes, will be controlled by good working practices (e.g. set out in the CEMP). Construction risk management processes with risk reduction to ALARP and adoption of inherent safe design approaches for environmental major accidents and disaster hazards (e.g. set out in the CEMP). Management of Change Procedures to be developed within the Airport Safety and Environmental Management System to support Post Phase 1 construction. An Emergency Plan for construction will be developed which will layout the measures and responses, and roles and responsibilities in the event of an emergency. This will incorporate major accidents and disasters, and their response arrangements. A Waste Management Plan and procedures. Traffic controls and management with collision barriers will be provided where required. Historical site risk from previous activities (e.g. UXO and ground instability from tunnelling) minimised prior to construction: Site survey investigations and monitoring programmes will be undertaken to identify any that may be present. If any are found, a plan will be developed for their controlled removal. Secure site with restricted access. Protection to the runways and taxiways is considered in Chapter 10: Land Quality.
Land, surface and ground water (including particular species, designated sites and habitats)	Structural/equipment/civils collapse associated with the construction process, escalation from external or airport event, or natural disaster on the Proposed Development leading to hazardous substances entering the environment (land or water) as a potential pollutant.	<ul style="list-style-type: none"> The risks from construction activities will be mitigated by measures determined by a construction risk assessment in accordance with the Construction (Design and Management) Regulations 2015 and good working practices (e.g. set out in the CEMP). Adoption of inherent safe design principles³³ in the design plan. Construction risk management with risk reduction to ALARP for environmental major accidents and disasters. Risks arising from interaction with the operational airport and its facilities (Post Phase 1), including communication and control of temporary changes, will be controlled by good working practices (e.g. set out in the CEMP). The Emergency Plan will incorporate the identified major accidents and disasters and their response arrangements. Management of Change Procedures to be developed within the Airport Safety and Environmental Management System to support Post Phase 1 construction. This will include aerodrome security measures and controls. Traffic controls and management with collision barriers will be provided where required. Secure site with restricted access. Aerodrome security measures and controls will be in place, in line with EASA licensing requirement for the aerodrome. Historical site risk from previous activities (e.g. UXO and ground instability from tunnelling) minimised prior to construction: Site survey investigations and monitoring programmes will be undertaken to identify any that may be present. If any are found a plan will be developed for their controlled removal.
Populations and their buildings	Serious harm (multiple serious injuries or fatalities) to people on or off site during construction (e.g. fire, exposure to harmful	<ul style="list-style-type: none"> Equipment, storage and management measures as outlined for 'Land, Surface and Groundwater' above.

Potential receptor	Predicated changes and potential effects	Incorporated measure
	<p>substances, collision, structural collapse or transport risk).</p> <p>Exposure to natural disasters or escalation of external events (e.g. extreme weather, consequences of seismic events, third party fire, widespread pandemic or urban action) leading to injuries and loss of life.</p>	<ul style="list-style-type: none"> Flammable materials and dangerous chemicals will be stored in a secure location, contained and away from populations, and the public. Control of ignition for flammable materials as required under the Dangerous Substances & Explosive Atmospheres Regulations (DSEAR)³⁴. Management of major accident hazards through construction risk assessment, in accordance with Construction (Design and Management) Regulations 2015 and good working practices (e.g. set out in the Construction Safety Management Plan). This will include adoption of inherent safe design principles in the design plan and an Emergency Plan to cover construction activities. Risks arising from interaction with the operational airport and its facilities (Post Phase 1), including communication and control of temporary changes, will be controlled by good working practices (e.g. set out in the Construction Safety Management System/Plan). Management of Change Procedures to be developed within the Airport Safety and Environmental Management Systems and aerodrome security requirements to support Post Phase 1 construction. Construction risk management processes with risk reduction to ALARP and adoption of inherent safe design approaches for major accidents and disaster hazards to people (set out in the Construction Safety Management Plan). The Construction Emergency Plan will incorporate the identified major accidents and disasters, and their response arrangements. Traffic controls and management with collision barriers will be provided where required. Secure site with restricted access. Aerodrome security measures and controls will be in place, in line with EASA licensing requirements. Traffic controls and management. Transport and traffic management as outlined in Chapter 14: Traffic and Transport, incorporated measures. See also Chapter 8: Freshwater and Chapter 10: Land Quality, incorporated measures.
Populations and their buildings	Discovery of historical issues: potential explosion of UXO or ground instability (e.g. revealed tunnelling).	<ul style="list-style-type: none"> Historical site risk from previous activities (e.g. UXO and ground instability from tunnelling) minimised prior to construction: Site survey investigations and monitoring programmes will be undertaken to identify any that may be present. If any are found a plan will be developed for their controlled removal. Management of hazards through construction risk assessment in accordance with Construction (Design and Management) Regulations 2015 and good working practices in accordance with current guidelines. This will include adoption of inherent safe design principles in the design plan and an Emergency Plan to cover construction activities.
Designated Heritage Assets	Serious damage to designated heritage assets. Potential sources of major accident, including fire and excavation.	<ul style="list-style-type: none"> No SMs in proximity of major accidents associated with construction activities at the airport.

17.5.7

A summary of the measures that have been incorporated into the development proposals in order to avoid, reduce or compensate for potential adverse effects associated with major hazards and disasters during the operational phase is provided below in **Table 17-7**.

Table 17-7 Environmental measures incorporated into the operational phase of relevance to major hazards and disasters

Potential receptor	Predicated changes and potential effects	Incorporated measure
Land, surface and ground water (including particular species, designated sites and habitats)	<p>Large release of fuel, chemical or oil from the airport (including firewater and during refuelling) or other site event arising from disasters external major accidents leading to major accident damage.</p> <p>Fuel farm releases considered separately below for SPZ/Pegwell Bay.</p>	<ul style="list-style-type: none"> An outline site drainage strategy has been developed (see Chapter 3: Description of the Proposed Development) to capture, treat and discharge water in a controlled manner. The general mitigations associated with the groundwater and surface water are covered in Chapter 8: Freshwater Environment. Many of these are of benefit to major accident and disaster mitigation. Additional measures specific to the major accidents and disasters topic are outlined below: De-icer selected for use on the runways will not be classed as 'dangerous to the environment'. Post DCO engineering design industry good practice, including risk management, adoption of ALARP risk reduction and inherent safe design principles. The potential for major accidents and disasters will be included in the Emergency Plan and safety and environmental management systems. The design will minimise the storage and use of materials which are classed as 'dangerous to the environment'. The design will ensure these are stored in accordance with good practice as a minimum and that the layout of the airport and fuel farm is in line with relevant design standards and codes. Operational flights and vehicle movements will be in accordance with EASA licensing and industry good practice (including relevant EASA and CAA guidelines) to minimise the potential for collision or aircraft incident and subsequent release of fuel/chemical to the environment. Aerodrome security measures and controls will be in place, in line with EASA licensing requirements, including cyber security. Oils, chemicals and fuels will be stored in designated locations with specific measures to prevent leakage and release of their contents. All fuel storage of tanks will be appropriately designed to at least current standards or higher. Traffic and roadway management, with collision barriers in selected locations. UK government airport controls for imports and passengers. No plans for import of livestock. Airport access will be secure and controlled. Protection against adverse weather and natural phenomenon effects will include: <ul style="list-style-type: none"> Mitigation relating to drainage and containment as outlined in Chapter 8: Freshwater Environment. Many are applicable to protect against extreme weather events; Tank and equipment activities will allow for adverse weather events and natural phenomenon in their design basis; and Procedures will be in place to restrict and make safe operations in adverse weather and relevant natural phenomenon as part of the operational safety management system. These events will also be allowed for in the Emergency Plan.

Potential receptor	Predicated changes and potential effects	Incorporated measure
Land, surface and ground water (including particular species, designated sites and habitats)	Structural equipment or civils collapse at the airport associated with collision, impact, loss of integrity or outcome of extreme natural adverse phenomena on the Proposed Development exposing the SPZ to damage or escalating to release of significant ecotoxic material with potential for entry into Pegwell Bay.	<ul style="list-style-type: none"> Post DCO engineering design industry good practise, including risk management, adoption of ALARP risk reduction and inherent safe design principles. The potential for major accidents and disasters will be included in the Emergency Plan and safety and environmental management systems. Traffic and roadway management, with collision barriers in selected locations. Operational flights and vehicle movements will be in accordance with EASA licensing and industry good practice (including relevant EASA and CAA guidelines) to minimise the potential for collision or aircraft incident and subsequent release of fuel/chemical to the environment. Aerodrome security measures and controls will be in place, in line with EASA licensing requirements, including cyber security. Buildings to be constructed to building and fire safety regulatory requirements and current good practice. The potential for major accidents and disasters will be included in the Emergency Plan and safety or environmental management systems. Historical site risk from previous activities (e.g. UXO and ground instability from tunnelling) minimised prior to construction: Site survey investigations and monitoring programmes will be undertaken to identify any that may be present. If any are found a plan will be developed for their controlled removal. Secure site with restricted access.
Groundwater/SPZ/drinking water sources	Large leakage from fuel storage tanks, tankers or contaminated firewater, arising from natural disaster, external major accidents or site event at the fuel farm, enters the groundwater and leads to major accident damage.	<ul style="list-style-type: none"> The general mitigations associated with the groundwater and surface water are covered in Chapter 8: Freshwater Environment. Several of these relate to tank farm design and its drainage. The information provided below highlights aspects of specific relevance to major accidents and disasters which are not addressed in other topics. All fuel storage tanks on the fuel farm will be appropriately designed to at least current standards or higher (e.g. double skinned, bunded etc.), including HSG 176 (Storage of flammable liquids in tanks)²⁸, EI 1540 (Design, construction, commissioning, maintenance and testing of aviation fuelling facilities)²⁹, CIRIA C736 (Containment Systems for the Prevention of Pollution)³⁰, EI 2015 Guidelines on Environmental Management for Facilities Storing Bulk Quantities of Petroleum³¹, Petroleum Products and Other Fuels and HSE PSLG Buncefield recommendations³². Post DCO Engineering design industry good practise, including risk management, adoption ALARP risk reduction and inherent safe design principles. The potential for major accidents and disasters will be included in the Emergency Plan and safety and environmental management systems. Tank and associated equipment will include leak detection, process interlocks and mechanical devices. Traffic and roadway management. Collision protection will be provided in key areas and traffic control will exist on site. Site access will be secure and controlled. Aerodrome security measures and controls will be in place, in line with EASA licensing requirements, including cyber security. Firefighting foam selected for use on the tank farm will not be classed as 'dangerous to the environment'.

Potential receptor	Predicated changes and potential effects	Incorporated measure
		<ul style="list-style-type: none"> Climate change will be allowed for in the design basis. The design will minimise the storage and use of materials which are dangerous to the environment. The design will ensure that where these are stored, they are stored in accordance with industry good practice (e.g. relevant guidance referred to in Table 17-2 and elsewhere in Chapter 8: Freshwater Environment). Operational flights and vehicle movements will be in accordance with EASA licensing and industry good practice (including relevant EASA and CAA guidelines) to minimise the potential for collision or aircraft incident leading to loss of material harmful to the environment (e.g. aircraft fuel tank or fuel farm tank failure). This will include security and cyber security risk measures. Tankers within the local public road network are considered in Chapter 14: Traffic and Transport. The nature of vehicles and tankers is similar to those already experienced in the local network. Collisions leading to release of fuel would be dealt with by means of the normal police response. Tanker Driver would be ADR qualified (i.e. qualified to drive dangerous goods under the European Agreement concerning the International Carriage of Dangerous Goods by Road) drivers and familiar with the transport of hazardous material. Failure during adverse weather will include: <ul style="list-style-type: none"> Mitigations relating to drainage and containment as outlined in Chapter 8: Freshwater Environment and above under groundwater. Many are applicable to protect against extreme weather events; Tank and equipment activities will allow for adverse weather events in their design basis; and Procedures will be in place to restrict and make safe operations in adverse weather as part of the operational safety management system. These events will also be allowed for in the Emergency Plan.
Pegwell Bay and associated designated sites	Large release of substances dangerous to the environment which leads to a potential major accident at the receptor arising from natural disasters, escalation at the airport from a man-made external event, or major accidents at the site (airport or tank farm).	<ul style="list-style-type: none"> The design of the tanks, equipment, layout, containment and drainage systems (throughout the airport and tank farm) and their operation will be as described above under 'groundwater' and are therefore not repeated here. Mitigation measures relating to the Pegwell Bay outfall and the associated pipeline are addressed in Chapter 8: Freshwater Environment. Post DCO Engineering design industry good practice, including risk management, adoption of ALARP risk reduction and inherent safe design principles. The potential for major accidents and disasters will be included in the Emergency Plan and safety/environmental management systems. Tankers while on the local public road network are considered in Chapter 14: Traffic and Transport. The nature of vehicles and tankers that will be required for the airport is similar to those already in use on the local network. Collisions leading to release of fuel cargo would be dealt with by means of the normal police response. Tanker Driver would be ADR drivers, familiar with the transport of hazardous material and operating in line with the Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009.

Potential receptor	Predicated changes and potential effects	Incorporated measure
Designated heritage assets including Historic Buildings, SMs and Conservation Areas.	Major accident or disaster damage to designated heritage arising from site operations.	<ul style="list-style-type: none"> The Emergency Plan will allow for protection of heritage sites where required. Operational flights will be in accordance with EASA licensing and industry good practice (including relevant EASA and CAA guidelines) to minimise the potential for collision or aircraft incident.
Populations or occupied buildings	<p>Large fire/explosion due to release and ignition of substantial aviation fuel (Jet A1 and Avgas) or other flammable material, either at the fuel farm or on the airport site leading to injuries and loss of life.</p> <p>Aircraft related disasters.</p> <p>Structural events or misadventure associated with buildings, airport services/infrastructure, or attenuation ponds leading to injuries and loss of life.</p> <p>Collision/impact leading to injuries and loss of life.</p> <p>Airport users and workers exposed to natural disasters or escalation of external events (e.g. extreme weather, consequences of seismic events, third party fire, widespread pandemic or urban action) leading to injuries and loss of life.</p>	<ul style="list-style-type: none"> The design of the tanks, equipment, containment and drainage systems, and their operation will be as described above under 'groundwater' (above, in this table) and are therefore not repeated here. The design will include risk assessment and be developed in line with process safety standards, and the requirements of the Management of Health and Safety at Work Regulations. This will include site layout and design to reduce risk to public and workers to ALARP. The potential for major accidents and disasters will be included in the Emergency Plan and operational safety/environmental management systems. Ignition sources at the site will be controlled in areas where flammable atmospheres may be present in the event of a release in line with DSEAR regulations. Layout and equipment design will consider measures to minimise the potential for vapour cloud explosions (e.g. to minimise congestion and confinement). The design will minimise the storage of materials which are flammable or have the potential to lead to serious damage to populations. The design will ensure that where storage of such materials is necessary, they are stored and managed in accordance with good practice (e.g. relevant guidance referred to in Table 17-2 and elsewhere in Chapter 8: Freshwater Environment) as a minimum and that the layout of the airport and fuel farm allows for sufficient segregation from populated areas to control risk in accordance with HSE requirements. Operational flights and vehicle movements will be in accordance with EASA licensing and relevant EASA/CAA guidelines to minimise the potential for collision or aircraft incident leading to injury or damage to property. Aerodrome security measures and controls will be in place, in line with EASA licensing requirements, including cyber security. EASA licensing and industry good practice (including relevant EASA and CAA guidelines) for airside access, security and operational controls. Collision protection (e.g. barriers) will be provided in key areas and traffic control will be implemented at the airport to minimise potential for collision with equipment containing flammable or harmful materials, or impact with people. Historical site risk from previous activities (e.g. UXO and ground instability from tunnelling) minimised prior to construction: Site survey investigations and monitoring programmes will be undertaken to identify any that may be present. If any are found a plan will be developed for their controlled removal. Buildings to be constructed to building and fire safety regulatory requirements and current good practice. The potential for major accidents and disasters will be included in the Emergency Plan and safety/environmental management systems. UK government airport controls for imports and passengers.

Potential receptor	Predicated changes and potential effects	Incorporated measure
		<ul style="list-style-type: none"> Tankers and vehicles offsite within the local public network are considered in Chapter 14: Traffic and Transport. The nature of vehicles and tankers is similar to those already experienced in the local network. Collisions leading to injury would be dealt with by means of the normal police response. Tanker Driver would be ADR drivers and familiar with the transport of hazardous material.

17.6 Scope of the assessment

17.6.1 This section sets out information on:

- ▶ Identification of potential sources of major accident and disaster that could theoretically be associated with the development;
- ▶ Identification of potential receptors that could be affected by the development; and
- ▶ The potential effects on identified receptors from major accidents and disasters that could be associated with the Proposed Development.

17.6.2 The scope of assessment has been informed by:

- ▶ Other chapters, principally **Chapter 7: Biodiversity**, **Chapter 8: Freshwater Environment**, **Chapter 9: Historic Environment**, **Chapter 10: Land Quality**, **Chapter 14: Traffic and Transport**, **Chapter 16: Climate Change** and their assessments; and
- ▶ The finalised Proposed Development design (**Chapter 3: Description of the Proposed Development**).

Approach to identifying receptors

17.6.3 The identification of receptors is based on relevant guidance and the professional judgement of a qualified technical specialist. It is reasonable to assume that some potential receptors will not experience significant effects. This the result of tried and trusted mitigation measures that have been incorporated into the Proposed Development (see **Section 17.5**).

17.6.4 The following considerations were taken into account in identifying potential receptors:

- ▶ The extent and severity to which the receptor could be impacted by changes that are expected to be associated with the Proposed Development;
- ▶ The magnitude, duration, likelihood and other characteristics of the effects;
- ▶ The importance of the receptor locally, regionally, nationally and internationally; and
- ▶ Relevant best practice and guidance where specialist methodologies have been developed as detailed below.

17.6.5 Major accidents and disasters are by their nature of very high magnitude and are 'unplanned' (the realised effects are not part of the intended design, construction or operation). The notion of significant effects for major accidents and disasters focusses on the significance of the risk: i.e. magnitude of the event (if it was realised), sensitivity of the receptor and likelihood, all combined.

17.6.6 A significant effect from major accidents and disasters associated with the development is one which would result in the following, with a likelihood that the effect is considered intolerable to general society:

- ▶ Serious damage to human populations. This includes harm which would be considered substantial i.e. death(s), multiple serious injuries or a substantial number requiring medical attention; and
- ▶ Serious damage to the environment i.e. death(s) or adverse effects on local populations of species or organisms (with lower thresholds for high-value or protected species), contamination of drinking water supplies, contamination of ground or groundwater or harm to environmental receptors in line with other UK Major Accident regulations measures of harm.

17.6.7 A significant effect could include both immediate and delayed effects. An immediate effect would be one that is self-evident at the time of the event (e.g. fire damage, injury). A delayed effect is one which becomes evident only after time (e.g. loss of feeding ground leading to a change in the ecosystem).

Inter-related effects

17.6.8 For both construction and operation phases, this Chapter inherently takes account of relevant sources and receptors discussed in other topic chapters to inform the analysis. There are therefore no other inter-related effects arising from interactions with other topic Chapters, beyond those already considered in the primary major accident and disaster assessment below.

17.6.9 Specifically the assessment has referenced and accounted for inter-related effects related to:

- ▶ **Chapter 7: Biodiversity;**
- ▶ **Chapter 8: Freshwater Environment;**
- ▶ **Chapter 9: Historic Environment;**
- ▶ **Chapter 10: Land Quality;**
- ▶ **Chapter 14: Transport and Transportation;** and
- ▶ **Chapter 16: Climate Change.**

17.6.10 For the following chapters, the potential for inter-related effects were reviewed for relevance to major accidents and disasters, but none were identified of significance.

- ▶ **Chapter 6: Air Quality;**
- ▶ **Chapter 11: Landscape and Visual Impact;**
- ▶ **Chapter 12: Noise and Vibration;**
- ▶ **Chapter 13: Socio economics;** and
- ▶ **Chapter 15: Health and Wellbeing.**

Cumulative effects

17.6.11 Potential for cumulative effects is provided through an assessment in **Chapter 18: Cumulative Effects** and includes potential cumulative effects of the Proposed Development together with other identified major development proposals that were scoped into the assessment.

Potential receptors

17.6.12 The identification of receptors is based on relevant guidance, the methodology outlined above and the findings of relevant studies performed and documented in other topic chapters.

17.6.13 Those chapters of relevance to this Chapter are:

- ▶ **Chapter 7: Biodiversity;**

- ▶ **Chapter 8: Freshwater Environment;**
- ▶ **Chapter 9: Historic Environment;**
- ▶ **Chapter 10: Land Quality;**
- ▶ **Chapter 14: Traffic and Transportation; and**
- ▶ **Chapter 16: Climate Change.**

17.6.14 **Table 17-8** provides a summary of key receptors within the 1km land, 1km groundwater, 10km surface water study area and the flight swathe.

17.6.15 Sensitivity of receptor relates to the intrinsic value and/or sensitivity of receptors, locally, regionally, nationally and internationally. For major accidents and disasters it is an important factor embedded implicitly within the severity of harm and duration criteria to establish their threshold levels and scaling factors. An assessment of sensitivity in relation to major accidents and disasters is provided for information in **Table 17-8** for each key receptor, based on expert judgement (rather than from the published guidance and criteria, since it is not explicitly stated therein). Sensitivity of the affected receptor is assessed on a scale of very high, high, medium, and low.

Table 17-8 Potential receptors affected by the Proposed Development

Receptor	Location	Receptor sensitivity to major accident and disaster (for information only)	Summary of evidence
Human populations	Onsite	Very high	<p>The airport will include people visiting and working at the airport (during construction and operation), and during aircraft operations.</p> <p>The above populations could theoretically be exposed to a release of fuel which is ignited, handling or exposure to harmful substances, an aircraft incident, structural/equipment failure and vehicle collision.</p> <p>They may also be exposed to natural phenomena such as flooding, seismic activity, other extreme weather events such as hurricanes and external events caused by third party activity outside of the site.</p> <p>Historic activities at the airport may mean that historic hazards may be revealed exposing the airport population to injury. These may include UXO, chemical exposure, or ground instability.</p> <p>Changes to the site operations may change the risk to these populations, and introduce new populations to the site.</p>

Receptor	Location	Receptor sensitivity to major accident and disaster (for information only)	Summary of evidence
Human populations	Offsite	Very high	<p>Major towns are outside the 1km land study area. However, there are a low number of smaller settlements, houses and commercial premises within 1km of the RLB boundary. A small number of these are in relatively close proximity to the airport.</p> <p>Users of the local road network may also use roads local to the airport and around its perimeter.</p> <p>There could be localised effects associated with a release of fuel which is ignited, exposure to harmful materials, an aircraft incident, and structural/equipment failure or vehicle collision. There may also be effects such as natural phenomena (flooding, seismic activity and other extreme weather events such as hurricanes) initiating events at the development which subsequently escalate offsite.</p> <p>Changes to the site operation may change the exposure profile of these populations.</p> <p>There may also be potential for an aircraft incident (e.g. on approach and landing). Populations potentially involved in such events (where under the control of Manston tower) are also considered where within the flight path design swathe. This would include larger settlements of Ramsgate, Whitstable, Herne Bay, Kingsdown and Seasalter, as well as villages within the swathe. These areas include coastal resorts, schools, hospitals and recreational buildings. These areas could be exposed to air incidents. It would also include passengers and crew of the flight.</p>
Biodiversity	On site and within vicinity	Medium/Low	<p>These are fully considered in Chapter 3: Description of the Proposed Development.</p> <p>While ecological receptors use the Proposed Development site, none are currently anticipated to be of regional or national significance based on studies to date.</p> <p>No rare fauna is anticipated on the development site. The prevalent land type is hard standing and mown grass.</p>
Biodiversity	Pegwell and Bay/Sandwich Bay	Very High	<p>Ecological receptors are intrinsic to the designation of sites at Pegwell Bay and Sandwich Bay and include:</p> <ul style="list-style-type: none"> • Birds (waders and wildfowl); • Herbaceous vegetation and dunes; • Fish; • Insects, crustaceans and molluscs, worms and beetles; • Rare and scarce marine vegetation, marine algae, saltmarsh plants etc.; • Marine mammals; and • Reefs. <p>Changes to the site operation may introduce new or larger quantities of substances which could be hazardous to the environment and could introduce new pathways to the coastal and marine receptors through changes in the drainage system and its capacity needs.</p> <p>The area could also be exposed to air incidents.</p>

Receptor	Location	Receptor sensitivity to major accident and disaster (for information only)	Summary of evidence
Biodiversity	Flight swathe land receptors Stodmarsh NNR/Swale NNR/Preston Marshes/East Blean Woods/Blean Woods	Very High/High	<p>Ecological receptors are intrinsic to the designation of sites. These include:</p> <ul style="list-style-type: none"> • Mammals, birds and invertebrates; • Vegetation and scarce habitats; • Insects, crustaceans and molluscs, worms and beetles; and • Rare and scarce plant and animal species. <p>The locations are outside of the 1km study bound, but within the flight swathe.</p> <p>The area could also be exposed to air incidents.</p>
Coastal and marine designation sites Pegwell and Sandwich Bay	1.5km to 3.5km	Very High	<p>The north coast of the Isle of Thanet, located approximately 3.5km north of the site, is designated as a SSSI, SAC and SPA and Ramsar site. In closer proximity to the Proposed Development is Sandwich and Pegwell Bay, located 1.5km south east. This bay is also designated as a NNR, SSSI, SAC, SPA and Ramsar site.</p> <p>The proposed Manston Airport development site is within associated SSSI risk zonesⁱⁱⁱ.</p> <p>Changes to the site operation may introduce new or larger quantities of substances which could be hazardous to the environment and could introduce new pathways to the coastal and marine receptors through drainage system modifications and its capacity needs.</p> <p>The area could also be exposed to air incidents.</p>
SPZ, Southern Water Public Water supply sources	<0.5km	Very High	<p>An adit, associated with the SW Lord of the Manor Source, lies under the site boundary. The associated SPZ1 is also partially within the site boundary. Further information is provided in Chapter 8: Freshwater Environment.</p> <p>Changes to the site operation may introduce new or larger quantities of substances which could be hazardous to the environment and could introduce new pathways to the site and drainage modifications and its capacity needs.</p>
Other Groundwater bodies and Abstractions		Medium	These are addressed in Chapter 8: Freshwater Environment

ⁱⁱⁱ Zones around each SSSI site (the extent of which reflects the sensitivities of the features for which the site is notified) that indicate the extent beyond the SSSI where development proposals may still have adverse impacts on the SSSI.

Receptor	Location	Receptor sensitivity to major accident and disaster (for information only)	Summary of evidence
Other Land based NNR, SSSI, SAC, SPA, Ramsar and designated sites		Very High/High	<p>There are a number of designated sites outside of the 1km study bound for land based receptors, but within the flight swathe. These include:</p> <ul style="list-style-type: none"> Preston Marshes, located approximately 8.5km south west from the site. This area is designated a SSSI site; Stodmarsh NNR, located 8km south west from the site. This area is designated a NNR, SSSI, SAC, SPA and Ramsar site; The Swale NNR, located approximately 23km west from the site. This area is designated a SSSI, SPA and Ramsar site; East Blean Woods NNR, located approximately 12km east from the site. This area is designated a NNR and SSSI site; and Blean Woods NNR, located approximately 20km south west from the site. This area is a designated NNR and SAC site. <p>These sites may be exposed to an air incident.</p>
Monkton and Minster Marshes (River) Water Framework Directive (WFD) surface water body and downstream River Stour WFD Transitional water body.	Underlies the southern portion of the site, around the runway.	High	These are addressed in Chapter 8: Freshwater Environment .
Historic Environment	Within site and in the vicinity of the site (within 1km)	SM High	<p>There are no WHS within the study area.</p> <p>There are two SMs within the 1km study area. These are fully described in Chapter 9: Historic Environment and include:</p> <ul style="list-style-type: none"> Anglo-Saxon Cemetery south of Ozengell Grange, located 100m to the east of the site; and Enclosure and ring ditches sited 180m east-northeast of Minster Laundry. <p>There are no Grade I listed buildings within the site or the 1km study area but there are five within the flight swathe.</p> <p>There are Grade II listed buildings surrounding the site within the 1km study area but these are not relevant to major accidents and disasters.</p> <p>There are 6 SMs located between 2 and 30km of the site.</p> <p>Introduction of chemicals and flammable quantities of fuels, structural/equipment failure, or aircraft/vehicle incident could lead to the damage of any features in close proximity of the site.</p> <p>Air incidents may lead to damage to any impacted features within the flight design swathe.</p>

- 17.6.16 There is also potential for previously unrecorded features and receptors to be present at the Proposed Development site. These will be examined further on completion of site survey work (undertaken as part of the historic environment, freshwater, land use and biodiversity topics considered in other chapters).

Spatial and temporal scope

- 17.6.17 The spatial scope comprises the 1km study area for land, 1km study area for groundwater receptors, 10km study area (downstream) for surface water receptors and receptors within the flight design swathe. Since there is no surface water flowing over the site, surface water receptors are those which receive site drainage and the WFD surface water body which the site lies partially within.
- 17.6.18 The temporal scope is detailed below:
- ▶ The assessment of the construction phase effects from the construction phases is outlined in **Chapter 3: Description of the Proposed Development**. Where there are different potential effects from each construction phase these are outlined and each assessed separately;
 - ▶ Operational effects are based on Year 20 after the start of operations, by which time the Airport will have reached its operational peak (see **Chapter 3: Description of the Proposed Development** for further detail); and
 - ▶ The Outline Strategy allows for climate change for an airport lifespan of nominally 'the 2050s'.
- 17.6.19 Aircraft accidents which impact directly upon the Proposed Development are considered. Aircraft which are either departing from or en-route to Manston are not considered where they are either outside of Manston control or outside the flight design swathe. Phases of flight are excluded where either the consequences do not impact upon the Proposed Development or its study area directly or the cause is not directly attributable to the Proposed Development. For clarity, these are defined using terminology defined by Commercial Aviation Safety Team and the International Civil Aviation Organisation's (ICAO) Common Taxonomy Team 2013.
- 17.6.20 In simple terms, aircraft under the control of Manston tower, within the flight swathe or on the ground at Manston are considered to be within the scope of the major accident and disaster assessment. Departing aircraft that have completed their initial climb, or aircraft who are flying to Manston but are not yet on approach, are not considered to be within the bounds of the assessment. Vehicles and tankers are considered for the purposes of the major accident and disaster assessment where they are within the development bounds (e.g. site roads, vehicular routes and parking areas), or on the perimeter road.

Table 17-9 Phases of flight to be considered

Flight Phase	Included	Reasoning or limitations
Standing (STD)	Yes	If departing from Manston.
Pushback/Towing (PBT)	Yes	If departing from Manston.
Taxi(TXI)	Yes	If departing from Manston.
Take off(TOF)	Yes	If departing from Manston.
Initial Climb (ICL)	Yes	If departing from Manston.
En route (ENR)	No	Except aircraft intending to land at Manston within a holding pattern while in the control of Manston tower.
Manoeuvring (MNV)	No	Not anticipated at Manston.

Flight Phase	Included	Reasoning or limitations
Approach	Yes	If landing at Manston.
Landing (LDG)	Yes	If landing at Manston.
Emergency descent (EMG)	Yes	Only if it occurs when under the control of Manston tower during approach, take-off or landing.
Uncontrolled descent (UND)	No	Except if it occurs when the aircraft is in the process of landing or taking off from Manston airport under the control of Manston tower.
Post-impact (PIM)	No	Not an expected flight stage. Used primarily in incident reporting.
Unknown (UNK)	No	Not a definable flight stage. Used primarily in incident reporting.

17.7 Assessment methodology

Methodology for predicted effects

- 17.7.1 As the requirement for major accidents and disasters in EIA is new, significant guidance on the assessment of major accidents and disasters within the context of EIA has yet to be published in the UK. Two clear principles have however emerged from existing technical and EIA guidance. These have been adopted in the methodology used here; firstly, the notion of proportionality and secondly, the established principle that only those effects likely to be significant need to be assessed within the EIA.
- 17.7.2 The approach that has been adopted is aligned to recent European guidance made available by the EC³⁵. The context of the guidance for major accidents and disasters is that the scope covers those which could impede the Proposed Development's activities and objectives and may have adverse effects to receptors. The focus of the assessment is therefore to recognise significant risk arising from major accidents and disasters and leading to potential significant environmental effects, thereby building resilience into the scheme and reducing the vulnerability of the Proposed Development.
- 17.7.3 Major accidents and disasters are by their nature of very high consequence (if they occur) and are 'unplanned' with the effects not part of the intended design, construction or operational intent. The assessment of significant effects for major accidents and disasters focusses on the risk significance, the combination of the severity of harm (if they were realised), sensitivity of the receptor and likelihood rather than the magnitude of the change and sensitivity of the receptor only.
- 17.7.4 Risk tolerability for major accidents and disasters in the UK focusses on eliminating intolerable risk, and to ensure, particularly at engineering design stages, that any residual risk, while small is further minimised where practicable.
- 17.7.5 This principle has been applied in the assessment here, with 'intolerable risk' interpreted as equivalent to 'significant adverse effects' to use EIA terminology for the purposes of consistency with other topic assessments considered in this ES.
- 17.7.6 A significant effect from major accidents and disasters is therefore one which would result in the following, with a likelihood that the effect is considered intolerable to general society, based on commonly accepted benchmarks for what is intolerable:

- ▶ Serious damage to human populations. This includes harm which would be considered substantial i.e. death(s), multiple serious injuries or a substantial number requiring medical attention; and
- ▶ Serious damage to the environment i.e. death(s) or adverse effects on local populations of species or organisms (with lower thresholds for high-value or protected species), contamination of drinking water supplies, contamination of ground or groundwater or harm to environmental receptors in line with other UK major accident regulations measures for damage.

17.7.7 The methodology adopted for the assessment is necessarily qualitative as the design is at planning stage. Post DCO consent and as the design advances through engineering design stages, additional risk assessments (qualitative and where necessary quantitative) will be undertaken as part of the routine design process, to account for all emerging and relevant engineering details in the evolving design scheme.

17.7.8 The assessment approach is to:

- ▶ Identify potential receptors;
- ▶ Identify potential major accidents and disasters relevant to the Proposed Development;
- ▶ Assess whether any credible pathways exist (i.e. the link between an event and a receptor);
- ▶ Qualitatively assess the harm/damage which could be caused to the receptor to;
 - ▶ Eliminate those effects which do not meet the minimum threshold of serious damage from a major accident/disaster; and, if the threshold is met; and
 - ▶ Estimate the magnitude of accidents and disasters (if they were realised), at the receptor;
- ▶ Qualitatively assess the likelihood of the effect, considering the range of impacts which may be associated with the source/initiator of an accident/disaster and taking into account the measures embedded in the Proposed Development which would reduce their occurrence and/or severity; and
- ▶ Establish whether significant (i.e. intolerable) effects from major accidents and disasters exists.

17.7.9 Occupational risks resulting from day to day activities which may affect one to two people (e.g. slips, trips and falls) and which are managed under the general obligations of the Health and Safety at Work Act are not generally recognised as a major accident. These are therefore excluded from the assessment.

17.7.10 Compliance with EASA licensing and relevant safety control under CAA/EASA guidance will be fundamental to the aircraft operation to ensure the safety of the aircraft, and its occupants, as well as populations on the ground. The safety of aircraft passengers and crew will be protected by these established relevant EASA/CAA controls. The assessment therefore considers these controls as an incorporated mitigation measure, and assesses passenger and crew risk on the basis that if Manston was not used, an alternative mode or location would be used by both employees and passengers.

Significance evaluation methodology

17.7.11 As noted in **Sections 17.7.3 to 17.7.5**, a significant effect for major accidents and disasters focusses on risk. This differs from the way in which many other topics are assessed. Typically, other topics examine effects that are considered likely to occur and therefore do not meet the thresholds required to be considered a major accident or a disaster.

17.7.12 This Chapter considers foreseeable but unplanned events with the effects not part of the intended design, construction or operational intent. These are typically by their nature highly infrequent, but are important considerations so that resilience against them can be built into a Proposed Development at planning stage, and to provide sufficient information for informed decisions to be made for planning purposes. Resilience is built by ensuring that high consequence events are

eliminated or, where elimination is not possible, reduced to such an extent the chance of them occurring is so small that they can be deemed not to be significant.

- 17.7.13 A range of options are available from which to benchmark environmental (non-human) major accident and disaster tolerability. One which is widely referenced in the UK (CDOIF³⁶) has been developed to support evaluation of establishments falling under the COMAH regulations 2015. These regulations are not considered to apply to the Proposed Development, based on current understanding of hazardous substances which may be present. However, aspects of the guidance relating to the thresholds for major accident and disaster damage, tolerability of risk and the level at which an accident would be considered intolerable (significant) are generally applicable³⁷. These aspects of the guidelines have been proportionately applied to reflect (in this case) the relatively low quantities of hazardous substances anticipated, the full range of theoretically relevant sources for major accidents and disaster, and the current development stage of the proposed scheme, where detailed design has not been carried out.
- 17.7.14 Risk tolerability for people is well established in the UK. The primary reference for this is HSE's R2P2³⁸. The CDOIF and R2P2 criteria have been used in this assessment to provide a consistent basis for the study against common benchmarks for major accidents and disasters applied across the UK. **Appendix 17.4** provides detail of the criteria used in this Chapter and its application.
- 17.7.15 The following factors are important in defining the criteria:
- ▶ Thresholds of major accidents and disasters are established from the following dimensions;
 - ▶ Severity of harm (a combination of extent and damage potential); and
 - ▶ Duration of harm (the recovery period).
 - ▶ Likelihood of the event occurring.
- 17.7.16 These combine to provide a measure of risk (i.e. the combination of the serious damage arising from a potential event and its likelihood of occurrence). The fact that the Proposed Development is currently in the planning stage means that the estimates are necessarily qualitative and based on by expert judgement informed by comparison against experience in similar industries and for similar developments, where practical.

Magnitude of change

- 17.7.17 The magnitude of change by which a major accident or disaster is identified is often very different from other topics considered in the ES. Magnitude of change within the context of major accidents and disasters is assessed from both the severity of the harm/damage, and the duration over which the receptor experiences that harm and recovers, allowing for mitigation.
- 17.7.18 Severity of major accident and disaster harm typically starts at the threshold of damage/harm which can be considered to constitute a major accident or disaster. The criteria for severity of harm is developed for a range of non-human receptor types (extracted directly from the CDOIF guidance) and further receptor types for human populations (established to align to HSE's R2P2). Severity of harm criteria is summarised in Table A17.4.1 of **Appendix 17.4**.
- 17.7.19 Four categories of harm severity are considered in **Table 17-10**:
- ▶ **Not Significant:** This level of harm is below the minimum threshold determined for a major accident or disaster in the CDOIF guidance and in R2P2. Consequently, although it has been included in the criteria for information, such events have not been taken forward into the assessment of significance because they do not meet the minimum level of damage to constitute major accidents or disasters as commonly understood from CDOIF guidance or by the HSE/EA in major hazards legislation (e.g. COMAH³⁹). The CDOIF guidance used the terminology of 'significant' for this severity of harm and defines it as a level of harm which might lead to significant pollution, but one which is not considered a major accident or disaster. While CDOIF guidance uses the term 'significant' for this, this is very different to how the term is used in EIA. Indeed, a significant pollution using the CDOIF definition, would not be 'significant' in

the context of EIA for major accident and disasters, and therefore this criterion term has been replaced by 'not significant' in **Table 17-10** and in **Appendix 17.4** to avoid confusion;

- **Severe, Major, Catastrophic:** These represent increasing levels of damage or harm to populations or environmental receptors.

- 17.7.20 For population receptors, these have been calibrated to align with HSE's R2P2 societal risk measures. For non-human receptors these are taken directly from CDOIF.
- 17.7.21 The environmental (non-human population) severity of harm criteria has been directly extracted from that of CDOIF which sets a maximum or minimum harm ranking for some receptors. **Table A17.4.1 of Appendix 17.4** defines how the four severity of harm criteria levels relate to each receptor type. Each of which have been assigned a level of sensitivity for this assessment.
- 17.7.22 For human receptor types, a similar precautionary concept is adopted, although the most onerous criteria is applied to protect against public harm. This is in line with general risk concepts applied by the HSE. The duration of harm which might also be considered as the recovery period is also a factor in establishing criteria for the magnitude of change relating to major accidents and disasters. This criteria is provided in **Table A17.4.2 of Appendix 17.4**.
- 17.7.23 Four categories of duration are considered: short term, medium term, long term and very long term:
- For non-human receptor types, the criteria is taken directly from the CDOIF guidance. In general terms a receptor which is able to recover quickly from an event is considered to have suffered a level of harm which is more easily tolerated than one that does not recover, or recovers only after a very long time. This concept is recognised in the duration criteria, which takes account for the ability of the receptor to naturally recover and the importance given to the receptor by society (i.e. its sensitivity). Duration criteria therefore differs by receptor type, and what is considered short term for one receptor type is not the same as that of another. In the assessment use has been made of guidance provided by the EI⁴⁰, for appropriate recovery times of different receptors following exposure to various hazardous substances; and
 - For human receptors, assignment of duration is not strictly appropriate and therefore while they are included in **Table A17.4.2 of Appendix 17.4** the assigned values are based on the number of people affected to provide appropriate alignment to HSE R2P2 concepts.
- 17.7.24 Receptor sensitivity relates to the intrinsic value and/or sensitivity of receptors. It is an important factor for the major accident and disaster topic, but one which is embedded implicitly within the severity of harm and duration of harm criteria to establish their threshold levels and scaling factors. It does not therefore separately form part of the magnitude matrix dimensions, since it has already been factored in at an earlier stage. To assist understanding, an indication of harm sensitivity is however provided for each key receptor in **Table 17-8**. This is based on expert judgement (rather than from published guidance) and is provided for information only.
- 17.7.25 The severity and duration criteria combine to establish the magnitude of change. The details are summarised in the matrix shown in **Table 7-10**, with magnitude of change determined using terminology that is specific to this Chapter, i.e: Very High (red); High (light red); Medium (yellow); Low (green); to Not Significant (grey).

Table 17-10 Magnitude of change matrix

Severity of Harm	Catastrophic		High	V High	V High
	Major		Medium	High	V High
	Severe		Low	Medium	High
	Not Significant		MA&D not Significant		
Duration of harm		Short	Medium	Long	Very long

Determination of Significance

- 17.7.26 Guidance provided by the EC³⁵ highlights that the context for inclusion of major accidents and disasters in EIA is to ensure that adequate focus is given to the provisions for events leading to significant risk with an objective of building resilience into a development against such effects. The bar for what may be considered significant (i.e. what can be considered to be intolerable) therefore includes much less frequent effects than are addressed in many other topic chapters. Lesser magnitude events are generally tolerated much more readily than those of higher magnitude.
- 17.7.27 Risk in the terminology of this assessment is a combination of magnitude of change and likelihood.
- 17.7.28 Risk tolerability for major accidents and disasters in the UK generally follows the 'ALARP' principle, where intolerable risk is eliminated, and to then examine any residual risk (particularly at engineering design stage), to reduce it even further where this is practicable.
- 17.7.29 This principle has been applied in the assessment here, with 'Intolerable risk' interpreted as 'Significant adverse effect' for EIA purposes.
- 17.7.30 The assessment applied expert judgement to identify risks that are Significant (Intolerable), once the mitigation is applied. The combination of likelihood with magnitude from **Table 17-10** in **Table 17-11** us to determine the major accident and disaster levels of risk, which can then be translated into EIA terminology to determine the levels of effect in EIA terms, which can be summarised as follows:
- ▶ **Major/moderate** (red in the matrix below) risk is considered to be Significant effects. This is risk which is classed as intolerable;
 - ▶ **Minor** (amber in the matrix below) risk is assessed to be Not Significant for the purposes of EIA. This means that while residual risk is not significant, it will still require further proportionate consideration at engineering design stage to ensure that the residual risks are ALARP; and
 - ▶ **Negligible** (green in the matrix below) residual risk is so low that is can be managed by compliance with general regulations and application of technical codes and standards, without the need for proportionate further consideration of major accidents and disasters or additional risk reduction measures.
- 17.7.31 The risk matrix is given in **Table 17-11**. The descriptors used for likelihood reflect the qualitative nature of the assessment which is necessary and appropriate at the pre-application stage. This acknowledges the iterative nature of the design process whereby a certain level of design is required for inclusion with the application with detailed design following the making of the order. The likelihoods described are relative to this 'major accident and disaster' scale of magnitude and are therefore in general much less likely than those covered in other chapters. The likelihood and risk reported is that above the baseline (i.e. the incremental likelihood and risk). This is the risk that can be attributes to the development directly or indirectly.
- 17.7.32 While qualitatively stated, the definition and classifications used for likelihood are designed to be compliant with HSE's R2P2 for societal risk, and CDOIF for environmental tolerability, if considered on a per effect basis rather than in terms of aggregated risk (i.e. the risk from all contributors to a receptor). Expert judgement has been used to establish the appropriate qualitative parameters for likelihood categorisation, with levels used ranging from '*incredible/highly improbable*' through to '*likely/possible*', for which a definition for each is provided in **Table 17-11**. These then provide an allocation of likelihood against magnitude to determine risk, which in turn is an approach that is consistent with major accident tolerability perceptions commonly applied elsewhere in the UK.
- 17.7.33 It is important to recognise that the magnitude levels referred to in **Table 17-11** are from **Table 17-10**. In general, they relate to a level of harm and damage starting at the highest level of effect addressed in other chapters.

Table 17-11 Major accident and disaster matrix

Magnitude of change (Table 7-10)	Likelihood			
	Incredible /Highly Improbable	Improbable	Very Unlikely	Likely/Possible
	Highly Improbable even in the very long term	Remote possibility at the development over its lifetime	Very unlikely/small possibility at the development over its lifetime	Reasonable likelihood/possibility at the development over its lifetime
Very High	Negligible/minor (Not Significant)	Moderate (Significant)	Major (Significant)	Major (Significant)
High	Minor (Not Significant)	Minor (Not Significant)	Moderate (Significant)	Major (Significant)
Medium	Negligible (Not Significant)	Minor (Not Significant)	Minor (Not Significant)	Moderate/major (Significant)
Low	Negligible (Not Significant)	Negligible (Not Significant)	Minor (Not Significant)	Minor/moderate (Significant)

17.8 Assessment of effects on groundwater, drinking water sources and aquifers

Construction phase effects

- 17.8.1 A full determination of effects, including source, potential causes, pathways and receptors, is provided in **Appendix 17.1**, for major accidents relating to construction activities, and **Appendix 17.3**, for those relating to disasters (natural phenomena) and external sources of man-made major accidents.
- 17.8.2 Phase 1 of construction will entail the largest volume of construction activity, including earthworks at the new apron area, and installation of the new drainage network. At this time the airport will not be operational for commercial freight or scheduled flights (a small number of Polar Helicopter flights may however continue in this period).
- 17.8.3 In phases 2 to 4 of construction, the airport will be operational. During this period, there is the potential for interaction between the airport structures, aircraft and support vehicles and the construction activities, which could cause loss of containment of hazardous material or fuel, with a small potential the potential for this to enter the ground and pollute the SPZ, or enter drainage routes.
- 17.8.4 The construction activities have the potential to make use of fuels and hazardous chemicals at the Proposed Development. If a substantial release of these occurs from the unlikely occurrence of generic failure, human error, handling error, impact, malicious acts and is not adequately contained, there may be the potential for these in the worst of cases to enter the ground and pollute the aquifer and the SPZ including SPZ1. Intrusive construction activities (e.g. excavation, piling and demolition) have the potential to cause disturbance to the ground and surfaces within the RLB of the Proposed Development.
- 17.8.5 Historical site use also indicates that UXO and civils (e.g. tunnels) may have been present at the site. There is therefore some possibility these could be revealed and lead to pollution to the SPZ, directly or indirectly.
- 17.8.6 Firewater runoff with contaminated water in the event of a large scale fire may also have the potential in some instances to contaminate groundwater or enter drainage pathways.
- 17.8.7 As with any site or activity, extreme adverse weather (e.g. hurricane) or external events (e.g. fires) should they occur can introduce damage to equipment, with consequential release of hazardous material to ground in some cases.

Mitigation

- 17.8.8 The Proposed Development specifically considers the vulnerability of key receptors such as the SPZ (and associated designated sites). It also includes measures specifically to support the

mitigation of major accidents and disasters. Key mitigations are outlined in **Appendix 17.1** and **Appendix 17.3**. These include:

- ▶ Construction planning for major accidents and disasters, including risk assessment, adoption of industry risk management practices (including 'ALARP' principles and Inherent Safe design approaches) and safe work practices;
- ▶ CEMP and Emergency Plan, to be developed with specific inclusion of major accident and disasters arising at both the construction site, and from its interaction with the operational airport (post Phase 1);
- ▶ An airport Safety and Environmental Management System and an Emergency Plan will be developed and specifically allow (through management of change procedures) for interaction with the construction activities in relation to major accidents and disasters. These will be appropriately updated to reflect significant changes to the operations as the phases of construction progress, and any temporary changes;
- ▶ Measures for minimisation, appropriate storage, containment, drainage and siting of all hazardous material, with preferential siting away from SPZ1;
- ▶ Firefighting strategy for use of foam which is not ecotoxic by the airport firefighters and design of the strategy to consider major accident implications of firefighting options for selection of appropriate strategies. Based on current understanding, the anticipated quantities of hazardous material stored or used on site is expected to be relatively low (i.e. below thresholds for hazardous substance consent or lower tier status under the Control of Major Accident Hazards Regulations);
- ▶ Geotechnical surveys in Phase 1, with agreement of the investigations and foundation techniques, including any piling, with Southern Water (SW) and the EA;
- ▶ Preconstruction inspection and surveys and ongoing monitoring for historic site issues, including UXO, residual chemicals and civils;
- ▶ A Security Plan will be developed to include site access and barriers, and aligned to airport security requirements; and
- ▶ Measures described in **Chapter 8: Freshwater Environment** for the protection of the aquifer.

17.8.9 It is concluded that a combination of these measures once implemented, construction good practice, conformance with the Construction, Design and Management (CDM) Regulations 2015, together with further consultation with SW and the EA will result in no significant effects to the groundwater receptors during construction.

Operational phase effects

17.8.10 A full determination of effects, including source, potential causes, pathways and receptors, is provided in **Appendix 17.2**, for major accidents relating to operational airport activities, and **Appendix 17.3**, for those relating to disasters (natural phenomena) and external sources of man-made major accidents.

17.8.11 The airport operations will involve use, storage (e.g. the fuel farm and use of other operational chemicals) and handling of hazardous chemicals and fuels. There is a small potential for these to be accidentally released and enter to ground and enter pathways to the SPZ if not adequately contained. Causes of such events could include events such as aircraft or vehicle collision, impact, human error, design/management failure or external events such as extreme adverse weather or third-party activities, including malicious acts.

17.8.12 The proposed airport fuel farm is located to the south east of the Proposed Development. The operation of the fuel farm will include delivery and storage of aviation fuels (JetA1 and to a lesser extent Avgas). There is the potential for these to be released to ground under similar circumstances to those indicated in paragraph 17.8.11.

- 17.8.13 Historical site use also indicates that ordnance and civils (e.g. tunnels) may have been present at the site. There is therefore some small possibility these could be revealed and lead to pollution to the SPZ, directly or indirectly or enter drainage pathways.
- 17.8.14 Firewater runoff with contaminated water in the event of a large scale fire may also have the potential in some instances to contaminate groundwater or enter drainage pathways.
- 17.8.15 As for construction, extreme adverse weather (e.g. hurricane) or external events (e.g. fires) have the potential to damage to equipment, with consequential release of hazardous material to ground or drainage pathways in some cases.

Mitigation

The design of the Proposed Development specifically considers the vulnerability of the groundwater aquifers and measures specifically designed to support the mitigation of major accidents and disasters.

- 17.8.16 Key mitigations are outlined in **Appendix 17.2** and **Appendix 17.3**. These include:
- ▶ Stringent requirements and standards under the EASA licensing, and design and operation in accordance with relevant CAA and EASA Guidelines. These provide a robust framework of management (e.g. competency, security and safety management) and engineering standards for the safe and secure operation of airports, relating to aircraft (both in the air and on the ground) and airside operations/activities, including ground handling;
 - ▶ Design processes for major accidents and disasters, including risk assessment, adoption of industry risk management practices (including 'ALARP' principles and Inherent Safe design approaches);
 - ▶ The fuel farm is where the highest volume of hazardous material (fuel) is located. Specific measures have been developed for this area, in consultation with the EA. Good practice industry standards for fuel storage and handling in design and operation will apply. For example, HSG 176 (Storage of flammable liquids in tanks), EI 1540 (Design, construction, commissioning, maintenance and testing of aviation fuelling facilities, CIRIA C736 (Containment Systems for the Prevention of Pollution), EI 2015 Guidelines on Environmental Management for Facilities Storing Bulk Quantities of Petroleum, Petroleum Products and Other Fuels and HSE PSLG Buncefield recommendations;
 - ▶ An airport Safety and Environmental Management System and an Emergency Plan will be developed and specifically allow (through management of change procedures) for normal operation and non-routine operations/activities (e.g. adverse weather, temporary changes and interaction with construction activities) in relation to major accidents and disasters;
 - ▶ A Security Plan will be developed to include aerodrome controls and access in line with EASA licensing requirements;
 - ▶ Airport firefighting strategy with specification for the use of foam by the airport fire fighters which is not ecotoxic and design of the strategy to consider major accident implications of firefighting options for selection of appropriate strategies;
 - ▶ Measures for minimisation, appropriate storage, containment, drainage and siting of all hazardous material, with preferential siting away from SPZ1;
 - ▶ Airport drainage strategy and extensive hardstanding, as outlined in **Chapter 3: Description of the Proposed Development** and **Chapter 8: Freshwater Environment**;
 - ▶ Inspection and maintenance management system for operational airport; and
 - ▶ Inspection and surveys (in construction), and airport procedures to remove and manage historical site issues, including UXO, residual chemicals and civils.

- 17.8.17 It is concluded that a combination of these measures once implemented, good practice, conformance with the relevant EASA licensing, EASA/CAA guidance and industry standard codes and practices, together with further consultation with SW and the EA will result in no significant effects to the groundwater receptors during operation.

17.9 Assessment of effects on surface water receptors

Construction phase effects

- 17.9.1 A full determination of effects, including source, pathways and receptors, is provided in **Appendix 17.1**, for major accidents relating to construction activities, and also **Appendix 17.3**.
- 17.9.2 The Phase 1 to 4 operations are as summarised in paragraph 17.8.1 to paragraph 17.8.3.
- 17.9.3 The construction activities have the potential to make use of fuels and hazardous chemicals. There may be the possibility that these could enter the drainage network and discharge from the Pegwell Bay outfall to the Sandwich and Pegwell Bay designated sites (Ramsar/SSSI/SAC/SPA) following dilution in the drainage network (and in the lagoons for drainage from the airside drainage network).
- 17.9.4 As outlined in paragraph 17.8.5 to paragraph 17.8.7 historic site use, adverse weather and firewater run off may also present sources of accidents and disasters in some worst case circumstances.

Mitigation

- 17.9.5 The Proposed Development specifically considers the vulnerability of key receptors such as Sandwich and Pegwell Bay (and associated designated sites). It also includes measures specifically to support the mitigation of major accidents and disasters. Key mitigations are outlined in **Appendix 17.1** and **Appendix 17.3**. These include:
- ▶ Measures as outlined in paragraph 17.8.8 in **Section 17.8**. These will include specific measures for Pegwell Bay outfall protection;
 - ▶ Drainage strategies will be developed for the capture and treatment of drainage onsite, in consultation with the EA; and
 - ▶ Measures for minimisation, appropriate storage, containment, drainage and siting of all hazardous material, with preferential siting away from drainage pathways to Pegwell Bay. Construction phase site discharge in construction Phase 1 will be contained on site and discharged to the site sewer network, following treatment by siltbusters or similar, or taken off-site. In construction Phases 2 - 4 it is envisaged that the site drainage network will be in place and discharges of treated clean water will be to Pegwell Bay (contaminated water and pollutant materials will be contained on site).
- 17.9.6 It is concluded that a combination of these measures once implemented, plus construction good practice, conformance with the CDM Regulations 2015, together with agreement of the detailed construction drainage strategy with the EA will result in no significant effects to the surface water receptors during construction.

Operational phase effects

- 17.9.7 A full determination of effects, including source, pathways and receptors, is provided in **Appendix 17.2**, for major accidents relating to operational airport activities, and **Appendix 17.3**, for those relating to disasters.
- 17.9.8 The airport operations will involve use, storage (e.g. the fuel farm and use of other operational chemicals) and handling of hazardous chemicals of fuels. There is a potential for these to be accidentally released via the drainage network to the Pegwell Bay outfall and the designated sites

of Sandwich and Pegwell Bay (Ramsar/SSSI//SAC/SPA). These could result from events such as aircraft or vehicle collision, impact, human error, design/management failure or external events such as extreme adverse weather or third-party activities.

- 17.9.9 The proposed airport fuel farm is located to the south east of the Proposed Development. This will include delivery and storage of aviation fuels (JetA1 and to a lesser extent Avgas). There is the potential for these to be released under similar circumstances to those indicated in paragraph 17.9.8 above.
- 17.9.10 In the event of an air incident, the surface water receptors have some potential to be affected, either directly through impact, or indirectly (for example if the aircraft incident involved collision with a fuel tank and subsequent discharge through drainage routes).
- 17.9.11 As outlined in paragraph 17.8.13 to paragraph 17.8.15 historic site use, adverse weather and firewater run off may also present sources of accidents and disasters in some worst case circumstances.

Mitigation

- 17.9.12 The design of the Proposed Development specifically considers the vulnerability of the surface water receptors, principally the Sandwich and Pegwell Bay designated sites, and measures specifically designed to support the mitigation of major accidents and disasters.
- 17.9.13 Key mitigations are outlined in **Appendix 17.2** and **Appendix 17.3**. These include:
- ▶ Measures as already outlined in paragraph 17.8.16 in **Section 17.8**. These will include specific measures for Pegwell Bay outfall protection; and
 - ▶ Airport drainage strategy and hardstanding, with active capture, treatment and retention onsite (as outlined in **Chapter 3: Description of the Proposed Development** and **Chapter 8: Freshwater Environment**). This will be developed for the capture and treatment of drainage onsite, in consultation with the EA.
- 17.9.14 It is concluded that a combination of these measures once implemented, good practice, conformance with the relevant EASA licensing, EASA/CAA guidance and industry standard codes and practices, together with further consultation with the EA will result in no significant effects to the surface water receptors during operation.

17.10 Assessment of effects on population receptors

Construction phase effects

- 17.10.1 A full determination of effects, including source, pathways and receptors, is provided in **Appendix 17.1**, for major accidents relating to construction activities, and **Appendix 17.3**, for those relating to disasters.
- 17.10.2 Phase 1 of construction will entail the largest volume of construction activity, including earthworks at the new apron area, and installation of the new drainage network. At this time the airport will not be operational for commercial freight or scheduled flights (a small number of Polar Helicopter flights may however continue in this period).
- 17.10.3 As with any construction site, there is the potential for injury and loss of life to both the construction workers and others in proximity, including in some circumstances airport users and members of the public. This could be through collision, impact, structural/civils collapse, exposure to harmful toxic substances, exposure to ignited flammable substances or high pressure equipment, human error, planning and management errors, or realisation of historical issues (e.g. UXO).
- 17.10.4 In Phases 2 to 4 of construction, the airport will be operational. During this period, and in addition to the above, there is the potential for interaction between the airport structures, aircraft and support

vehicles and the construction activities, which could cause injury or loss of life to construction populations, airport workers, aircraft crew and visitors to the airport.

- 17.10.5 As with any site or activity, extreme adverse weather (e.g. hurricane) or external events (e.g. fires) should they occur can introduce damage to equipment and structures, and may make worksites temporarily unsafe. In some cases, a consequence of these occurrences may be a release of hazardous material, fires and flying debris. People at the airport and construction site, or in close proximity to the Proposed Development could be injured with potential loss of life.
- 17.10.6 Transportation of equipment, people and fuel outside of the airport is addressed in **Chapter 14: Traffic and Transport**. There is potential for collision of construction vehicles and worker vehicles with road users and pedestrians.
- 17.10.7 The Proposed Development and its construction workers may be vulnerable to widespread external health issues (e.g. pandemic) or external factors outlined in the Kent Community Register. Injury or loss of life may result from these situations, but the impact would generally be expected to be widespread and not specific to or caused by the airport.

Mitigation

- 17.10.8 The protection of populations during construction is addressed in legislation under the obligations of the Health and Safety at Work Act and regulated under a range of legislation including the CDM Regulations 2015, the Management of Health and Safety at Work Regulations, the Control of Substances Hazardous to Health Regulations (COSHH) 2002.
- 17.10.9 Key mitigations are outlined in **Appendix 17.1** and **Appendix 17.3** for effects on people during construction. These include:
- ▶ Measures as already outlined in paragraph 17.8.8 in **Section 17.8**. These will include specific measures for protection of people from harm;
 - ▶ Construction Safety Management plan/system, safe working practices, method statements, site rules and Emergency Plan to be developed with specific inclusion of major accident and disasters arising at both the construction site and from its interaction with the operational airport (post Phase 1);
 - ▶ The Airport Safety Management System and an Emergency Plan once developed will include provision for the management of change (procedures and risk management requirements to reduce risk to 'ALARP'). This will be the vehicle under which interaction with the construction activities in relation to major accidents and disasters is managed. Significant changes to the operations as the phases of construction progress, and any temporary changes will be allowed for in the management of change process;
 - ▶ Preconstruction inspection and surveys and ongoing monitoring for historic site issues, including UXO, residual chemicals and civils;
 - ▶ Site traffic and roadway strategy will be developed for construction; and
 - ▶ Risk measures/procedures including major accidents and disasters risk assessment and personal protective equipment in line with risk assessment, site procedures and COSHH requirements.
- 17.10.10 It is concluded that a combination of these measures once implemented, construction good practice, conformance with the CDM Regulations 2015 and the Health and Safety at Work Act will result in no significant effects to population receptors during construction.

Operational phase effects

- 17.10.11 A full determination of effects, including source, pathways and receptors, is provided in **Appendix 17.2**, for major accidents relating to operational airport activities, and **Appendix 17.3**, for those relating to disasters (natural phenomena) and external sources of man-made major accidents.

- 17.10.12 Aircraft flights, associated vehicle movements, mobile and fixed equipment and use and storage of chemicals and fuels for operational purposes have the potential for harm to people resulting in injury or loss of life. There is the potential for injury and loss of life to airport workers, aircraft users/crew and others in proximity, including in some circumstances members of the public close to the airport or affected by an air incident. This could be through aircraft incident, collision, impact, structural/civils collapse, exposure to harmful toxic substances, exposure to ignited flammable substances or high pressure equipment, human error, planning and management errors, or realisation of historical issues (e.g. UXO).
- 17.10.13 A small number of houses are close to the runway, including towards the runway end. While aircraft operations are controlled and their risk minimised in line with EASA licensing requirements and CAA CAP guidelines, worst case aircraft incidents could potentially affect the houses leading to injury or loss of life in the worst case.
- 17.10.14 The proposed airport fuel farm is located to the south east of the Proposed Development. This will include delivery and storage of aviation fuels (JetA1 and to a lesser extent Avgas). There is the potential for these fuels to be released under similar circumstances to those indicated in paragraph 17.10.12, and be ignited with the potential for injury or loss of life to those in proximity. In extreme cases effects there is potential for some effects to be observed beyond the fuel farm to the roadway and a small number of the closest residential dwellings.
- 17.10.15 Occupied buildings will form part of the development, and will include a terminal, aircraft control facilities, offices, warehouses workshops and tenanted buildings (including offices, industrial buildings and museums). There is the potential for visitor or user casualties of these buildings in the event of structural failure, collapse, and fire or as a result of health related hazards (e.g. hygiene, sanitation or disease control).
- 17.10.16 Airport roadways and external facilities and services may have the potential to cause injury to airport users and workers, from impact, collision or structural failure.
- 17.10.17 Transportation of equipment, people and fuel outside of the airport is addressed in **Chapter 14: Traffic and Transport**. There is potential for collision of vehicles, including tankers with other road users and pedestrians which may lead to injury or loss of life.
- 17.10.18 The Proposed Development and its working or visiting populations may be vulnerable to widespread external health issues (e.g. pandemic) or external factors outlined under the Kent Community Register¹³. Injury or loss of life may result from these situations, but the impact would generally be expected to be widespread and not specific or caused by the airport.
- 17.10.19 Historical site use also indicates that ordnance and civils (e.g. tunnels) may have been present at the site. There is therefore some possibility these could be revealed and lead to injury or fatality.
- 17.10.20 In the event of an air incident, populations in and around the airport, or close to the flight swathe may be affected, alongside aircraft occupants. Injury or loss of life may result from these events.
- 17.10.21 Extreme adverse weather (e.g. hurricanes) or external events (e.g. fires) have the potential to cause direct or indirect injury to people.

Mitigation

- 17.10.22 The protection of populations during airport operation are addressed principally in legislation under the obligations of the Health and Safety at Work Act, regulated under regulations including the Management of Health and Safety at Work Regulations and controlled under the EASA licensing EASA/CAA and associated relevant guidelines.
- 17.10.23 Key mitigations are outlined in **Appendix 17.2** and **Appendix 17.3** and include:
- ▶ Measures (as already outlined in paragraph 17.8.16 in **Section 17.8**. These will include specific assessments and implementation of appropriate practicable measures for the protection of the public (including for those located close to the runway and fuel farm), airport/aircraft users and airport workers;

- ▶ Protection against adverse weather and natural phenomenon effects will include;
 - ▶ Mitigations relating to drainage and containment as outlined in **Chapter 8: Freshwater Environment** and above under groundwater. Many are applicable to protect against extreme weather events;
 - ▶ Tank and equipment activities will allow for adverse weather events and natural phenomenon in their design basis; and
 - ▶ Procedures will be in place to restrict and make safe operations in adverse weather and relevant natural phenomenon as part of the operational safety management system. These events will also be allowed for in the Emergency Plan.
- ▶ There is specific consideration in the design and layout of key areas including the fuel farm to ensure that risks both onsite and offsite to people are reduced and controlled. Features involved in the existing design include separation of the fuel tanks in accordance with HSE requirements (HSG 176), specific containment considerations for primary, secondary and tertiary containment and associated drainage. Elimination of hazards where possible, and principles of risk reduction to 'ALARP' and inherent safety in the design process;
- ▶ Design processes for major accidents and disasters, including risk assessment, adoption of industry risk management practices (including 'ALARP' principles and inherent safe design approaches);
- ▶ Improvements and measures to the highway network in line with the findings of the Transport Assessment as indicated in **Chapter 14: Traffic and Transport**;
- ▶ Design measures for minimisation, appropriate storage, containment, drainage and siting of all material hazardous to humans, ignition control of flammable materials and suitable segregation and separation from occupied buildings;
- ▶ Design measures for minimisation, appropriate storage, containment, drainage and siting of all material hazardous to humans, ignition control of flammable materials, with suitable segregation and separation from occupied buildings and site boundaries;
- ▶ Design of buildings in line with UK building and fire safety regulations and current good practice;
- ▶ Site traffic and roadway strategy will be developed;
- ▶ A Security Plan will be developed to include aerodrome controls and access in line with EASA licensing requirements;
- ▶ No plans for import/export of hazardous freight and application of UK importation controls;
- ▶ Tenant controls including restrictions for usage as part of leasing agreement;
- ▶ The Proposed Development site is not located in a region of extreme adverse weather or in proximity to high hazard sites;
- ▶ Preconstruction inspection and surveys and ongoing monitoring for historic site issues, including UXO, residual chemicals and civils; and
- ▶ Risk assessments measures/procedures including site rules, barriers/guards, working from height and confined working procedures, personal protective equipment in line with risk assessment, site procedures and COSHH requirements.

17.10.24

It is concluded that a combination of these measures once implemented, good practice, conformance with the relevant EASA licensing, the Health and Safety at Work Act, EASA/CAA guidance and industry standard codes and practices will result in no significant effects to population receptors during operation.

17.11 Assessment of effects on land receptors

- 17.11.1 There are no designated land sites within close proximity of the Proposed Development, though some exist within the flight swathe. There is a remote possibility that these receptors in the flight design swathe could be exposed to direct or indirect effects from air incidents involving aircraft in flight, should one occur.
- 17.11.2 The effects on non-designated land sites are not considered to reach the thresholds of damage to constitute a major accident.
- 17.11.3 It is concluded that a combination of good practice, airport safety and environmental management and conformance with the relevant EASA licensing, EASA/CAA guidance and practices will result in no significant effects to the land receptors.

17.12 Assessment of effects on historic environment

- 17.12.1 There are no SMs or Grade 1 listed buildings within close proximity of the Proposed Development which could be affected by release of chemicals though a small number exist within the 1km study bound and within the flight swathe. None of the monuments are WHS.
- 17.12.2 Two SMs exist within the 1km RLB. There is a small potential for these to be affected in the unlikely event of an air incident.
- 17.12.3 There is a remote possibility that these receptors in the flight design swathe could be exposed to direct or indirect effects from air incidents involving aircraft in flight, should one occur.
- 17.12.4 There are no plans for the importation of internationally/nationally significant artefacts.
- 17.12.5 It is concluded that a combination of good practice, airport safety and environmental management and conformance with the relevant EASA licensing, EASA/CAA guidance and practices will result in no significant effects to the receptors of historic national or international significance.

17.13 Decommissioning phase effects

- 17.13.1 Decommissioning effects have been scoped out of the assessments as the Airport is envisaged to operate in perpetuity.

17.14 Conclusions of significance evaluation

- 17.14.1 The conclusions on the significance of major accident and disaster effects, in consideration of implementation of all of the incorporated measures outlined in **Table 17-6** and **Table 17-7**, is summarised below in **Table 17-12**.

Table 17-12 Summary of significance of adverse effects

Receptor	Significance Level with implementation of incorporated measures from Table 17-6 and Table 17-7	Rationale	Further work to be undertaken to support the ES
Groundwater/SPZ	Not Significant	The SPZ has been recognised as a specific area of sensitivity and design measures implemented to ensure risk is managed and controlled. This includes	No further work planned.

Receptor	Significance Level with implementation of incorporated measures from Table 17-6 and Table 17-7	Rationale	Further work to be undertaken to support the ES
		<p>consideration of separation in the layout, and primary, secondary and tertiary containment.</p> <p>Mitigation measures designed to protect the most sensitive receptors included in the design, construction and operation.</p> <p>Elimination or risk reduction to ALARP will be inherent in the design. Adoption of inherent safe design.</p> <p>An Environmental/Safety Management system, will be developed and include major accidents and disasters. An Emergency Plan will be developed.</p>	
Pegwell Bay and associated designated sites	Not Significant	<p>Sandwich and Pegwell Bay and its designated receptors and ecology have been specifically recognised as an area of sensitivity. The design has specifically allowed for this receptor.</p> <p>Mitigation measures are included in the design to protect the most sensitive receptors during both construction and operation.</p> <p>Elimination or risk reduction to ALARP will be inherent in the design.</p> <p>An Environmental/Safety Management system, will be developed and include major accidents and disasters. An Emergency Plan will be developed.</p> <p>EASA licensing and associated controls minimising potential for air incident.</p>	No further work planned.
Mitigation of flood risk and adverse weather	Not Significant	<p>Site drainage from hardstanding will be captured on site by the site drainage system.</p> <p>The design basis will include allowance for extreme weather events, and climate change over the design lifetime.</p> <p>Elimination or risk reduction to ALARP will be inherent in the design.</p> <p>An Environmental/Safety Management system, will be developed and include major accidents and disasters. An Emergency Plan will be developed.</p>	No further work planned.

Receptor	Significance Level with implementation of incorporated measures from Table 17-6 and Table 17-7	Rationale	Further work to be undertaken to support the ES
Designated heritage assets including Historic Buildings, SMs and Conservation Areas.	Not Significant	<p>Elimination or risk reduction to ALARP will be inherent in the design.</p> <p>None in close proximity to airport. EASA licensing and associated controls minimising potential for air incident.</p>	No further work planned.
Populations or occupied buildings offsite and onsite	Not Significant	<p>On very rare occasions, major accidents and disasters may be associated with aircraft operations, storage of flammable and chemical substances impacts/collisions, health or occupational incidents.</p> <p>However, the quantity of material that is intended to be stored/used falls below thresholds of concern required for hazardous consent, or control under UK major accident regulations, and the entire airport operations will follow the strict requirements of EASA licensing and relevant guidelines of EASA/ CAA.</p> <p>The design of the fuel farm and other areas of potential harm will specifically allow for resilience against natural phenomenon and major accidents as part of the design basis and operational management systems. There will be specific consideration in the design and layout of key areas including the fuel farm, to ensure that risks both onsite and offsite to people are controlled. Features included in the existing design include separation of the fuel tanks in accordance with HSE requirements (HSG 176), specific containment considerations for primary, secondary and tertiary containment and associated drainage. Elimination of hazard where possible, and risk reduction to ALARP as a minimum will be inherent in the design.</p> <p>Buildings will be designed to and conform to UK building and fire safety regulations, and current good practice.</p> <p>Improvement measures are planned for local highways.</p>	No further work planned.
Designated land (other than where covered under designations associated with Pegwell)	Not Significant	<p>Elimination of hazard where possible, and risk reduction to ALARP as a minimum will be inherent in the design.</p>	No further work planned.
Widespread habitat, non-designated land/water, soil	Not Significant	<p>Elimination of hazard where possible, and risk reduction to ALARP as a minimum will be inherent in the design.</p>	No further work planned.

Receptor	Significance Level with implementation of incorporated measures from Table 17-6 and Table 17-7	Rationale	Further work to be undertaken to support the ES
Particular species onsite	Not Significant	<p>Based on current understanding from the biodiversity assessment it is not expected that any significant effects would arise on site due to construction or operation.</p> <p>Mitigation (covered as part of the biodiversity assessment in Chapter 7: Biodiversity) and the current understanding that no species of national significance exist on site.</p> <p>No livestock or rare species importation plans</p>	No further work planned.
Particular species offsite	Not Significant	<p>The Pegwell Bay and its designated receptors and ecology have been specifically recognised as an area of sensitivity. The design has specifically allowed for this receptor.</p> <p>Mitigation measures are included in the design to protect the most sensitive receptors during both construction and operation.</p> <p>Elimination or risk reduction to ALARP will be inherent in the design.</p>	No further work planned.

Inter-related effects

- 17.14.2 For both construction and operation phases, this Chapter inherently takes account of relevant sources and receptors discussed in other topic Chapters to inform the analysis. There are therefore no other inter-related effects arising from interactions with other topic Chapters, beyond those already considered in the major accident and disaster assessment.

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18. Cumulative Effects

18.1 Introduction

- 18.1.1 The requirement for Cumulative Effects Assessment (CEA) is set out in Article 4(3) and Article 5(1) of the European Community (EC) *Directive 2014/52/EU*¹ (EU Directive, which is usually referred to as the EIA Directive). With respect to Nationally Significant Infrastructure Projects (NSIPs) under the Planning Act 2008 (as amended)², the requirements of the Directive are implemented through the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017³ (EIA Regulations). A range of public sector and industry-led guidance is available on CEA but at present there is no single, agreed industry standard method. Consequently, the approach to CEA varies between applications.
- 18.1.2 The EIA Regulations implement the EIA Directive “on the assessment of the effects of certain public and private projects on the environment” for the Planning Act 2008 regime. Schedule 3 paragraph 1 of the EIA Regulations, which refers to the selection criteria for screening Schedule 2 development, states that “*the characteristics of the development must be considered with particular regard to...(b) cumulation with other existing development and/or approved development*”.
- 18.1.3 The approach that has been taken in this environmental statement (ES) is to distinguish between combined (or inter-related) effects, and cumulative effects (see **Box 5.3** in **Chapter 5: Approach to the Environmental Statement**). This approach is consistent with the advice contained within PINS Advice Note 9⁴ and is in accordance with the 2017 EIA regulations.

Inter-related effects of the proposed development

- 18.1.4 The assessments have considered two types of inter-related effects. These are:
- ▶ consideration as to whether any of the individual effects of the Proposed Development (which is defined as all elements of the Proposed Development, as described in Section 3.3 of **Chapter 3: Project Description**), would combine to create a cumulative effect; and
 - ▶ consideration of interactive effects in relation to a specific receptor.
- 18.1.5 Typically, combined effects occur when different activities associated with a project act upon the same environmental receptor (e.g. the additive effect of noise from different sources upon local residents for example noise from piling activities may occur at the same time as transport related noise and may act upon the same receptor(s) during the construction phase). In determining such effects, consideration is given to the sensitivity of the receptor and the magnitude of environmental change.
- 18.1.6 Interactive effects are assessed in relation to a specific receptor, but here the effect could be caused by the interactions of different types of effect from project activities even if individually these are insignificant (e.g. the interaction of noise disturbance and light pollution on bat foraging). Where appropriate, professional judgment is used to assess interactive cumulative effects across topic areas.
- 18.1.7 National policy guidance requires that all relevant effects should be considered objectively. However, existing policy guidance presently does not provide advice on how such an objective assessment should be carried out. In the absence of any guidance, the cumulative assessment of inter-related effects from the proposed development seeks to draw upon the conclusions of the individual assessments of this ES and against each of the identified receptors evaluate the extent to which the sum of any predicted effects are likely to give rise to significant environmental effects.
- 18.1.8 These inter-related effects have been assessed, where appropriate, within the technical chapters (**Chapters 6-17**) of this ES, either within the concluding section on significance evaluation or as a summary immediately following each receptor assessment section.

- 18.1.9 An exception is the inter-relationship of effects on human receptors where, for example, a receptor may experience visual, noise and traffic effects, and each of these are considered in separate ES chapters. Inter-related effects on these receptors are therefore considered in this Chapter.

Cumulative effects with other developments

- 18.1.10 Cumulative effects are defined as the interaction of the Proposed Development and other ‘major’ developments (as defined by PINS Advice Note 9: Rochdale Envelope⁵) within the context of the site and any other reasonably foreseeable proposals in the vicinity, where there is the potential for combined environmental effects. The baseline assessments in the EIA include existing development. However in EIA terms, it is a requirement under the EIA Regulations to consider the future baseline situation which includes other schemes that are likely to be constructed or have not yet commenced but have a valid planning permission. In addition, proposed schemes which are the subject of a planning application (at the time of preparing the EIA) should also be considered.
- 18.1.11 This Chapter assesses the potential for cumulative effects associated with other developments, i.e. whether any other developments would contribute to creating, with the proposed development, a cumulative effect that would be greater than would occur if the Proposed Development project was being developed in isolation.

18.2 Assessment Methodology: Inter-related Effects

- 18.2.1 The inter-related effects assessment presented in this Chapter concerns interactive effects on human receptors only. As mentioned above, other inter-related effects have been assessed, where appropriate, within the individual chapters of the ES.
- 18.2.2 The first step in the inter-related effects assessment is to identify potential receptors that could be affected by more than one environmental topic. Each ES topic chapter was reviewed to identify the human receptors. Human receptors include residential and recreational receptors, as well as those at employment facilities. Human receptors considered in more than one ES topic chapter are part of the inter-related effects assessment.
- 18.2.3 Thresholds limits, beyond which cumulative change becomes a concern, for receptors were identified in the individual ES chapters against topic-specific criteria that are well established within standard EIA. Threshold limits for effects such as noise and air pollution for example are, for the purposes of establishing effects on human receptors, set at levels that if exceeded, can have nuisance or health implications for the receptor, thereby likely to result in significant effects. For the assessment of inter-related cumulative effects, receptors where such thresholds are exceeded, or where effects are close to such thresholds, were considered.
- 18.2.4 Professional judgment was used to assess which of the common receptors as likely to experience significant effects in the individual assessments, or close to the threshold of significance, in more than one individual topic area would be likely to experience significant cumulative effects. This was determined by the following criteria:
- ▶ the magnitude of effects identified in the individual assessments;
 - ▶ the probability of the identified effects occurring;
 - ▶ the likely duration of the identified effects;
 - ▶ the frequency of the identified effects; and
 - ▶ the ‘value’ or sensitivity of the receptor affected.

Human health

- 18.2.5 Human health effects are excluded from the inter-related effects assessment. The potential for human health effects as a result of changes related to multiple topics such as noise, air quality and

socio-economics are detailed in **Chapter 15: Health and Wellbeing**. However the inter-related effect of more than one of these changes acting in combination cannot be determined because

18.2.6 the health evidence does not allow summing of health effects via different pathways. This is because the supporting evidence base can, in certain circumstance overlap, and there is the potential for double-counting. Equally, this tends to mask the causal mechanism behind the potential health outcome, which in turn can limit the ability to establish effective mitigation to minimise the route cause, or enhance the uptake of potential benefits. On this basis, each of the potential health pathways related to each environment topic is considered individually in **Chapter 15: Health and Wellbeing**

18.3 Assessment of Inter-related Effects

- 18.3.1 Potential receptors for the inter-related effects assessment include human receptors and occupied properties, or locations where human receptors could potentially experience effects from the Proposed Development, such as outdoor amenity space, community facilities, roads and buildings. The air quality, freshwater environment, land quality, landscape and visual, noise, socio-economic, traffic and transport, health and wellbeing, climate change and major accidents and disasters chapters of the ES consider such receptors. Common receptors are assessed in at least two of these chapters, and therefore have potential to experience inter-related effects. For example human receptors in the village of Manston could experience both air quality, traffic and visual effects.
- 18.3.2 The individual assessments within each chapter of the ES have been reviewed and there are no effects on human receptors considered to be significantly adverse, or near to the threshold of adverse significance, within the air quality, freshwater environment, land quality, socio-economic, traffic and transport, climate change and major accidents and disasters Chapters. As such, interactive effects between these topics are unlikely to result in significant inter-related effects on human receptors.
- 18.3.3 Effects considered likely to be significant, or near to the threshold of significance, in relation to human receptors within the assessments in the ES chapters are as follows:
- ▶ Visual effects (**Chapter 11: Landscape and Visual Impact Assessment**): The Proposed Development has the potential to result in significant visual effects during construction and operation in relation to visual receptors located at 17 individual residential properties or groups of properties; two individual recreational facilities; five Public Right of Ways (PRoWs) or PRoW groups; and four photographic viewpoint locations (note that significant effects are expected to be likely only during construction or operation at several of the residential receptors). All other effects are considered to be not significant, and not boarding the threshold of significance.
 - ▶ Noise (**Chapter 12: Noise**): By Year 2020, the Proposed Development has the potential to result in significant noise effects during operation at:
 - ▶ up to 115 properties in the daytime (and an additional eight properties experiencing levels above Unacceptable Adverse Effect Level (UAEL));
 - ▶ 225 properties at night-time;
 - ▶ 11 community buildings in the daytime;
 - ▶ occupants of buildings or open space within the communities of Ramsgate, Pegwell Bay and Manston in the daytime; and
 - ▶ occupants of some buildings or open space within the communities of Ramsgate, Manston, Wade and West Stourmouth at night-time.

Additionally there is potential for likely effects that are close to the threshold for significance at 15 dwellings on Bell Davies Drive and Spitfire Way during construction at night-time.

- 18.3.4 Significant adverse health effects, which are limited to changes in noise exposure and air quality (**Chapter 15: Health and Wellbeing**) are excluded from this inter-related effects assessment for the reasons set out in **Section 18.2**.
- 18.3.5 **Table 18.1** describes the common receptors included in the visual and noise assessments where a likely significant effect or near significant effect has been identified. It also includes an assessment of potential inter-related effects on receptors from both visual changes and noise disturbance combined.

Table 18.1 Significant or near significant effects, common receptors and inter-related effects

Location	Significant noise effects and receptors	Significant visual effects and receptors	Inter-related effects
Residential properties on and near Spitfire Way	<p>Night time construction noise effects are close to the threshold of significance, but not considered significant with mitigation, during phase 3 and phase 4 of the Proposed Developmentⁱ</p> <p>Receptors - 14 dwellings on Bell Davies Drive and Spitfire Way in Minster</p>	<p>Significant (Year 1, Year 10 & Year 20) visual effect for residential receptor group 35: Pounces Cottages (no significant visual effects are anticipated at Rose Farm)</p> <p>Significant (Year 1) visual effect for residential receptor group 36: Properties on Bell Davies Drive</p>	<p>Noise and visual effects at Pounce Cottages will overlap during Years 23 – 36 through construction phases 3 and 4. The noise assessment concludes that one or a combination of the mitigation measures presented in Chapter 12: Noise would avoid significant effects and the assessment is based on reasonable programme assumptions available at this stage. The contractor will be required to apply to Thanet District Council for consent under Section 61 of the <i>Control of Pollution Act 1974</i>⁶ and this will include a reassessment of construction noise levels and construction noise mitigation based on more detailed information. At this stage, it is considered that significant effects could be reasonably avoided through the mitigation measures presented in Chapter 12: Noise.</p> <p>Therefore, although there is the potential for temporary inter-related effects through noise and visual disturbance, it is considered that these are unlikely to together, cause a significant effect.</p> <p>Noise and visual effects at Bell Davies Drive will not overlap as significant visual effects are predicted in Year 1, and the potential significant noise effects are predicted to be occurring during Years 23 – 30 through construction phase 3. There will therefore be no significant inter-related effects.</p>
Residential properties in close proximity to the airport runway	<p>Permanent significant day-time effects on individual residential receptors as a result of aircraft noise.</p> <p>Receptors –</p> <p>Up to 115 properties (located within day-time 63 dB Significant Observed Adverse Effect Level (SOAEL))</p> <p>Up to eight properties (located within day-time 69 dB SOAEL) - these properties are located at the north-eastern end of Cliffs End, towards the south-east corner of the site</p>	<p>Significant (Year 1, Year 10 & Year 20) visual effect for residential receptor groups:</p> <ul style="list-style-type: none"> 21: Alland Grange Lane properties 33: Manston – Properties in southern section of High Street 	<p>Regarding residents at Alland Grange Lane; the southern end of High Street, Manston; Pounces Cottages; the northern part of Cliffs End and on Canterbury Road West, south of Jentex site, without mitigation, these dwellings will be exposed to significant annoyance and disturbance as a result of the Proposed Development during operation. However the noise insulation scheme, if taken up, will reduce noise inside all dwellings such that it does not reach a level where it will significantly affect residents. However adverse</p>

ⁱ The phases of the Proposed Development are described in Chapter 3: Project Description. During phase 3 and phase 4, the main infrastructure to be constructed will be cargo aircraft stands, taxiways, aprons and associated cargo facilities, access, storage and parking areas. During phase 3, the existing cargo buildings adjacent to Spitfire Way would be demolished and an additional aircraft maintenance hangar would also be provided alongside the Maintenance Repair and Overhaul (MRO) facility. During phase 4, an additional aircraft passenger stand would be constructed next to the existing passenger apron. A further maintenance hangar could also be provided adjacent to the previously constructed MRO facilities.

Location	Significant noise effects and receptors	Significant visual effects and receptors	Inter-related effects
	close to the fuel farm on King Arthur Road.	<ul style="list-style-type: none"> 35: Pounces Cottages (no significant visual effects are anticipated at Rose Farm) 43: Properties in northern Cliffs End, north of Canterbury Road West 48: Properties on Canterbury Road West, south of Jentex site 	<p>impacts may remain in external areas such as gardens.</p> <p>Residents may also be exposed to significant visual effects, which have the potential to inter-relate with the operational noise effects. At Alland Grange Lane significant visual effects are likely to be experienced by residents in four two-storey properties in the northern part of this group only. At the southern end of High Street, Manston, in most instances, significant changes to views will be restricted to those available from upper-storey windows. Effects at Pounce Cottages will generally be restricted to views available from upper-storey windows. At Canterbury Road West, south of Jentex site the runway is not visible from ground level due to the intervening topography which results in a 'table top' effect, therefore upper storey windows are likely to have more expansive northerly views across the site.</p> <p>If the noise insulation scheme is taken up, effects are likely to affect residents only within gardens. However as views of the Proposed Development are generally restricted to upper-storey windows, and not gardens, significant adverse inter-related noise and visual effects are not anticipated.</p> <p>Bungalows at the northern part of Cliffs End would have close range views to the movements of aircraft on the runway and would be exposed to aircraft noise resulting in potential significant inter-related effects. As above, if the noise insulation scheme is taken up, significant effects are likely to affect residents only within gardens.</p> <p>Of these properties at the northern end of Cliffs End, up to eight properties will be exposed to noise during the operational phase resulting in unacceptable annoyance and disturbance as a result of the Proposed Development. Additionally, these properties have the potential to be significantly affected by visual effects which could exacerbate the impact on quality of life. However, these dwellings will be eligible for financial assistance for moving away from the Proposed Development as part of the dwelling relocation scheme (see Section 12.5 of Chapter 12: Noise for detailsⁱⁱ). This mitigation scheme will prevent unacceptable adverse effects of noise and significant visual effects if the occupier accepts the offer of assistance and relocates</p>
Residential properties in close proximity to the airport runway	<p>Permanent significant night-time effects on individual residential receptors as a result of aircraft noise.</p> <p>Receptors - Up to 225 properties (located within night-time 55 dB SOAEL)</p>	<p>Significant (Year 1, Year 10 & Year 20) visual effect for residential receptor groups:</p> <ul style="list-style-type: none"> 21: Alland Grange Lane properties 	<p>The noise effects concern impacts during the night-time. Although significant visual effects have been identified at common receptors, the assessment primarily relates to day-time visual effects.</p> <p>As stated in Chapter 11: Landscape and Visual Impact Assessment, based on outline</p>

ⁱⁱ A relocation assistance scheme will be offered by the airport authority to enable those homeowners exposed to the highest levels of airport related noise to move away from the Proposed Development. The dwelling relocation assistance will be offered if residents are exposed to unacceptable adverse effects on their health and quality of life.

Location	Significant noise effects and receptors	Significant visual effects and receptors	Inter-related effects
		<ul style="list-style-type: none"> 33: Manston – Properties in southern section of High Street 35: Pounces Cottages (no significant visual effects are anticipated at Rose Farm) 43: Properties in northern Cliffs End, north of Canterbury Road West 48: Properties on Canterbury Road West, south of Jentex site 	lighting principles for the Proposed Development that limit boundary lighting conditions to 1 Lux, it is not expected that there would be any significant effects as a result of the Proposed Development. The lighting of the Proposed Development (both airport and Northern Grass Area) will be the subject of further development and assessment and as this takes place the design will be reviewed and more detailed modelling of the likely impacts undertaken. At this stage, it is reasonable to assume that effects will not be significant or close to the threshold of significance, and therefore inter-related visual and noise effects on the common receptors are unlikely.
Non-residential buildings in proximity to the airport flight paths	<p>Permanent significant effects on non-residential receptors (located within day-time 50 dB lowest observed adverse effect level (LOAEL)) as a result of aircraft noise</p> <p>Receptors -</p> <ul style="list-style-type: none"> Manston School House Nursery; Chatham & Clarendon Grammar School; The Elms Nursery School; Priory County Infant School; Masque Theatre School; Fledglings Nursery School; Ellington Infant School; Minster Surgery; Christ Church; Spitfire and Hurricane Memorial Building and RAF Manston Museum; and Pie Factory Music. 	<p>Churches, schools and other community buildings are excluded from the visual assessment on the basis that they are located within the surrounding settlements and as a result fall outside of the Zone of Theoretical Visibility for the Proposed Development.</p> <p>One exception is the Spitfire and Hurricane Memorial Museum and RAF Manston Museum which lie within the Proposed Development site and the effects on the views of people visiting the museums have been assessed as part of Viewpoint 1 where significant (Year 1, Year 10 & Year 20) visual effects were determined.</p>	<p>No inter-related effects are anticipated on the churches, schools and other community buildings as there will be negligible visual effects.</p> <p>Inter-related and significant noise and visual effects during the operational phase on the Spitfire and Hurricane Memorial Museum, and on the adjacent RAF Manston Museum, will be experienced during arrival at and departure from the museums, and may also be experienced in relation to any outdoor exhibits that may be on display. The noise effects could disrupt, disturb or interfere the users of the museums.</p> <p>Visitors' experience of viewing the main collection (located indoors) will be unaffected by inter-related noise and visual effects as visual effects are constrained to outside areas only.</p>
Hamlet, village or town communities in proximity to the airport flight paths	<p>Permanent significant community effects (located within day-time 50 dB LOAEL) as a result of aircraft noise.</p> <p>Receptors - In the following communities, aircraft noise would increase to the point where there would be a perceived change in quality of life for occupants of buildings in these communities or a perceived change in the acoustic character of shared open spaces within these communities:</p> <ul style="list-style-type: none"> Ramsgate; Pegwell Bay; and Manston. 	<p>No significant visual effects at receptors in Ramsgate and Pegwell Bay.</p> <p>Significant (Year 1, Year 10 & Year 20) visual effects at Manston:</p> <ul style="list-style-type: none"> Residential receptor group 31: Manston – Properties on Preston Road Residential receptor group 32: Manston – Properties in northern section of High Street 	<p>The community of Manston will be impacted by permanent increased aircraft noise in the daytime, and properties in Manston and shared open spaces (namely PROWs) will be affected by long term visual changes. Additionally two caravan sites, which could be included in the "community" category used for the noise assessment, will also be affected by visual and noise effects.</p> <p>There is therefore the potential for the significant noise and visual effects to combine to create an even greater adverse effect on quality of life in this area through the perception of change in the acoustic character of the area and reduced ability to appreciate outdoor spaces. Cumulative noise and visual effects on indoor spaces are less likely to be significant for those residents eligible for the</p>

Location	Significant noise effects and receptors	Significant visual effects and receptors	Inter-related effects
		<ul style="list-style-type: none"> Residential receptor group 33: Manston – Properties in southern section of High Street Residential receptor group 42: Jubilee Cottages on Manston Road PRoW Receptors TR8, TR9, TR10 and TR22 Recreational receptor group 6 Manston Court Caravan Site Recreational receptor group 7 Preston Parks 	noise insulation scheme, if taken up (note that this will not apply to caravan sites).
Hamlet, village or town communities in proximity to the airport flight paths	<p>Permanent significant community effects (located within night-time 40 dB LOAEL) as a result of aircraft noise.</p> <p>Receptors - In the following communities, aircraft noise would increase to the point where there would be a perceived change in quality of life for occupants of buildings in these communities or a perceived change in the acoustic character of shared open spaces within these communities:</p> <ul style="list-style-type: none"> Ramsgate; Manston; St. Nicholas at Wade; and West Stourmouth. 	<p>No significant visual effects at receptors in Ramsgate, St. Nicholas at Wade and West Stourmouth.</p> <p>Significant (Year 1, Year 10 & Year 20) visual effects at Manston:</p> <ul style="list-style-type: none"> Residential receptor group 31 Manston – Properties on Preston Road Residential receptor group 32 Manston – Properties in northern section of High Street Residential receptor group 33 Manston – Properties in southern section of High Street Residential receptor group 42 Jubilee Cottages on Manston Road PRoW Receptors TR8, TR9, TR10 and TR22 Recreational receptor group 6 	<p>The noise effects concern impacts during the night-time. Although significant visual effects have been identified at common receptors, the assessment primarily relates to day-time visual effects.</p> <p>As stated in Chapter 11: Landscape and Visual Impact Assessment, based on outline lighting principles for the Proposed Development, it is not expected that there would be any significant effects as a result of the Proposed Development. The lighting of the Proposed Development (both airport and Northern Grass Areaⁱⁱⁱ) will be the subject of further development and assessment and as this takes place the design will be reviewed and more detailed modelling of the likely impacts undertaken. However, at this stage, it is reasonable to assume that effects are not likely to be significant or close to the threshold of significance, and therefore inter-related effects on the common receptors with noise are unlikely.</p>

ⁱⁱⁱ The Northern Grass area is located within the northern part of the red line boundary and will accommodate infrastructure critical to the running of the airport including airport-related businesses which do not require an airside location. A full description of the Northern Grass Area is provided in **Chapter 3: Description of the Proposed Development**.

Location	Significant noise effects and receptors	Significant visual effects and receptors	Inter-related effects
		Manston Court Caravan Site • Recreational receptor group 7 Preston Parks	
Residential properties in proximity to the airport flight paths	No significant noise effects.	Significant visual effect on residential receptor groups 22, 23, 25, 36, 38, 39, 40, 41 and 47.	Although these receptors fall within the 50dB day-time and 40dB night-time LOAELs, they do not fall within the "community" group categories, which is the receptor group identified for the LOAEL noise contours within the noise assessment. No significant or near significant noise effects, and therefore no significant inter-related effects, are therefore anticipated at these individual residential receptor groups identified as experiencing significant visual effects. Note that community effects are considered above under the 'Hamlet, village or town communities in proximity to the airport flight paths' assessments in this table.
Recreational footpaths to the north of the airport	Not a common potential receptor in the noise assessment.	Significant visual effect for PRoW Receptor Group C (which is a collection of PRoWs to the south of Margate and northwest of Ramsgate, as described in Chapter 11: Landscape and Visual Impact Assessment)	Although PRoW Receptor Group C falls within the 40dB night-time LOAEL, the PRoW does not fall within the "community" group category, which is the receptor group identified for the LOAEL noise contour within the noise assessment. In any case, night-time use of the PRoW is unlikely therefore inter-related noise and visual effects are not anticipated.
Viewpoints in close proximity to the airport	No common potential receptors in the noise assessment.	Significant visual effect for viewpoints VP2, VP3 and VP6	The viewpoints do not cover specific human receptors but are used to inform the visual impact assessment for the various residential, recreational and transport network receptors.

- 18.3.6 In summary, residential properties in close proximity to the airport runway (at Alland Grange Lane; the southern end of High Street, Manston; Pounces Cottages; the northern end of Cliffs End and on Canterbury Road West, south of Jentex site), have the potential to experience significant inter-related noise and visual effects during the daytime. However if the noise insulation scheme is taken up, inter-related effects are less likely. In this instance, potentially significant inter-related effects would likely be experienced by residents within gardens at the northern end of Cliffs End only. However, up to eight properties at the northern end of Cliffs End are also likely to experience significant indoor inter-related effects but will be eligible for financial assistance for moving away from the Proposed Development as part of the dwelling relocation scheme.
- 18.3.7 Significant inter-related effects during the daytime are also anticipated at the Spitfire and Hurricane Memorial Museum and RAF Manston History Museum in relation to visitor arrival and departure and any outdoor exhibits.
- 18.3.8 The community of Manston may also experience significant inter-related noise and visual effects during the daytime, in both shared open spaces and indoor spaces (particularly in the area of Preston Road, Manston; in northern section of High Street, Manston; in southern section of High Street; Manston; Jubilee Cottages on Manston Road; PRoWs TR8, TR9, TR10 and TR22; and Manston Court and Preston Parks caravan sites). Effects on some indoor spaces are less likely to be significant if eligible residents take up the noise insulation scheme, however this scheme will not apply to caravan sites.

18.4 Assessment Methodology: Cumulative Effects

- 18.4.1 The proposed approach to the assessment of cumulative effects with other developments is outlined in **Section 5.9 of Chapter 5: Approach to the Environmental Statement**.
- 18.4.2 The process for undertaking a CEA for an NSIP has been defined by PINS and is outlined within PINS Advice Note 17⁷. The guidance defines a four-stage process, as follows:
- ▶ Stage 1: establish the NSIP Zone of Influence (Zol) and identify long list of 'other development';
 - ▶ Stage 2: Identify short list of 'other development' for CEA;
 - ▶ Stage 3: Information gathering; and
 - ▶ Stage 4: Assessment.

Stage 1: NSIP Zol and Long List of 'Other Development'

- 18.4.3 In order to establish the long list of 'Other Development', the Zol for each of the EIA topics has been established through consultation with relevant statutory stakeholders and through reference to accepted industry guidance and standards relevant to the environmental topic. A summary of the Zols are shown in **Table 18.2**. In light of the environmental topic Zols, a 5km radius from the boundary of the Proposed Development was taken to be the overarching CEA Zol, which covers potential cumulative effects for all environmental topics. The 5km radius is shown on **Figure 18.1**.
- 18.4.4 It is considered that any cumulative effects from major developments beyond 5km of the Proposed Development application boundary would be limited to traffic and transport effects, and these are already accounted for in the air quality, noise and traffic and transport assessments presented in **Chapters 6, 12 and 14**. Such effects therefore are not discussed further in this Chapter.

Table 18.2 Environmental topics CEA Zone of Influence

Environmental Topics	Potential CEA Effects	Spatial Zol
Air Quality	Construction related air quality effects	All developments within 5km of the site boundary
	Operational related air quality effects	All developments within 5km of the site boundary
Ecology	Noise effects during construction and operation on ecological receptors	All developments within 5km of the site boundary
	Air quality effects during construction and operation on ecological receptors, including European sites and local sites	All developments within 5km of the site boundary
Freshwater Environment	Groundwater effects on the underlying Thanet Aquifer, Zol defined by the Southern Water Drinking Water Safeguarding Zone	Extent of Thanet Aquifer Source Protection Zone
	Surface water effects on the water quality in Sandwich and Pegwell Bays	Any development resulting in discharges to River Stour catchment up to Plucks Gutter
Historic Environment	Physical effects on buried archaeological remains	All developments within 5km of the site boundary
	Effects on the setting of designated heritage assets	Any development that is within the project Zone of Theoretical Visibility (ZTV)
Land Quality	Effects on controlled waters: principle aquifer in bedrock	Extent of Thanet Aquifer Source Protection Zone
	Effects on controlled waters: surface water drains	Any development resulting in discharges to River Stour catchment up to Plucks Gutter

Landscape and Visual Impact	Effects on landscape and visual receptors	Any development that is within the project Zone of Theoretical Visibility (ZTV)
Noise	Construction related noise effects	All developments within 5km of the site boundary
	Operational related noise effects	All developments within 5km of the site boundary
Socio-economic	Effects of businesses, local and sub-regional economy, and local receptors	All of Thanet District
	Employment creation	All of Thanet District
Traffic & Transport	Construction vehicle effects	All developments using the same local road network
	Increases in vehicles during operational phase	All developments using the same local road network

18.4.5 Planning Inspectorate Advice Note Seventeen⁸ advises that "other development" with potential to give rise to cumulative effects should be identified by the applicant with reference to the proposed NSIP's Zol. Paragraph 3.1.3 of Advice Note Seventeen states that having established and documented the Zol for each topic in the ES, the applicant should obtain available information on "other development". Table 3 in the advice note identifies the types of "other development" that should be included in a cumulative effects assessment as:

- ▶ Tier 1 development
 - ▶ under construction;
 - ▶ permitted application(s), but not yet implemented;
 - ▶ submitted application(s) not yet determined;
- ▶ Tier 2 development
 - ▶ projects on the Planning Inspectorate's Programme of Projects where a scoping report has been submitted;
- ▶ Tier 3 development
 - ▶ projects on the Planning Inspectorate's Programme of Projects where a scoping report has not been submitted;
 - ▶ identified in the relevant Development Plan (and emerging Development Plans - with appropriate weight being given as they move closer to adoption) recognising that much information on any relevant proposals will be limited; and
 - ▶ identified in other plans and programmes (as appropriate) which set the framework for future development consents or approvals, where such development is reasonably likely to come forward.

18.4.6 The criteria used in this assessment limited other development to major developments, using the definition for major development within the *Town and Country Planning (Development Management Procedure) (England) Order 2015*⁹, namely:

"major development" means development involving any one or more of the following –

(a) the winning and working of minerals or the use of land for mineral-working deposits;

(b) waste development;

(c) the provision of dwelling houses where— (i) the number of dwelling houses to be provided is 10 or more; or (ii) the development is to be carried out on a site having an area

of 0.5 hectares or more and it is not known whether the development falls within sub-paragraph (c)(i);

(d) the provision of a building or buildings where the floor space to be created by the development is 1,000 square metres or more; or

(e) development carried out on a site having an area of 1 hectare or more.

- 18.4.7 Any development which does not meet the criteria set out above for major development was excluded from the long list of other development. Where a development is at or close to the threshold for classification as a major development, professional judgement was used in order to determine whether or not the development should be excluded from the long list.
- 18.4.8 Searches of planning portals were undertaken of all applications submitted to Thanet District Council (TDC)¹⁰ and Dover District Council (DDC)¹¹. The searches made use of the following criteria:
- ▶ Only applications submitted or permitted since 1 March 2015, up to and including 13 March 2018; and
 - ▶ Applications to TDC and DDC within 5km of the airport boundary. This covers nearly the entirety of the Thanet District and the northern part of Dover District.
- 18.4.9 Consented DCO applications and those DCO applications that are not yet determined within the search area have also been included, and were searched for on the PINS website¹². Applications submitted since 1 April 2014, up to and including 13 March 2018 were considered, reflecting the longer timescales of NSIP developments. TDC and DDC Development Plans¹³ were also reviewed, alongside any other relevant spatial policy documents.
- 18.4.10 A list of the 'other developments' identified using the search criteria are included as **Appendix 18.1 and Appendix 18.2**.

Stage 2: Short List of 'Other Development'

- 18.4.11 In order to determine that the CEA is proportionate, Stage Two involved a high level information gathering exercise in order to determine:
- ▶ The scale and nature of 'other development';
 - ▶ The temporal scope of 'other development'; and
 - ▶ Any other relevant factors.
- 18.4.12 Information was therefore captured about the other developments including the proposed programme of consenting, construction, operation and decommissioning to determine whether there is overlap and any potential for interaction with the Proposed Development. Consideration was given to the scale and nature of the developments identified in the ZOI, to determine whether they were likely to interact with the proposed NSIP and to result in a cumulative effect.
- 18.4.13 Professional judgement was used in order to avoid excluding 'other development' that was close to the threshold limits but had characteristics likely to give rise to a significant effect; or could give rise to a cumulative effect by virtue of its proximity to the proposed NSIP. Similarly, professional judgement was applied where 'other development' was considered to not give rise to discernible effects. Generally, all major developments within a 1km radius of the Proposed Development boundary were selected for the short list. This 1km radius also covered the operational daytime significant observed adverse effect level (SOAEL) and night-time SOAEL (as detailed in **Chapter 12: Noise and Vibration**) for the runway. Additionally, all developments that have or will likely require an EIA within 5km of the Proposed Development boundary were shortlisted.
- 18.4.14 Developments were also scoped-out on the basis that the development:

- ▶ was understood to have already undergone construction or will be complete and operational before construction of the Proposed Development and therefore is part of the current baseline or will form part of the future baseline conditions and has been considered on that basis;
- ▶ was unlikely to have commenced prior to the completion of the Proposed Development and/or insufficient information is available to complete an assessment at this time. Therefore any cumulative effects assessment would need to be completed by the developer/applicant for that particular proposal; or
- ▶ was of sufficient distance from the Proposed Development that significant cumulative effects are not likely to occur.

Local Development Plans

18.4.15 TDC had prepared a draft Local Plan (2015, with revisions in 2017), however this was withdrawn on 18 January 2018 after members voted to discontinue with the emerging Local Plan. As such, the lack of a recently adopted or even a draft local plan results in some uncertainty regarding which elements of the existing plan and the now withdrawn draft plan should be viewed as reasonably foreseeable development. As such a bespoke methodology was developed that enabled a scoping exercise to establish which Local Plan allocations can be considered as reasonably foreseeable. The outputs of this exercise are summarised in [Table 18.3](#) below.

Table 18.3 Scoping exercise for allocations in Local Development Plans

Local Plan	Scoped in	Scoped out
TDC 2006	<ul style="list-style-type: none"> Allocated sites carried over into the emerging but now withdrawn 2015 and 2017 plans. 	<ul style="list-style-type: none"> Allocations already constructed. Allocations subject to a planning application (and thus captured as a Tier 1 development). Allocations not taken forward to the 2015 and 2017 plans as the likelihood for these sites actually being developed is unknown and are arguably, less likely to come forward than those identified in the 2015 and 2017 plans. If such allocations were to be included again in any emerging plans, they are unlikely to be constructed by 2021 (which is after the main period of construction of the Proposed Development). If such allocations are constructed after this date, any designs and assessments for the developments should take the Proposed Development into consideration.
TDC 2015	<ul style="list-style-type: none"> Residential allocations listed in the 2015 plan and taken forward to the 2017 plan. 	<ul style="list-style-type: none"> Allocations already constructed. Allocations subject to a planning application (and thus captured as a Tier 1 development). Residential allocations listed in the 2015 plan but not taken forward to the 2017 plan. These are assumed to be no longer appropriate for development. If such allocations were to be included again in any emerging plans, they are unlikely to be constructed by 2021 (which is after the main period of construction of the Proposed Development). If such allocations are constructed after this date, any designs and assessments for the developments should take the Proposed Development into consideration. Non-residential allocations. Dates for being brought forward were not provided in the plan and it is therefore unknown when construction would be likely to take place, if it all. Thus these non-residential allocations are not reasonably foreseeable for the purposes of the CEA.
TDC 2017	<ul style="list-style-type: none"> All residential allocations in the emerging but now withdrawn 2017 amendments plan, due to be brought forward in the time periods 2019-2020 and 2020-2021. It is considered likely that such sites will still come forward in 	<ul style="list-style-type: none"> Allocations already constructed. Allocations subject to a planning application (and thus captured as a Tier 1 development). Non-residential allocations. Dates for being brought forward were not provided in the plan and it is therefore

Local Plan	Scoped in	Scoped out
	<p>any new consultation draft of the Local Plan and timescales for development of these sites was provided in the 2017 plan. The main construction period of the Proposed Development will be in 2019 and 2020.</p> <ul style="list-style-type: none"> Only allocations considered to be 'major development' within 1km of the Proposed Development boundary with this distance extended to 5km for allocations likely to constitute EIA development. 	<p>unknown when construction would be likely to take place, if it all.</p> <ul style="list-style-type: none"> Residential allocations due to be bought forward beyond 2021 as the main construction period of the Proposed Development will be in 2019 and 2020 and such allocations are not reasonably foreseeable. If such allocations are constructed after this date, any designs and assessments for the developments should take the Proposed Development into consideration.
DDC 2002 and 2015	<ul style="list-style-type: none"> Only allocations considered to be 'major development' within 1km of the Proposed Development boundary, with this distance extended to 5km for allocations likely to constitute EIA development. 	<ul style="list-style-type: none"> Allocations already constructed. Allocations subject to a planning application (and thus captured as a Tier 1 development).

18.4.16 The short list is presented in **Table 18.4** below, and the reasons including the reasons for inclusion and exclusion of 'other developments', are included in **Appendix 18.1** and **Appendix 18.2**. The location of the short list of 'other developments' is included in **Figure 18.1** and **Figure 18.2**.

Stage 3: Information Gathering

18.4.17 Information collected on the shortlisted developments included, but was not limited to:

- ▶ Proposed design and location information; and
- ▶ Environmental assessments that set out baseline data and effects arising from the 'other development'.

18.4.18 Relevant data was sourced from publicly available information set out on project websites and/or the TDC, DDC and PINS planning websites.

Table 18.4 Short list of developments considered within the assessment of inter-project cumulative effects

ID	Development	Brief description	Status and programme
3	<p>Southall Close residential (12 dwelling)</p> <p>Land Adjacent 15 Southall Close Minster, Ramsgate, Kent</p> <p>OL/TH/16/0967</p> <p>Thanet District Council</p> <p>0.27km from boundary</p>	<p>Outline application for the erection of 12 detached dwellings with access via Southall Close including access, layout and scale. Land adjacent 15 Southall Close Minster Ramsgate Kent.</p> <p>This application relates to a site that abuts a late 20th century development of houses to the east of Tothill Street, immediately south of the recently completed hotel development, petrol filling station, Lorry Park and drive through fast food retail outlet adjacent to the Prospect Roundabout. The site is effectively surrounded on three sides by built development. The proposal includes for 12 two storey three and four bedroom houses with large gardens and access.</p>	<p>Granted planning permission on 15/09/2017. Application is currently at the outline stage and progressing, with a variation of a condition to alter the layout being applied for in January 2018 (F/TH/18/0122). The construction programme is not available however it is assumed that construction will commence shortly.</p>
5	<p>Manston Green residential (19 dwellings), live-work and shop/café</p>	<p>Outline application for mixed use residential and business development comprising 19 dwellings, 4 live-work units, and a detached building incorporating a shop and café, together with associated access roads,</p>	<p>Awaiting decision. Currently at outline stage. It is not known when construction is anticipated to start, or the duration of the construction phase.</p>

ID	Development	Brief description	Status and programme
	<p>Lands between Manston road and Preston Road, Adjoining Manston Green Industries, Manston, Ramsgate, Kent</p> <p>OL/TH/16/0417</p> <p>Thanet District Council</p> <p>0.54km from boundary</p>	<p>paths and vehicle parking, including access and layout.</p> <p>The proposals include 21 car parking spaces, two motorcycle spaces and six cycle storage. A Grade II Listed Building is located on site. The highway works including the widening of Preston Road and works to Manston Road (relocation of traffic island, new footway, extension of red surfacing, and works to the kerb).</p>	
13	<p>Flambeau Europlast Ltd residential (120 dwellings)</p> <p>Flambeau Europlast Ltd Manston Road Ramsgate Kent CT12 6HW</p> <p>OL/TH/15/0187</p> <p>Thanet District Council</p> <p>0.95km from boundary</p>	<p>Outline application for the redevelopment of the existing site for up to 120 dwellings including access, following demolition of existing buildings.</p> <p>Dwellings will be mainly two storey but there will be some three storey houses (approximately five two storey houses to every one three storey house), and some flats. There is the potential for the number of dwellings to increase to 122.</p> <p>The site is brownfield and currently occupied by the Flambeau Europlast industrial building fronting the south side of Manston Road, Ramsgate (which will be demolished). Highway works include improvements to Manston Road (pedestrian refuge island being constructed and a new access into in the new housing development). There is a large area of open space to the north east of the site.</p>	<p>Granted planning permission on 07/11/2017. Application is currently at the outline stage. The construction programme is not available.</p>
14	<p>Westwood Phase 5 residential (469 dwellings), community, commercial and infrastructure</p> <p>Westwood. Land North Of Haine Road Broadstairs And West Of Nash Road MARGATE Kent</p> <p>R/TH/15/0250</p> <p>Thanet District Council</p> <p>1.86km from boundary</p>	<p>Application for approval of access, appearance, landscaping, layout and scale pursuant to condition 1 of planning permission reference F/TH/12/0964 for the development of Phase 5 of a mixed use urban extension comprising residential, community and commercial use, open space, infrastructure and new access. Total 469 houses and 1642m² of non-residential development.</p> <p>The proposal includes commercial use, a new community hall, potential medical centre, offices and retail outlets, new two form entry primary school, extended central park, equipped play zones, ecology zones, recreation trails, major programme of highways infrastructure and extension of commercial bus services. Residential dwellings will be a mix of two to four bed homes and one to two bed flats.</p> <p>Application relates to OL/TH/06/0650 (Westwood) which is for a multiphase mixed development. The outline permission includes:</p> <ul style="list-style-type: none"> Phase 1: Work now complete: 74 homes and road construction and improvements Phase 2: Work commenced July 2014 and nearing completion: 132 homes and road construction Phase 3: Pub and Farmfoods work complete, homes not started yet): 97 homes, Hungry Horse Pub, Farmfoods Retail Store, road construction. 	<p>Granted planning permission on 21/08/2017. Construction has not commenced, but it is understood that it will be completed by 2028.</p>

ID	Development	Brief description	Status and programme
		<ul style="list-style-type: none"> Phase 4: Housing works not commenced: 204 homes, road construction. <p>Planning applications related to these earlier phases were validated prior to April 2014 or earlier.</p>	
15	<p>Cliffsend Farm Cottages residential (31 dwellings) and retail</p> <p>Cliffsend Farm Cottages, Cliffs End Road, Ramsgate</p> <p>OL/TH/15/0537</p> <p>Thanet District Council</p> <p>0.06km from boundary</p>	<p>Outline application for the erection of 31 dwellings and retail unit, including access.</p> <p>The site lies in the centre of the village of Cliffsend, located to the south of the railway line, to the north of Cliffsend Road and east of Foads Lane. The proposals include a mix of 3-5 bedroom houses and retail unit comprising 1000 square foot of ground floor area. Traffic calming and improved pedestrian and cycle access through parts of the village are proposed.</p>	<p>Granted planning permission on 21/01/2016. At outline stage and progressing, with reserved matters being granted permission in August 2017 and conditions being discharged throughout 2016 and 2017. The construction programme is not known.</p>
24	<p>Chilton Lane residential (14 dwellings)</p> <p>Land Adjoining 1 Chilton Lane And Canterbury Road East, Ramsgate, Kent</p> <p>OL/TH/16/1416</p> <p>Thanet District Council</p> <p>0.44km from boundary</p>	<p>Outline application for erection of 14 No. detached dwellings including access, layout and scale.</p> <p>The site lies immediately south of the A255. It is currently greenfield and is effectively sandwiched between two roundabouts. Proposals include 14 two storey detached dwellings with associated garages and new access onto Canterbury Road.</p>	<p>Awaiting decision. The construction programme is not available.</p>
29	<p>Manston Road/The Beacon residential (48 dwellings)</p> <p>Land South Of Manston Road Adjacent To The Beacon (Former Car Storage Site) Manston Road, Ramsgate, Kent</p> <p>OL/TH/16/1715</p> <p>Thanet District Council</p> <p>0.73km from boundary</p>	<p>Outline application for 48 dwellings including access with all other matters reserved.</p> <p>The site is located to the south of Canterbury Road East adjacent to the roundabout that links to London Road and Nethercourt Hill to the east. The site is approximately 0.81 hectares in size. The proposals include a mixture of three and five storey houses.</p>	<p>Awaiting decision. The construction programme is not available.</p>
31	<p>Cottingham Road residential (41 dwellings)</p> <p>Land North Of Cottingham Road And East Of Lavender Lane</p> <p>OL/TH/17/0151</p> <p>Thanet District Council</p> <p>0.61km from boundary</p>	<p>Outline application for the erection of up to 41 no. dwellings including access with all other matters reserved.</p> <p>Currently open arable land used to grow wheat.</p> <p>The site lies approximately 350m to the west of Cliffsend village centre and is 1.47 ha in size. The area proposed for housing is currently agricultural land that adjoins existing residential areas and the planning application involves the development of 41 dwellings, with access via a new junction connecting to Cottingham Road.</p>	<p>Awaiting decision. The construction programme is not available.</p>
32	<p>Oakland Court residential (23 dwellings)</p> <p>Land Adjacent To Oakland Court Cottingham Road Cliffsend</p> <p>OL/TH/17/0150</p>	<p>Outline application for the erection of up to 23 no. dwellings including access with all other matters reserved.</p> <p>The site is 1.07ha and situated adjacent to the village of Cliffsend. The proposals include one and two storey houses and a new T junction of Cottingham Road.</p>	<p>Awaiting decision. The construction programme is not available.</p>

ID	Development	Brief description	Status and programme
	Thanet District Council 0.62km from boundary		
33	40 Canterbury Road West residential (62 dwellings) Land East Of 40 Canterbury Road West, Ramsgate, Kent OL/TH/17/0152 Thanet District Council 0.15km from boundary	Outline Application for the erection of up to 62 no. dwellings including access with all other matters reserved. The site is 2.4 ha and located adjacent to the north western edge of Cliffsend. The proposals include a mix of one and two storey houses, 3300m ² of public amenity space. A new T-Junction access will be created from Canterbury Road West A253.	Awaiting decision. The construction programme is not available.
81	Kings End Farm mast Kings End Farm, Richborough, Sandwich 16/00201 Dover District Council 4.75km from boundary	Scoping Opinion under the Environmental Impact Assessment Regulations 2011 (as amended) for the erection of a 305m high communications mast. The site comprises open arable farmland, approximately 1km north of Richborough, 1km south of the river Stour, and 1.5km west of the former Great Stour Richborough power station and industrial development. The communication mast will support a small range of antenna and dish equipment. The base of the mast will be enclosed within a 13m by 15.8m compound, bounded by a 2.4m high palisade fence, with a 1.2m high stock proof fence beyond this.	A scoping opinion was provided by DDC on 04/04/2016. Construction is expected to take 24 weeks but it is unknown when it is likely to commence.
127	Little Cliffsend Farm industrial (2 units) Little Cliffsend Farm Chalk Hill, Ramsgate, Kent F/TH/16/1417 Thanet District Council 0.25km from boundary	Erection of 2 new Industrial Units for B8 use for storage and distribution, together with creation of new access route and ground profiling to provide landscape shielding of access way and development. The development is located 135m from the nearest public road and the application site is located within an area used for parking/storage and is surrounded by a landscaping bund with tree planting. The proposed industrial units are large in height and scale (7m to eaves and 8.5m to the ridge). There is the potential for fuel, oil and chemical storage on site. Hard standing, driveways, roads and pathways will be finished with concrete.	Granted planning permission on 20/06/2017. Conditions were being discharged throughout the latter half of 2017 and there is therefore potential for construction to commence shortly.
133	Thanet Extension Offshore Wind Farm EN010084 Planning Inspectorate: NSIP 0.55km from boundary	An offshore wind generating station of capacity up to 340 MW, including onshore landfall, transition pit, cabling and substation developments. The site is located approximately 8 km offshore (at the closest point), in proximity to the operational Thanet Offshore Wind Farm. There are likely to be in the region of 34 offshore turbines, 125m in height with 180m rotor diameter. The project would also require onshore infrastructure in order to connect the proposed offshore wind farm to the electricity network, which in summary will comprise: <ul style="list-style-type: none"> Landfall and transition pit; 	The application is expected to be submitted to the Planning Inspectorate Q2 2018. A scoping opinion has been produced and a Preliminary Environmental Information Report is due to be submitted shortly. Offshore works are expected to commence Q1 2021 and onshore enabling works are expected to commence Q4 2020 with all onshore works complete by Q4 2021.

ID	Development	Brief description	Status and programme
		<ul style="list-style-type: none"> Underground export cables; and Onshore substation. <p>Landfall and transition pit: There are two landfall sites under consideration: Pegwell Bay and Sandwich Bay. Construction would be achieved by open trenching or Horizontal Direction Drilling beneath the intertidal area. There are likely to be four transition pits (below-ground structures that house the joints between offshore export cables and the onshore export cables) with each pit 10m (width) x 15m (length) x 5m (depth).</p> <p>Installation of the Onshore Cables: There are two cable route options connecting landfall to the proposed Richborough substation. All cables will be laid in trenches within individual ducts. The onshore cables would be installed via an open cut method in up to four trenches with each trench being approximately 1.5m deep and 1m wide. The total length of Option 1 Pegwell Bay Onshore Cable Route is approximately 2.5km. Option 2 Sandwich Bay Landfall will be 7km using both open cut and Horizontal Direction Drilling underneath waterbodies.</p> <p>Construction of the Substation: The substation will be constructed at the old Richborough Power Station site. As a worst case, the compound footprint will be 200m x 130m and the substation building footprint will be 30 x 30m. Building height will be 13m. Construction of access roads to the substation would be undertaken.</p>	
134	Richborough Connection Project EN020017 Planning Inspectorate: NSIP Substation is 2.89km from boundary and Over Head Line route is 1.89km from boundary at the nearest point.	<p>The Richborough Connection project is a new 400kV overhead line electricity connection between Richborough and Canterbury. It will connect the Nemo Link (an electricity link between Herdersbrug in Bruges and Richborough, near Sandwich in the UK) to the UK's high voltage electricity network.</p> <p>The proposed development includes the following principal elements:</p> <ul style="list-style-type: none"> Construction of a 20km 400kV overhead line and pylons; The removal of an existing 132kV overhead line between UK Power Networks Canterbury South and Richborough Substations; Localised temporary and permanent diversions of the existing 132kV overhead line (at crossings of the 400kV route); and Other works, for example, temporary access roads, highway works, construction compounds, protective scaffold structures, work sites and ancillary works 	<p>The Secretary of State has granted development consent for this application 03/08/2017. Construction is underway and is due to be completed by summer 2021.</p>
138	Thanet Parkway Railway Station N/A Kent County Council	<p>Proposed new parkway railway station in East Kent. The new Thanet Parkway will be located on the existing Ashford International to Ramsgate line, south of the former Manston Airport site and just to the west of the village of Cliffsend.</p>	<p>No planning application has been submitted to date although a second consultation exercise was run in Spring 2017. Work on the planning application is currently underway, which could be submitted in 2018, with construction</p>

ID	Development	Brief description	Status and programme
	0.8km from boundary	The proposed development will be constructed and operated on an approximate two ha site between Cliffsend and Pegwell. The station has been designed with two platforms and parking will be provided for 300 cars, motorcycles and 40 cycle parking spaces. Electric vehicle charging points will also be provided. A set down area will be provided for buses, taxis and passenger drop off. A new direct access road will be provided.	commencing 2020 and lasting for one year.
143	<p>Manston Green residential (785 dwellings), infrastructure, community and commercial</p> <p>Land East And West Of, Haine Road, Ramsgate (Manston Green)</p> <p>OL/TH/14/0050</p> <p>Thanet District Council</p> <p>Overlaps with a small portion of eastern extent of the red line boundary</p>	<p>Application for outline planning permission including access for the erection of 785 dwellings, highways infrastructure works (including single carriageway link road), primary school, small scale retail unit, community hall, public openspace.</p> <p>The site forms the part of the western edge of Ramsgate and extends to approximately 49.7 hectares, consisting of gentle sloping arable land. The majority of dwellings at Manston Green will be 2 and 2.5 storeys, with the opportunity to have 3 storeys.</p>	<p>Granted planning permission on 13/07/2016. The construction programme is not available. However in February 2018 the project received funding from the Government's Housing Infrastructure Fund therefore it is likely for this development to progress in the near future.</p> <p>The Manston Green site overlaps with a small section of the Proposed Development red line boundary. In this location, the Proposed Development site will be used for landing lights only, and the lights are unlikely to extend to the far eastern extent of the boundary. The area of overlap in the outline masterplan for Manston Green is shown as open space and a new link road. RiverOak and the Manston Green developers will be working together at detailed design stage to confirm use of this area of overlap.</p>
150	<p>Eurokent residential (550 dwellings), business units, commercial, community and infrastructure</p> <p>Eurokent, Westwood, Thanet</p> <p>OL/TH/11/0910</p> <p>Thanet District Council</p> <p>2.5km from boundary</p>	<p>Application for outline planning permission for mixed-use development for up to 550 dwellings; up to 63,000sqm Class B1 business floorspace; car showroom; a new local centre comprising up to 2,000sqm convenience retail (class A1, A2, A3), community facilities up to 5,000 sqm (class D1/D2) and community healthcare up to 1,200sqm (class D1); and associated highway works with all matters reserved.</p> <p>The site is 23.8ha of mainly agricultural land located at the existing Eurokent site, to the east and west of the New Haine Road section of the A256, in the Westwood area of Thanet. Proposals include a mix of two, three and four bedrooms dwellings and a small number of flats in addition to up to 63,000m² employment space, 2,000m² of local retail floorspace and 1,200m² for the Primary Health Care Trust.</p>	<p>Granted planning permission on 29/10/2014 after an appeal. The application is progressing, with conditions being discharged throughout 2017.</p> <p>The construction programme is not available however the ES stated that the construction activity would likely be phased over a 7 year period from 2012 to 2018. It is assumed that construction has not commenced but will do shortly.</p>
153	<p>Manston Court residential (22 dwellings)</p> <p>Manston Court Bungalows 5 Manston Road Manston RAMSGATE Kent</p> <p>OL/TH/17/1763</p> <p>Thanet District Council</p> <p>0.35km from boundary</p>	<p>Outline planning application for the erection of 22 dwellings including access.</p> <p>The site is 0.8ha of mainly tall grassland with patches of dense scrub, located within a semi-rural environment to the west of Manston village. The proposals include for semi-detached and detached, two-storey dwellings, served off the internal access road of the adjacent development site, at Manston Bungalows.</p>	Awaiting decision. The construction programme is not available.

ID	Development	Brief description	Status and programme
156	Manston Business Park industrial (19 units) Plot 8a Manston Business Park, Manston, Kent F/TH/17/1589 Thanet District Council 0.31km from boundary	Erection of 19 No. general industrial units, associated parking and access road. The site is located off Columbus Avenue and forms part of Manston Business Park Industrial Estate. The site is located towards the southern end of the estate and is currently an undeveloped vacant site. The proposal is for 19 units in five blocks, 11 of the units are approximately 190m ² and the remaining eight units are approximately 90.00m ² . The total development building footprint is 2810m ² and the total site area is 6677m ² / 1.65 acres.	Awaiting decision. The construction programme is not available.
166	Manston Business Park industrial (22 units) Plot 9a, Manston Business Park, Manston, Kent F/TH/17/1063 Thanet District Council 0.31km from boundary	Erection of 22 No. general industrial units, associated parking and access road. The site is located off Invicta Way and forms part of Manston Business Park Industrial Estate. The site is located towards the southern end of the estate and is currently an undeveloped vacant site. The proposed use of the site is to erect 22 units with associated parking and access road. 20 of the industrial units are 10mx8m and two of the units are 12mx11m. The total development building footprint is 1732m ² . The total site area is 1.54 acres.	Granted planning permission on 08/11/2017. The construction programme is not available however construction is unlikely to be imminent as conditions have yet to be discharged.
173	Manston Business Park business and industrial (46 units) Plot 7 + 8, Manston Business Park, Manston, Kent F/TH/16/1744 Thanet District Council 0.22km from boundary	Erection of a 3 storey block containing 4 No. Offices and 46 No. General Industrial Units with associated parking and access road. The site is located to the east of Columbus Avenue and forms part of Manston Business Park Industrial Estate. The proposal is for four office units in one block totalling 1172m ² and 46 industrial units in 10 blocks and a single unit, all the units being approximately 90m ² . The total development building footprint is 5312m ² and the total site area is 13,031m ² .	Granted planning permission on 16/06/2017. No construction timescale is provided in the planning documents, however conditions have been approved since June 2017, and a condition variation was approved on 19/10/2017 (F/TH/17/1039).
174	St Stephens residential (100 dwellings) St Stephens, Haine Road, Ramsgate, Kent OL/TH/16/1374 Thanet District Council 0.86km from boundary	Application for outline planning permission for 100no. dwellings with creation of access on to Haine Road, and all other matters reserved, on land at and adjoining St Stephens Bungalow. The 4 ha agricultural site is located west of Haine Road and south of Spratling Lane. The proposals include for a mixture of two to five two storey bedroom dwellings. St Stephens bungalow will be demolished. The hybrid application consists of outline approval for 95 dwellings and planning approval for five dwellings.	Awaiting decision. The construction programme is not available.
176	Mushroom Farm industrial (4 units) Mushroom Farm, Manston Road, Margate, Kent F/TH/17/1056 Thanet District Council 0.02km from boundary	Change of use of land and existing buildings along with the erection of 4No industrial buildings for mixed use as use classes B1, B2 and B8 with associated landscaping bund and car parking areas. The 3 ha site comprises a redundant fire damaged agricultural building and surrounding land located along Manston Road. The site lies adjacent to the existing commercial premises of the DDS demolition waste processing site to the north, with the	Granted planning permission on 08/01/2018. No construction timescale is provided in the planning documents.

ID	Development	Brief description	Status and programme
		Manston Airport site directly to the south. DDS will expand onto the site which will be used for storage of plant and materials for the recycling service.	
190	The Loop industrial (9 units) Land On West Side Of The Loop, Manston, Ramsgate Kent F/TH/18/0093 Thanet District Council 0.65km from boundary	Erection of 9No. industrial units, together with associated external works. The site is located to the east of Columbus Avenue and forms part of Manston Business Park Industrial Estate. The proposal is for nine units in three blocks.	Awaiting decision. The construction programme is not available.
191	Cummins Power Generation test cells Cummins Power Generation Ltd Columbus Avenue, Ramsgate, Kent F/TH/15/0592 Thanet District Council 0.65km from boundary	Erection of 1no. 2-storey building, installation of 2no. test cells and relocating of existing test cells. The site is located at Cummins Power Generation building and involves the construction of a building and erection of test cells on the western side. IT will be used for the delivery, dis-assembly, testing and re-assembly of generator sets within a new building extension.	Granted planning permission on 22/12/2015. No construction timescale is provided in the planning documents.
192	Invicta Way batching plant and commercial (10 units) Land West Of Invicta Way, Ramsgate, Kent F/TH/17/1756 Thanet District Council 0.36km from boundary	Erection of a concrete batching plant with workshop, office, storage units and concrete bays associated parking (Phase 1) together with erection of 10 commercial units with associated parking (Phase 2). The 0.1 ha site is located to the north and west of Invicta Way, and south of Cummins Power Generation building, in Manston Business Park. Phase 1 includes a concrete distribution yard with office and workshop for lorry repairs and concrete storage bays. Phase 2 includes 10 purpose built commercial units in two blocks.	Awaiting decision. The construction programme is not available.
193	Columbus Avenue industrial (3 units) and office Land East Of Columbus Avenue, Ramsgate, Kent F/TH/17/1169 Thanet District Council 0.49km from boundary	Erection of 3No. general industrial units, 1No two storey office unit, access road and associated parking. The site is located to the east of Columbus Avenue and forms part of Manston Business Park Industrial Estate. The proposal is for three separate industrial units and a two storey office. The site is 4303 m ² .	Awaiting decision. The construction programme is not available.
A	Westwood - Strategic Site Thanet District Council 1.8km from boundary	The site is allocated for 1450 dwellings. The site lies in close proximity to Nash Road and Manston Road and any development located on this site would be expected to improve these roads. The development would also have to include a minimum of 16.63 ha of open space and some small scale convenience retail.	No planning application has been submitted to date. Allocation is due to come forward 2019 - 2021.
B	Westgate-on-Sea - Strategic Site Thanet District Council	The site is allocated for 1000 dwellings. The site is located on land to the east and west of Minster Road.	No planning application has been submitted to date. Allocation is due to come forward 2019 - 2021.

ID	Development	Brief description	Status and programme
	2.35km from boundary	Any development located on this site would be required to provide a minimum of 11.1 ha of open space and some small scale convenience retail. The development would also have to provide 2.05 ha of land for a primary school.	
C	Land at Manston Court Road/Haine Road - Strategic Site Thanet District Council 1.05km from boundary	This mixed use site is allocated for 700 dwellings and leisure uses. The site is located on land near Manston Court Road and Haine Road. Any development located on this site would be required to provide infrastructure improvements on surrounding roads and to provide a minimum of 9 ha of open space.	Allocation is due to come forward 2019 - 2021. The cut-off date for the long list search for this Cumulative Effects assessment was 13 March 2018, however at the time of writing this chapter a planning application (OL/TH/18/0261 ^{iv}) was validated incorporating both of these allocated sites. The cumulative effects assessment of the planning application is, nonetheless, covered by the assessments for ID C and ID D in the technical topic assessments in Section 18.5 . This application is therefore not considered further.
D	Land west of Old Haine Road, Ramsgate - Housing Site Outside Urban Area Thanet District Council 1.38km from boundary	The site is allocated for 250 dwellings and is located on land to the west of Old Haine Road. Any development located on this site would be expected to provide infrastructure improvements to the surrounding roads, and especially Old Haine Road and to potential provide a new school.	
E	Land at Manston Road/Shottendane Road - Housing Site Outside Urban Area Thanet District Council 2.2km from boundary	The site is allocated for 250 dwellings and is located on land near to Manston Road and Shottendane Road. There are no specific requirements that would govern development on this site.	No planning application has been submitted to date. Allocation is due to come forward 2019 - 2021.
F	Land at Manston Tothill Street, Minster - Rural Site Thanet District Council 0.65km from boundary	The site is allocated for 150 dwellings and is located adjacent to Tothill Street. Any development located on this site would be required to provide infrastructure improvements to Tothill Street and potentially other roads in close proximity to the site. Furthermore, they would be required to provide some open space.	No planning application has been submitted to date. Allocation is due to come forward 2019 - 2021.
G	Land south side of Foxborough Lane - Rural Site Thanet District Council 0.90km from boundary	The site is allocated for 35 dwellings and is located on the land on the south side of Foxborough. Depending on the size of future developments on this site, developers might be expected to provide easily accessible community services.	No planning application has been submitted to date. Allocation is due to come forward 2019 - 2021.
H	Birchington - Strategic Site Thanet District Council 3.44km from boundary	The site is allocated for 1000 dwellings and is located at Birchington. Any development located on this site would have to provide a new link road from Minnis Road and the A28. It would also have to	No planning application has been submitted to date. Allocation is due to come forward 2019 - 2021.

^{iv} OL/TH/18/0261 is located at Land at Haine Road and Manston Court Road, Ramsgate, CT12 5AE. It covers the entirety of allocated sites ID C and ID D. The application is an outline application for a mixed development of up to 900 dwellings together with a mix of use classes A1 (retail) A2 (Financial and professional services) A3 (restaurants and cafe) A4 (drinking establishments) A5 (hot food takeaways) B1 (business) C1 (Hotel) D1 (non-residential institution) D2 (assembly and leisure) and a two form entry primary school, together with ancillary and associated development including new and enhanced pedestrian / cycle routes and open spaces, car parking and vehicular access with all matters reserved except for access.

ID	Development	Brief description	Status and programme
		provide 11 ha of open space and 2.05ha of land for a primary school. It would be expected to provide some small scale convenience retail.	

18.5 Assessment of Cumulative Effects

18.5.1 This section provides an assessment of cumulative effects for each of the 'other developments' outlined in **Table 18.4**. This assessment has been undertaken in accordance with the agreed approach outlined in **Section 18.2**. The criteria for assessing the likely cumulative effects take cognisance of:

- ▶ The duration of effect;
- ▶ The extent of effect;
- ▶ The type of effect;
- ▶ The frequency of effect;
- ▶ The 'value' and resilience of the receptor affected; and
- ▶ The likely success of incorporated mitigation.

18.5.2 Assessments are provided for each environmental topic below. However some of the assessments of cumulative effects have been embedded within the environmental topic ES Chapters. This is described in more detail under each topic heading in this Chapter and such instances are as follows:

- ▶ Air quality, with respect to increases in road traffic and the creation of new receptors which could potentially be affected by the Proposed Development;
- ▶ Noise, with respect to increases in road traffic;
- ▶ Traffic and transport, which uses future growth forecasts that inherently account for shortlisted developments; and
- ▶ Health and wellbeing, which takes account of the cumulative effects assessments within this Chapter for each environmental topic.

Assumptions

18.5.3 The following assumptions have been made in the assessment of cumulative effects:

- ▶ It is anticipated, as for the Proposed Development, that other proposed or committed developments will implement mitigation measures during their respective construction phases (such as through a Construction Environmental Management Plan) which will help to prevent or minimise adverse effects during construction and avoid potential cumulative effects should construction periods overlap with that of the Proposed Development;
- ▶ The assessment has been completed based on information relating to the committed developments which is available within the public domain;
- ▶ The assessment has not considered unplanned events; and
- ▶ Mitigation measures required to minimise or avoid likely significant negative environmental effects arising from the committed developments will be adopted as part of the implementation of these schemes.

Assessment of Cumulative Effects: Air Quality

- 18.5.4 The cumulative effects of the Proposed Development with other shortlisted developments have been considered and it is determined that none of the shortlisted developments are likely to result in significant sources of emissions to air.
- 18.5.5 It is possible that there may be cumulative effects on dust emissions if construction of the Proposed Development coincides with other developments very close to the airport site, but given that the construction of the Proposed Development will employ measures to ensure that there is no significant effect, and it is a common condition of planning consent for other developments to employ measures to ensure there is no significant effect on dust, this is unlikely.
- 18.5.6 The shortlisted developments may cause increases in road traffic, during their construction and after completion. These increases in road traffic are included in the baseline traffic model. Rather than trying to identify individual developments, which will cause very small increases, the traffic model includes the cumulative effect by means of conservative traffic growth forecasts (see **Chapter 14: Traffic and Transportation** for details). The extra emissions from these sources have therefore been included within the air quality modelling.
- 18.5.7 Some of the shortlisted developments will create new receptors (e.g. new housing developments) which could be affected by air quality changes during the construction and operation phase. These have been taken into consideration in the selection of receptors for the air quality assessment (see **Chapter 6: Air Quality, Section 4.6**). Therefore all shortlisted developments are covered by receptors and are therefore already considered in the air quality assessment.
- 18.5.8 Cumulative air quality effects as a result of other developments in the area are therefore anticipated to result in **no significant effects**.

Assessment of Cumulative Effects: Biodiversity

- 18.5.9 Only developments for which an identified potential significant cumulative effect could occur have been scoped in and assessed in terms of the effects on biodiversity. Each receptor scoped into the biodiversity assessment in **Chapter 7: Biodiversity** has been considered in terms of cumulative inter-project effects, and is discussed in the following sections.

Thanet Coast & Sandwich Bay Special Protection Areas (SPA)/Ramsar, Sandwich Bay to Hacklinge Marshes (SBHM) SSSI and Thanet Coast Sites of Special Scientific Interest (SSSI)

Golden plover: non-breeding

- 18.5.10 Other developments and plans within the local area also have the potential to adversely affect the SPA/SSSI population of golden plover due to habitat loss through land-take and disturbance. None of the developments and plans identified in the short list in **Table 18.4** are predicted to lead to the loss of potentially important areas of suitable foraging and roosting habitat (farmland) for golden plover that might be considered as functionally linked habitat to the SPA, due to land-take or disturbance to birds foraging or resting on adjacent farmland. These developments are not located in close vicinity to areas where important concentrations of golden plover are known to utilise farmland and therefore are not predicted to cause high levels of disturbance.
- 18.5.11 A number of developments and plans identified within the short list in **Table 18.4** however, include new residential housing, in particular ID 143 Manston Green (OL/TH/14/0050) and ID 150 Eurokent (OL/TH/11/0910) which each propose the construction of several hundred new homes. In addition, Thanet District Council have identified land for a further 4,875 dwellings in eight separate areas (IDs A-H, see **Figure 18.1** and **Table 18.4**), due to be brought forward between 2019 and 2021. These developments and plans have the potential to have an adverse effect on the designated sites due to increased disturbance from residents visiting these sites for recreational purposes. Disturbance to birds by dog walkers using Pegwell Bay has been highlighted as a major issue for the Thanet Coast and Sandwich Bay SPA/SBHM SSSI. This increased human disturbance also has the potential to adversely impact on golden plover roosting in Pegwell Bay.

- 18.5.12 For the European sites (underpinned by their constituent SSSIs), the Competent Authority must comply with Regulation 63 of the Habitats Regulations, as set out below: “63(5). *In the light of the conclusions of the assessment, and subject to regulation 64, the competent authority may agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the European site or the European offshore marine site (as the case may be).*”
- 18.5.13 If a project is likely to have an adverse effect on a European site (for example, due to disturbance to qualifying bird species due to increased numbers of residents visiting the SPA from a proposed new housing development), to comply with the Habitats Regulations, the applicant must provide a Habitats Regulation Assessment (HRA) report as part of the application documentation (see **Appendix 7.1** for more detailed explanation). The HRA report must show the European site(s) potentially affected, alongside sufficient information to enable the Secretary of State to make an appropriate assessment, if required. If applicable, this would need to include measures to mitigate against the effects of increased human disturbance to birds. Typically, such measures would include the provision of on-site green space (for dog walking etc.) and/or contribution to management measures within the European site (SPA) to reduce disturbance or control access.
- 18.5.14 The National Planning Policy Framework (NPPF)¹⁴ supports this legal consideration for European sites in regard formulation of local authority policy at Paragraph 166 as follows:
- “Local Plans may require a variety of other environmental assessments, including under the Habitats Regulations where there is a likely significant effect on a European wildlife site (which may not necessarily be within the same local authority area), Strategic Flood Risk Assessment and assessments of the physical constraints on land use. Wherever possible, assessments should share the same evidence base and be conducted over similar timescales, but local authorities should take care to ensure that the purposes and statutory requirements of different assessment processes are respected.”*
- 18.5.15 The SBHM SSSI is also notified for its non-breeding populations of golden plover, grey plover, ringed plover and sanderling and forms a constituent SSSI of the Thanet Coast and Sandwich Bay SPA. Paragraph 118 of the NPPF states:
- ▶ *“When determining planning applications, local planning authorities should aim to conserve and enhance biodiversity by applying the following principles:*
 - ▶ *if significant harm resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;*
 - ▶ *Proposed Development on land within or outside a Site of Special Scientific Interest likely to have an adverse effect on a Site of Special Scientific Interest (either individually or in combination with other developments) should not normally be permitted. Where an adverse effect on the site's notified special interest features is likely, an exception should only be made where the benefits of the development, at this site, clearly outweigh both the impacts that it is likely to have on the features of the site that make it of special scientific interest and any broader impacts on the national network of Sites of Special Scientific Interest;”*
- 18.5.16 Furthermore, in covering the pre-application stage the NPPF at Paragraph 192 states:
- “The right information is crucial to good decision-taking, particularly where formal assessments are required (such as Environmental Impact Assessment, Habitats Regulations Assessment and Flood Risk Assessment). To avoid delay, applicants should discuss what information is needed with the local planning authority and expert bodies as early as possible”.*
- 18.5.17 In view of the requirements of the NPPF and Habitats Regulations, any plans and planning applications for development, including those for new residential housing (such as those identified in the short list in **Table 18.4**) would be required to provide appropriate and suitable mitigation as

detailed above. For example, the Manston Green development, includes a strategy to contribute towards SPA management and monitoring; and provide additional natural green space / Suitable Alternative Natural Green Space (SANGS) within the site to mitigate against the effects of human disturbance to the Thanet Coast and Sandwich Bay SPA.

- 18.5.18 To conclude, it is predicted that there are **no significant effects** due to the cumulative effects of other developments and plans on the non-breeding golden plover population of these designated sites.

Turnstone: non-breeding

- 18.5.19 None of the proposed or consented developments and plans identified and listed in **Table 18.4** are predicted to lead to the loss of potentially important areas of suitable foraging and roosting habitat (intertidal mudflats and rocky shores) for turnstone. These developments and plans are either not located in close vicinity to areas where important concentrations of turnstone are known to occur, or are of a sufficiently small-scale (for example, ID 127 Little Cliffsend Farm industrial (2 units)), and therefore are not predicted to cause high levels of disturbance.
- 18.5.20 In view of the NPPF and Habitats Regulations (as detailed for golden plover), no cumulative effects due to increased visitor or other sources of disturbance to turnstone are predicted. To conclude, disturbance levels as a result of the considered developments and plans combined, are **not significant**.

Little tern: breeding

- 18.5.21 Other developments and plans within the local area also have the potential to adversely affect little tern to breed within the designated sites due to disturbance from aircraft. None of the proposed or consented developments and plans identified and listed in **Table 18.4** are sufficiently close to potential little tern nesting sites to directly result in disturbance.
- 18.5.22 A number of developments and plans identified within the short list however, include new residential housing, in particular ID 143 Manston Green (OL/TH/14/0050) and ID 150 Eurokent (OL/TH/11/0910) which each propose the construction of several hundred new homes. In addition, TDC have identified land for a further 4,875 dwellings in eight separate areas (IDs A-H, see **Figure 18.1** and **Table 18.4**), due to be brought forward between 2019 and 2021. These developments and plans have the potential to have an adverse effect on the nearby designated sites with bird interest due to increased disturbance from residents visiting these sites for recreational purposes. Disturbance to birds by dog walkers using Pegwell Bay has been highlighted as a major issue for the SBHM SSSI/Thanet Coast and Sandwich Bay SPA. This increased human disturbance also has the potential to adversely impact on little tern should the species attempt to breed around Pegwell Bay.
- 18.5.23 In view of the NPPF and Habitats Regulations (as detailed under golden plover), no cumulative effects due to increased visitor disturbance preventing little tern from re-colonising the SSSI/SPA are predicted. In view of this assessment, it is concluded that **no significant effects** on little tern are predicted.

Thanet Coast and Sandwich Bay SPA/Ramsar; Thanet Coast SAC; SBMH SSSI; Sandwich and Pegwell Bay NNR

- 18.5.24 None of the proposed or consented developments and plans identified and listed in **Table 18.4** are to discharge to Pegwell Bay. Therefore it is not envisaged that there will be any potentially significant effects on Pegwell Bay and any associated designated sites during the operational phase of the development. As such, it is concluded that for all developments, combined effects are predicted to be **not significant**.

Designated sites/priority habitats

- 18.5.25 The shortlisted projects are not expected to have appreciable air quality emissions in themselves. The air quality assessment, as presented in **Chapter 6: Air Quality**, is based upon the traffic model (see **Chapter 14: Traffic and Transport**). Additional traffic has been included in the traffic

model, which includes factors for growth in non-Airport traffic. There are no known other projects (as identified in **Table 18.4**) that would combine with the minimal effects of air quality predicted (and as discussed above and in **Chapter 6: Air Quality**) from the Proposed Development in such a way as would result in likely significant effects on the qualification or notification features of the designated nature conservation sites. The shortlisted developments are all located more than 1km from the nitrogen sensitive habitats of the designated sites (e.g. the dune habitats within the SAC/SSSI). Furthermore, Defra's Technical Guidance on Local Air Quality Management (Defra, 2009) states, in respect of NO₂, that "*concentrations fall-off rapidly on moving away from the source, and that beyond a distance of 1km from the source, NO₂ is unlikely to make a significant contribution to air quality*".

- 18.5.26 To conclude, effects on air quality (in the form of annual mean NO_x concentrations in air, nitrogen deposition and acidification) on the qualifying interest features of the nearby national or internationally designated nature conservation sites due to the Proposed Development and combined with other projects are considered **not significant**.

Bat assemblage

- 18.5.27 The construction and operational phases of the majority of the shortlisted developments are unlikely to result in significant cumulative effects. A number of developments identified within **Table 18.4** however, include new residential housing, in particular ID 143 Manston Green and ID 150 Eurokent which each propose the construction of several hundred new homes. When operational these might intensify the built development aspect of the Study Area. This has potential to have adverse impacts on bats due to higher levels of lighting and fragmentation of commuting routes. However, the ES for ID 143 Manston Green reports that following mitigation and enhancements a moderate positive effect on bats is anticipated¹⁵. With regard to ID 150, the site was considered not suitable to support bats¹⁶. In a similar respect, ID 174 St Stephen's which proposes 100 dwellings, includes measures¹⁷ to prevent excessive lighting or light spill to adequately mitigate potential negative effects. In addition, residential developments brings with it increased roosting opportunities with provision of bat boxes and also an increase in associated greenspace, which generally provides higher quality habitat for bats than conventional farmland. Therefore any cumulative effects are considered to be **not significant**.

Reptiles

- 18.5.28 None of the shortlisted developments are predicted to lead to the loss of significant areas of suitable reptile habitat. However, any potential direct effects (i.e. that might cause incidental injury/mortality) would require mitigation to ensure legal compliance. In view of this, combined effects are predicted to be **not significant**.

Breeding birds

- 18.5.29 None of the shortlisted developments are predicted to lead to the loss of significant areas of suitable foraging and nesting habitat for breeding birds with any conservation status (e.g. species of principal importance (SPI) or red-listed Birds of Conservation Concern (BoCC)). However, any potential direct effects (i.e. that might cause loss of active nests) would, without mitigation, result in adverse effects due to non-compliance with legislation. Application of the appropriate mitigation to prevent loss of active nests ensures legal compliance. In view of this, effects from all developments combined are predicted to be **not significant**.

Breeding barn owl

- 18.5.30 None of the shortlisted developments are predicted to lead to the loss of significant areas of suitable foraging habitat or nest sites for barn owl. Therefore the developments listed in **Table 18.4** can be scoped out from the cumulative effects assessment in relation to breeding barn owl.

Badger

- 18.5.31 None of the shortlisted developments are predicted to lead to the loss of significant areas of suitable foraging habitat or sett disturbance/destruction. Therefore the developments listed in **Table 18.4** can be scoped out from the cumulative effects assessment in relation to badger.

Terrestrial invertebrates/invertebrate assemblage

- 18.5.32 None of the shortlisted developments are predicted to lead to the loss of significant areas of suitable habitat for terrestrial invertebrates. Therefore the developments listed in **Table 18.4** can be scoped out from the cumulative effects assessment in relation to terrestrial invertebrates.

Assessment of Cumulative Effects: Freshwater Environment

- 18.5.33 Of the 35 shortlisted developments, 31 developments have been scoped out of the inter-project CEA for the freshwater environment. The developments have been scoped out based on their distance from the Proposed Development (i.e. the development is not within the freshwater study area or it is a sufficient distance away to prevent cumulative effects), and/or the scale and nature of the development (i.e. the development is unlikely to have significant interactions with the freshwater environment). The scoped out developments are listed in **Table 18.5**.

Table 188.5 Shortlisted developments scoped out of the freshwater environment cumulative assessment

ID	Application Reference	Brief Description	Justification
3	OL/TH/16/0967	Outline application for the erection of 12 detached dwellings with access via Southall Close including access, layout and scale. Land adjacent 15 Southall Close Minister Ramsgate Kent	Distance (250 m) and scale and nature of development (small infill housing development).
5	OL/TH/16/0417	Outline application for mixed use residential and business development comprising 19 dwellings, 4 live-work units, and a detached building incorporating a shop and café, together with associated access roads, paths and vehicle parking, including access and layout.	Distance (500 m) and scale and nature of development (small infill housing development).
13	OL/TH/15/0187	Outline application for the redevelopment of the existing site for up to 120 dwellings including access, following demolition of existing buildings	Distance (1 km) and nature of development (redevelopment of existing industrial site for residential use).
14	R/TH/15/0250	Westwood. Application for approval of access, appearance, landscaping, layout and scale pursuant to condition 1 of planning permission reference F/TH/12/0964 for the development of phase 5 of a mixed use urban extension comprising residential, community and commercial use, open space, infrastructure and new access. Total 469 houses and 1642m2 of non-residential development.	Distance (1.5 km) and nature of development (residential and commercial use).
15	OL/TH/15/0537	Outline application for the erection of 31 dwellings and retail unit, including access	Very close to the Proposed Development redline boundary, but only the buried pipeline to Pegwell Bay. Small infill residential and commercial development.
24	OL/TH/16/1416	Outline application for erection of 14No. detached dwellings including access, layout and scale	Distance (1 km) and scale and nature of development (small infill housing development).
29	OL/TH/16/1715	Outline application for 48 dwellings including access with all other matters reserved	Distance (750 m) and scale and nature of development (small infill housing development).
31	OL/TH/17/0151	Outline application for the erection of up to 41no. dwellings including access with all other matters reserved	Distance (600 m) and scale and nature of development (small infill housing development).

ID	Application Reference	Brief Description	Justification
32	OL/TH/17/0150	Outline application for the erection of up to 23no. dwellings including access with all other matters reserved. Land Adjacent To Oakland Court Cottingham Road	Distance (600 m) and scale and nature of development (small infill housing development).
33	OL/TH/17/0152	Outline Application for the erection of up to 62no. dwellings including access with all other matters reserved. Land East Of 40 Canterbury Road West	Located adjacent to the Proposed Development redline boundary, but small residential infill development.
81	16/00201	Scoping Opinion under the Environmental Impact Assessment Regulations 2011 (as amended) for the erection of a 305m high communications mast	Distance (4.7 km) and scale and nature of development (single communications mast).
138	N/A	Thanet Parkway Railway Station	Distance (200 m to discharge outfall and 500 m to main redline boundary) and scale and nature of development (railway station and car park).
150	OL/TH/11/0910	Eurokent, Westwood, Thanet. Application for outline planning permission for mixed-use development for up to 550 dwellings; up to 63,000sqm Class B1 business floorspace; car showroom; a new local centre comprising up to 2,000sqm convenience retail (class A1, A2, A3), community facilities up to 5,000 sqm (class D1/D2) and community healthcare up to 1,200sqm (class D1); and associated highway works with all matters reserved	Distance (1.5 km) and nature of development (large residential and retail development).
153	OL/TH/17/1763	Outline planning application for the erection of 22 dwellings including access	Distance (350 m) and scale and nature of development (small infill housing development).
156	F/TH/17/1589	Erection of 19No. general industrial units, associated parking and access road.	Distance (300 m) and scale and nature of development (small infill light industrial development).
166	F/TH/17/1063	Erection of 22 No. general industrial units, associated parking and access road.	Distance (300 m) and scale and nature of development (small infill light industrial development).
173	F/TH/16/1744	Erection of a 3 storey block containing 4No. Offices and 46No. General Industrial Units with associated parking and access road.	Distance (220 m) and scale and nature of development (small infill light industrial development).
174	OL/TH/16/1374	Application for outline planning permission for 100no. dwellings with creation of access on to Haine Road, and all other matters reserved, on land at and adjoining St Stephens Bungalow	Distance (900 m) and nature of development (large residential and retail development).
176	F/TH/17/1056	Change of use of land and existing buildings along with the erection of 4No industrial buildings for mixed use as use classes B1, B2 and B8 with associated landscaping bund and car parking areas	Redevelopment of existing light industrial site, which is predominantly hardstanding.
190	F/TH/18/0093	Erection of 9No. industrial units, together with associated external works	Distance (700 m) and scale and nature of development (small infill light industrial development).
191	F/TH/15/0592	Erection of 1no. 2-storey building, installation of 2no. test cells and relocating of existing test cells	Distance (700 m) and scale and nature of development (small infill light industrial development).
192	F/TH/17/1756	Erection of a concrete batching plant with workshop, office, storage units and concrete bays associated parking (Phase 1) together with erection of 10 commercial units with associated parking (Phase 2)	Distance (400 m) and scale and nature of development (small infill light industrial development).
193	F/TH/17/1169	Erection of 3No. general industrial units, 1No two storey office unit, access road and associated parking	Distance (500 m) and scale and nature of development (small infill light industrial development).

ID	Application Reference	Brief Description	Justification
A	N/A	Westwood - Allocated for 1450 dwellings - Strategic Site	Distance (1.8 km) and nature of development (large residential development).
B	N/A	Westgate-on-Sea - Allocated for 1000 dwellings - Strategic Site	Distance (2.3 km) and nature of development (large residential development).
C	N/A	Land at Manston Court Road/Haine Road - Allocated for 700 dwellings - Strategic Site	Distance (1 km) and nature of development (large residential development).
D	N/A	Land west of Old Haine Road, Ramsgate - Allocated for 250 dwellings - Housing Site Outside Urban Area	Distance (1.3 km) and nature of development (large residential development).
E	N/A	Land at Manston Road/Shottendane Road - Allocated for 250 dwellings - Housing Site Outside Urban Area	Distance (2.2 km) and nature of development (large residential development).
F	N/A	Tothill Street, Minster - Allocated for 150 dwellings - Rural Sites	Development extends to the Proposed Development redline boundary but nature of development (residential) is unlikely to result in cumulative effects
G	N/A	Land south side of Foxborough Lane - Allocated for 35 dwellings - Rural Sites	Distance (0.9 km) and scale and nature of development (small infill residential development).
H	N/A	Birchington - Allocated for 1000 dwellings - Strategic Site	Distance (3.4 km) and nature of development (large residential development).

18.5.34 The cumulative effects assessment for the remaining four shortlisted developments is presented in the following two sections.

Construction phase

ID: 127 Little Cliffsend Farm industrial (2 units)

18.5.35 Two new industrial units (planning reference F/TH/16/1417) will be constructed approximately 250 m to the east of the Proposed Development redline boundary that covers the buried pipeline to Pegwell Bay. The industrial units will be located approximately 750 m to the south-east of the Lord of the Manor Well 1 Public Water Supply (PWS) abstraction and within the inner source protection zone (SPZ1) for this abstraction, and within the Kent Isle of Thanet Chalk WFD groundwater body. It is also adjacent to Pegwell Bay and associated designated sites, and the Stour transitional WFD water body. If the construction works coincide in time with those for the Proposed Development (the construction period of the industrial units is currently unknown) the cumulative impact on the above named receptors could be greater than set out in the freshwater assessment included within this ES for short periods of time. However, conditions imposed on the planning permission by the Environment Agency would act to protect those receptors. In addition, the location of the industrial units is down groundwater gradient of the PWS abstraction (see **Figure 3.3 of Appendix 8.1 (Hydrogeological Risk Assessment)**), limiting the potential for migration of contaminants from the industrial units to the abstraction. Therefore it is considered that significant cumulative impacts are unlikely to arise and have been assessed as **negligible** and **not significant**.

ID 143: Manston Green residential (785 dwellings), infrastructure, community and commercial

18.5.36 The Manston Green development (planning reference OL/TH/14/0050) includes the construction of 785 dwellings, highways infrastructure works and community facilities immediately to the east of the Proposed Development site, also including the eastern extent of the Proposed Development

site. If the construction works for the two developments coincide in time (the construction period for Manston Green is unknown) the cumulative impact on PWS abstractions, WFD waterbodies, on and off-site users and infrastructure, and the on and off site public sewer and water supply infrastructure could be greater than set out in the freshwater assessment included within this ES. However, no significant construction will be undertaken in the area where the two developments overlap (this area will be used for landing lights only), and conditions imposed on the Manston Green planning permission will act to protect the receptors listed above. Therefore, it is considered that significant cumulative impacts are unlikely to arise and have been assessed as **negligible and not significant**.

18.5.37 ID 133: Thanet Extension Offshore Wind Farm

18.5.38 The Thanet Offshore Wind Farm extension (planning reference EN010084) requires onshore infrastructure comprising cable landfall, transition pit, underground cables, and onshore substation. The scoping report identifies two options for the onshore infrastructure, one of which is situated in Pegwell Bay. Construction of the onshore infrastructure (2020 – 2021) will coincide with Phase 1 of construction at the Proposed Development (2019 – 2021). The cumulative impact on the Stour transitional WFD water body, the Monkton and Minster Marshes WFD water body, and the Pegwell Bay (and associated designated sites) receptors could be greater than set out in the freshwater assessment included within this ES during construction of Phase 1. Environmental measures in the Proposed Development Construction Environment Management Plan (CEMP) and Code of Construction Practice (CoCP) will minimise effects of the development on the freshwater environment to a negligible, not significant level and it is anticipated that similar measures in the CEMP and CoCP for the Thanet Extension onshore works will do the same for that development. Construction activities for the Proposed Development are limited to the airport site, and are separated from the Thanet Extension onshore construction activities by approximately 0.55 km. Therefore it is considered that significant cumulative impacts are unlikely to arise and have been assessed as **negligible and not significant**.

ID 134: Richborough Connection Project

18.5.39 The Richborough Connection (planning reference EN020017) requires a 400 kV electricity transmission connection between Richborough and Canterbury. The developments includes construction of new 400 kV overhead line, removal of existing 132 kV overhead line, and other works such as localised diversions of existing 132 kV overhead line, and construction of access tracks etc. Construction is underway and due to be completed by summer 2021. This will coincide with Phase 1 of construction at the Proposed Development (2019 – 2021). As the Richborough Connection will be constructed through the Stour transitional WFD water body, and the Monkton and Minster Marshes WFD water body, the cumulative impact on these receptors could be greater than set out in the freshwater assessment included within this ES during construction Phase 1. However the freshwater assessment presented in the Richborough Connection ES concludes that with the environmental measures embedded in the scheme design, there will be no significant effects on the freshwater environment during the construction phase. Therefore it is considered that significant cumulative impacts are unlikely to arise and have been assessed as **negligible and not significant**.

All Developments Combined

18.5.40 Should all the shortlisted developments be constructed, and the construction periods coincide, the cumulative impact on freshwater environment receptors could be greater than set out in the freshwater assessment included within this ES. However, assuming that other projects adopt construction best practice measures and comply with the planning and permitting regimes, significant cumulative impacts are unlikely to arise and have been assessed as **negligible and not significant**.

Operation phase

ID: 127 Little Cliffsend Farm industrial (2 units)

- 18.5.41 Two new industrial units (planning reference F/TH/16/1417) will be constructed approximately 250 m to the east of the Proposed Development redline boundary that covers the buried pipeline to Pegwell Bay. This is approximately 750 m to the south-east of the Lord of the Manor Well 1 PWS abstraction and within the inner source protection zone (SPZ1) for this abstraction, and within the Kent Isle of Thanet Chalk WFD groundwater body. It is also adjacent to Pegwell Bay and associated designated sites, and the Stour transitional WFD water body. The proposed use includes fuel, oil and chemical storage which could result in a cumulative impact on the above named receptors greater than set out in the freshwater assessment included within this ES. However, conditions imposed on the industrial unit planning permission by the Environment Agency will act to protect those receptors. In addition, the location of the industrial units is down groundwater gradient of the PWS abstraction (see **Figure 3.3 of Appendix 8.1 (Hydrogeological Risk Assessment)**), limiting the potential for migration of contaminants from the industrial units to the abstraction. Therefore it is considered that significant cumulative impacts are unlikely to arise and have been assessed as **negligible** and **not significant**.

ID 143: Manston Green residential (785 dwellings), infrastructure, community and commercial

- 18.5.42 The Manston Green development (planning reference OL/TH/14/0050) includes the construction of 785 dwellings, highways infrastructure works and community facilities immediately to the east of the Proposed Development site, also including the extreme eastern extent of the Proposed Development site. There is limited scope for operational effects on the surface water environment assuming the Manston Green development adopts drainage design as required by the planning and permitting regimes. Therefore it is considered that significant cumulative impacts are unlikely to arise and have been assessed as **negligible** and **not significant**.

ID 133: Thanet Extension Offshore Wind Farm

- 18.5.43 The Thanet Offshore Wind Farm extension (planning reference EN010084) requires onshore infrastructure comprising cable landfall, transition pit, underground cables, and onshore substation. The scoping report identifies two options for the onshore infrastructure, one of which is situated in Pegwell Bay. There is limited scope for operational effects on the surface water environment assuming the Thanet Extension onshore development adopts drainage design as required by the planning and permitting regimes. Therefore it is considered that significant cumulative impacts are unlikely to arise and have been assessed as **negligible** and **not significant**.

ID 134: Richborough Connection Project

- 18.5.44 The Richborough Connection (planning reference EN020017) requires a 400 kV electricity transmission connection between Richborough and Canterbury. The developments includes construction of new 400 kV overhead line, removal of existing 132 kV overhead line, and other works such as localised diversions of existing 132 kV overhead line, and construction of access tracks etc. Construction is underway and due to be completed by summer 2021. The freshwater assessment presented in the Richborough Connection ES concludes that once constructed, the effects on the water environment of the new infrastructure would be negligible. Therefore it is considered that significant cumulative impacts are unlikely to arise and have been assessed as **negligible** and **not significant**.

All Developments Combined

- 18.5.45 Should all the shortlisted developments be constructed, there will be a significant increase in population (the shortlisted developments include in the order of 7000 new residential dwellings). The cumulative impact on the PWS infrastructure and the on- and off-site public sewer network could be greater than set out in the freshwater assessment included within this ES. However, the Proposed Development site will not make a significant contribution to the cumulative impact due to the implementation of environmental measures (refer to **Section 8.11.6**) to ensure the impact on these receptors from the Proposed Development is **negligible** and **not significant**.

Assessment of Cumulative Effects: Historic Environment

- 18.5.46 The majority of developments identified on a project level and having the potential to give rise to cumulative effects would have, in terms of the historic environment, relatively localised effects which would not interact with the effects predicted to arise from the Proposed Development. There are no cases where potential cumulative direct effects have been identified. Where the potential for a cumulative indirect effect has been identified, this has been considered in more detail below. Proposed developments with a larger area of influence, include the Richborough Connection, which is considered below and Thanet Extension offshore Wind Farm. In the case of Thanet Extension, the onshore works and offshore turbines would not be visible with sufficient prominence to give rise to any cumulative adverse effects to receptors identified in this ES.

Construction Phase

ID 1: Southall Close residential (12 dwelling)

- 18.5.47 This outline development (planning reference OL/TH/16/0967) is located approximately 250 metres from Grade II Prospect Inn and construction noise has the potential to cause a temporary change in setting. There is no visibility between the asset and the development due to intervening structures, and the relationship of Prospect Inn with its present setting would not be otherwise affected. Owing to the relatively short period of construction of these developments, any effects would be temporary and of a limited duration, and would present very limited qualitative change to the existing setting. Consequently, cumulative effects are assessed as **negligible** and **not significant**.

ID 5: Manston Green residential (19 dwellings), live-work and shop/café

- 18.5.48 Construction noise and lighting of construction of a mixed use residential and business development adjacent to the northern edge of Manston (planning reference OL/TH/16/0417) has the potential to cause a change in setting to the Manston Conservation Area and associated listed buildings. Visual impact is limited due to vegetation. Owing to the relatively short period of construction of these developments any effects would be of a limited duration. Consequently, cumulative effects are assessed as **negligible** and **not significant**.

ID 156: Manston Business Park industrial (19 units); ID 166: Manston Business Park industrial (22 units); ID 173: Manston Business Park business and industrial (46 units); ID 190: The Loop industrial (9 units); ID 192: Invicta Way batching plant and commercial (10 units); and ID 193: Columbus Avenue industrial (3 units) and office

- 18.5.49 Construction noise and lighting of construction of industrial and commercial units on land at Manston Business Park (planning references F/TH/17/1589, F/TH/17/1063, F/TH/16/1744, F/TH/18/0093, F/TH/17/1756 and F/TH/17/1169) has the potential to cause a change in setting to Grade II Cleve Lodge and Cleve Court. No visual impact is anticipated due to screening by intervening planting, and these works would represent an incremental change to the existing industrial use, meaning that any qualitative change to setting would be minimal. Owing to the relatively short period of construction of these developments, any effects would be of a limited duration. Consequently, cumulative effects are assessed as **negligible** and **not significant**.

ID 191: Cummins Power Generation test cells

- 18.5.50 Construction noise and lighting during construction of a 2-storey building, installation of two test cells and relocating of existing test cells (planning reference F/TH/15/0592) has the potential to cause a change in setting to Grade II Cleve Lodge and Cleve Court. No visual impact is anticipated due to screening by intervening planting, and these works would represent an incremental change to the existing industrial use, meaning that any qualitative change to setting would be minimal. Owing to the relatively short period of construction of this developments, any effects would be of a limited duration. Consequently, cumulative effects are assessed as **negligible** and **not significant**.

All Developments Combined

- 18.5.51 Should all the shortlisted developments be constructed, and the construction periods coincide, the cumulative impact on the historic environment receptors could be greater than set out in the historic environment assessment included within this ES. However, owing to the relatively short period of construction of these developments and assuming that other projects adopt construction best practice measures and comply with the planning and permitting regimes, significant cumulative impacts are unlikely to arise and have been assessed as **negligible** and **not significant**.

Operational Phase

ID 1: Southall Close residential (12 dwelling)

- 18.5.52 Any change resulting from the operation of a mixed use residential and business development adjacent to the northern edge of Manston (planning reference OL/TH/16/0417) would represent a minor and incremental change in the setting of the conservation area and is not anticipated to give rise to any discernible change to setting. Consequently, cumulative effects are assessed as **negligible** and **not significant**.

ID 156: Manston Business Park industrial (19 units); ID 166: Manston Business Park industrial (22 units); ID 173: Manston Business Park business and industrial (46 units); ID 190: The Loop industrial (9 units); ID 192: Invicta Way batching plant and commercial (10 units); and ID 193: Columbus Avenue industrial (3 units) and office

- 18.5.53 Operational noise and lighting of industrial and commercial units on land at Manston Business Park (planning references F/TH/17/1589, F/TH/17/1063, F/TH/16/1744, F/TH/18/0093, F/TH/17/1756 and F/TH/17/1169) has the potential to cause change in setting to Cleve Lodge and Cleve Court. No visual impact is anticipated due to vegetation. These developments are within industrial areas and would represent a continuation of the existing industrial use. The change would be **minor adverse** and **not significant**.

ID 191: Cummins Power Generation test cells

- 18.5.54 Operational noise and lighting following construction of a 2-storey building, installation of two test cells and relocating of existing test cells (planning reference F/TH/15/0592) has the potential to cause a change in setting to Grade II Cleve Lodge and Cleve Court. No visual impact is anticipated due to vegetation screening and as the development is within an industrial area, it would represent a continuation of the existing industrial use. The change would be **minor adverse** and **not significant**.

ID 134: Richborough Connection Project

- 18.5.55 Pylons associated with this development (planning reference EN020017) have the potential to result in a cumulative effect concerning medium to long distance views from Grade I Richborough Fort and associated Grade II buildings. The magnitude of this change is limited, and the pylons would be seen in the context of existing overhead lines and electricity transmission infrastructure around Richborough Energy Park. Visibility of aviation operations at a distance beyond the proposed overhead line would represent a very limited change to setting and consequently, cumulative effects are assessed as **negligible** and **not significant**.

ID 138: Thanet Parkway Railway Station

- 18.5.56 Located to the south of Manston Airport, a new railway station (due for planning application submittal in 2018) has the potential to result in a cumulative effect concerning long distance views, including an increase in visibility of light in night time views from Richborough Castle and associated remains (both scheduled and listed). The proposed development is near to an existing residential estate and at the distance involved, would represent a minor change to the existing long distance view from Richborough Roman Fort. Consequently, cumulative effects are assessed as **negligible** and **not significant**.
- 18.5.57 This development would also be close to the scheduled Anglo-Saxon Cemetery south of Ozengell Grange, and would intervene in views towards the Proposed Development. Any change to setting in this case would arise primarily as a result of the construction of the proposed railway station and

visual and audible change arising from the construction and operation of the airport would make a limited contribution to any adverse change. Consequently, cumulative effects are assessed as **negligible** and **not significant**.

All Developments Combined

- 18.5.58 Should all the shortlisted developments be constructed, they would cumulatively represent a minor visual change in the landscape and minor increase in levels of noise and light pollution. The cumulative impact could be greater than set out in the historic environment assessment included within this ES. However, the Proposed Development site will not make a significant contribution to the cumulative impact due to the implementation of environmental measures (refer to **Section 9.10**) to ensure the impact on these receptors from the Proposed Development is **negligible** and **not significant**.

Assessment of Cumulative Effects: Land Quality

- 18.5.59 Of the 35 shortlisted developments, 24 developments have been scoped out of the inter-project cumulative effects assessment for land quality. The developments have been scoped out based on their distance from the Proposed Development (i.e. the development is not within the land quality area or it is sufficient distance away to prevent cumulative effects), and/or the location of the development (i.e. groundwater cross/downgradient). The scoped out and in developments are listed in **Table 18.6** below:

Table 18.6 Shortlisted developments scoped out and scoped in of the land quality cumulative assessment

ID	Application Reference	Brief Description	Justification
3	OL/TH/16/0967	Outline application for the erection of 12 detached dwellings with access via Southall Close including access, layout and scale. Land adjacent 15 Southall Close Minister Ramsgate Kent	Scoped out: Distance and location 250 m south and groundwater downgradient of the site
5	OL/TH/16/0417	Outline application for mixed use residential and business development comprising 19 dwellings, 4 live-work units, and a detached building incorporating a shop and café, together with associated access roads, paths and vehicle parking, including access and layout.	Scoped in for construction and operation phase: 500 m north east of the site (groundwater upgradient)
13	OL/TH/15/0187	Outline application for the redevelopment of the existing site for up to 120 dwellings including access, following demolition of existing buildings	Scoped out: Distance 1 km east of the site
14	R/TH/15/0250	Westwood. Application for approval of access, appearance, landscaping, layout and scale pursuant to condition 1 of planning permission reference F/TH/12/0964 for the development of phase 5 of a mixed use urban extension comprising residential, community and commercial use, open space, infrastructure and new access. Total 469 houses and 1642m ² of non-residential development.	Scoped out: Distance 1.5 km northeast of the site
15	OL/TH/15/0537	Outline application for the erection of 31 dwellings and retail unit, including access	<p>Scoped out for construction phase: No construction works planned for the Proposed Development at the outfall pipeline.</p> <p>Scoped in for operational phase: Very close to the Proposed Development red line boundary (at the outfall pipeline)</p>

ID	Application Reference	Brief Description	Justification
24	OL/TH/16/1416	Outline application for erection of 14No. detached dwellings including access, layout and scale	Scoped out: Location 440 m southeast of the site groundwater cross gradient
29	OL/TH/16/1715	Outline application for 48 dwellings including access with all other matters reserved	Scoped out: Distance 750 m east-northeast of the site
31	OL/TH/17/0151	Outline application for the erection of up to 41no. dwellings including access with all other matters reserved	Scoped out: Distance and location 600 m to the south of the site groundwater cross/down gradient
32	OL/TH/17/0150	Outline application for the erection of up to 23no. dwellings including access with all other matters reserved. Land Adjacent To Oakland Court Cottington Road	Scoped out: Distance and location 600 m to the south of the site groundwater cross/down gradient
33	OL/TH/17/0152	Outline Application for the erection of up to 62no. dwellings including access with all other matters reserved. Land East Of 40 Canterbury Road West	Scoped in for construction phase and operational phase: Located adjacent to the Proposed Development red line boundary
81	16/00201	Scoping Opinion under the Environmental Impact Assessment Regulations 2011 (as amended) for the erection of a 305m high communications mast	Scoped out: Distance 4.7 km to the south of the site
127	F/TH/16/1417	Erection of two new Industrial Units for B8 use for Storage and Distribution	Scoped out: Distance about 1 km south-east of the main site boundary
133	EN010084	Thanet Extension Offshore Wind Farm. A offshore wind generating station of capacity up to 340 MW	Scoped out: Location and distance about 550 m south of the outfall pipeline
134	EN020017	Richborough Connection. Proposed 400kV electricity transmission connection between Richborough and Canterbury in Kent to connect the proposed new UK to Belgium interconnector (Known as a Nemo Link).	Scoped out: Distance 2.89 km of the site
138	N/A	Thanet Parkway Railway Station	Scoped out: Distance and location 200 m southwest of outfall pipeline and 500 m to main red line boundary
143	OL/TH/14/0050	Application for outline planning permission including access for the erection of 785 dwellings, highways infrastructure works (including single carriageway link road), primary school, small scale retail unit, community hall, public openspace.	Scoped in for construction phase and operational phase: Located immediately adjacent and slightly within the red line boundary (groundwater up/crossgradient).
150	OL/TH/11/0910	Eurokent, Westwood, Thanet. Application for outline planning permission for mixed-use development for up to 550 dwellings; up to 63,000sqm Class B1 business floorspace; car showroom; a new local centre comprising up to 2,000sqm convenience retail (class A1, A2, A3), community facilities up to 5,000 sqm (class D1/D2) and community healthcare up to 1,200sqm (class D1); and associated highway works with all matters reserved	Scoped out: Distance 1.5 km northeast of the site

ID	Application Reference	Brief Description	Justification
153	OL/TH/17/1763	Outline planning application for the erection of 22 dwellings including access	Scoped in for construction phase and operational phase: Located 350 m to the Proposed Development red line boundary
156	F/TH/17/1589	Erection of 19No. general industrial units, associated parking and access road.	Scoped in for construction phase and operational phase: Located 310 m to the Proposed Development red line boundary
166	F/TH/17/1063	Erection of 22 No. general industrial units, associated parking and access road.	Scoped in for construction phase and operational phase: Located 310 m to the Proposed Development red line boundary
173	F/TH/16/1744	Erection of a 3 storey block containing 4No. Offices and 46No. General Industrial Units with associated parking and access road	Scoped in for construction phase and operational phase: Located 220 m to the Proposed Development red line boundary
174	OL/TH/16/1374	Erection of 100no. dwellings with creation of access on to Haine Road, and all other matters reserved,	Scoped out: Distance located 860 m east of the Proposed Development red line boundary.
176	F/TH/17/1056	Change of use of land and existing buildings along with the erection of 4No industrial buildings for mixed use as use classes B1, B2 and B8 with associated landscaping bund and car parking areas	Scoped in for construction phase and operational phase: Located 20 m northwest to the Proposed Development red line boundary
190	F/TH/18/0093	Erection of 9No. industrial units, together with associated external works	Scoped out: Distance as located 650 m west to the Proposed Development red line boundary.
191	F/TH/15/0592	Erection of 1no. 2-storey building, installation of 2no. test cells and relocating of existing test cells	Scoped out: Distance as located 650 m west to the Proposed Development red line boundary
192	F/TH/17/1756	Erection of a concrete batching plant with workshop, office, storage units and concrete bays associated parking (Phase 1) together with erection of 10 commercial units with associated parking (Phase 2)	Scoped in for construction phase and operational phase: Located 360 m west to the Proposed Development red line boundary.
193	F/TH/17/1169	Erection of 3No. general industrial units, 1No two storey office unit, access road and associated parking	Scoped in for construction phase and operational phase: Located 490 m west to the Proposed Development red line boundary.
A	N/A	Westwood - Allocated for 1450 dwellings - Strategic Site	Scoped out: Distance 1.8 km northeast of the site
B	N/A	Westgate-on-Sea - Allocated for 1000 dwellings - Strategic Site	Scoped out: Distance 2.35 km north of the site

ID	Application Reference	Brief Description	Justification
C	N/A	Land at Manston Court Road/Haine Road - Allocated for 700 dwellings - Strategic Site	Scoped out: Distance 1.05 km northeast of the site
D	N/A	Land west of Old Haine Road, Ramsgate - Allocated for 250 dwellings - Housing Site Outside Urban Area	Scoped out: Distance 1.38 km northeast of the site
E	N/A	Land at Manston Road/Shottendane Road - Allocated for 250 dwellings - Housing Site Outside Urban Area	Scoped out: Distance 2.2 km west of the site
F	N/A	Tothill Street, Minster - Allocated for 150 dwellings - Rural Sites	Scoped out: Distance and location 650 m southwest of the site
G	N/A	Land south side of Foxborough Lane - Allocated for 35 dwellings - Rural Sites	Scoped out: Distance 900 m southwest of the site
H	N/A	Birchington - Allocated for 1000 dwellings - Strategic Site	Scoped out: Distance 3.4 km west of the site

Construction phase

ID 33: 40 Canterbury Road West residential (62 dwellings); ID 143: Manston Green residential (785 dwellings), infrastructure, community and commercial; ID 173: Manston Business Park business and industrial (46 units); ID 192 Invicta Way batching plant and commercial (10 units); and ID 193: Columbus Avenue industrial (3 units) and office

- 18.5.60 If the construction works for any of the above developments coincide in time with the Proposed Development, the cumulative impact on both on- and off-site users, controlled waters and infrastructure, could be greater than set out in the land quality assessment included within this ES (**Chapter 10: Land Quality**).
- 18.5.61 Assessment has been carried out for each of these sites as follows:
- ▶ ID 33: A phase 1 desk assessment¹⁸ had been carried out which indicated there were no potential onsite contamination sources that could be identified at the proposed development;
 - ▶ ID 143: The ES for this development identified the potential for contamination to exist¹⁹;
 - ▶ ID 173: A geoenvironmental risk assessment²⁰ had been carried out which indicated that the site poses very low risks to potential receptors at the proposed development;
 - ▶ ID 192: A Phase 1 report²¹ had been carried out which indicated that the scope of investigation was too limited to be able to provide an indication of ground conditions across the site. It was recommended that further site investigation be carried out at the proposed development;
 - ▶ ID 193: The results of the ground investigation²² carried out at this site have shown that there are no significant sources of contamination. Measured concentrations of potential contaminants are below the adopted screening values. In accordance with the appointed consultant's Methodology for Assessment of Potentially Contaminated Land the hazard potential for significant site wide contamination to be present at the site is low.
- 18.5.62 It is assumed that the schemes would be required to undertake investigation, remediation and groundwater protection measures to avoid creation of pathways, as necessary prior to construction. It is also assumed these will be in line with the Thanet Local Plan (2006) (Saved Policies) and comply with all statutory processes for managing the decontamination of land. The basements that are planned to be built as part of the development scheme ID 143 are not anticipated to result in

any combined effects with the Proposed Development in respect of groundwater (groundwater migration, change of groundwater level) given that they would be located within raised ground floors.

- 18.5.63 Therefore it is considered that significant cumulative impacts from these sites are unlikely to arise and have been assessed as **negligible** and **not significant**.

ID 5: Manston Green residential (19 dwellings), live-work and shop/café; ID 153: Manston Court residential (22 dwellings); ID 156: Manston Business Park industrial (19 units); ID 166: Manston Business Park industrial (22 units); and ID 176: Mushroom Farm industrial (4 units)

- 18.5.64 If the construction works for the one of the developments coincide in time with the Proposed Development, the cumulative impact on on- and off-site users, controlled waters and infrastructure, could be greater than set out in the land quality assessment included within this ES. However it is assumed that the schemes would be required to undertake investigation, remediation and groundwater protection measures to avoid creation of pathways, as necessary prior to construction. It is also assumed these will be in line with the Thanet Local Plan (2006) (Saved Policies) and comply with all statutory processes for managing the decontamination of land. Therefore it is considered that significant cumulative impacts are unlikely to arise and have been assessed as **negligible** and **not significant**.

All Developments Combined

- 18.5.65 When considering the cumulative impact of all shortlisted developments, together with the Proposed Development, it is not expected that there will be significant effects as it is assumed that all schemes would be required to undertake investigation, remediation and groundwater protection measures to avoid creation of pathways, as necessary prior to construction.

Operation phase

ID 33: 40 Canterbury Road West residential (62 dwellings); ID 143: Manston Green residential (785 dwellings), infrastructure, community and commercial; ID 173: Manston Business Park business and industrial (46 units); ID 192: Invicta Way batching plant and commercial (10 units); and ID 193: Columbus Avenue industrial (3 units) and office

- 18.5.66 As stated above, assessments have been carried out for each of these shortlisted development sites. It is assumed that the schemes would be required to undertake investigation, remediation and groundwater protection measures to avoid creation of pathways, as necessary prior to construction. Therefore it is not anticipated that there will be any combined effects providing that environmental measures have been implemented for the operational phase of the development scheme. Therefore it is considered that significant cumulative impacts are unlikely to arise and have been assessed as **negligible** and **not significant**.

ID 5: Manston Green residential (19 dwellings), live-work and shop/café; ID 15: Cliffsend Farm Cottages residential (31 dwellings) and retail; ID 153: Manston Court residential (22 dwellings); ID 156: Manston Business Park industrial (19 units); ID 166: Manston Business Park industrial (22 units); and ID 176: Mushroom Farm industrial (4 units)

- 18.5.67 No phase 1 desk assessment were found available for review. However, it is assumed that the schemes would be required to undertake investigation, remediation and groundwater protection measures to avoid creation of pathways prior to construction. It is not anticipated that there will be any combined effects providing that environmental measures have been implemented for the operational phase of the development schemes. Therefore it is considered that significant cumulative impacts are unlikely to arise and have been assessed as **negligible** and **not significant**.

All Developments Combined

- 18.5.68 When considering the cumulative impact of all shortlisted developments, together with the Proposed Development, it is not expected that there will be significant effects during the operational phase as it is assumed that all schemes would be required to undertake investigation,

remediation and groundwater protection measures to avoid creation of pathways, as necessary prior to construction.

Conclusion

Construction Phase

- 18.5.69 It is assumed that all cumulative schemes would be required to undertake investigation, remediation and groundwater protection measures to avoid creation of pathways. It is also assumed these will be in line with the Thanet Local Plan (2006) (Saved Policies) and comply with all statutory processes for managing the decontamination of land. Collectively, the cumulative schemes should therefore lead to a reduced level of contamination risk presently associated with the Development which would be a minor beneficial effect to all receptors (human receptors, groundwater, coastal waters, agricultural soils and building and services). The basements that are planned to be built as part of ID 143 are not anticipated to result in any combined effects with the Proposed Development in respect of groundwater (groundwater migration, change of groundwater level) given that they would be located within raised ground floors. No specific cumulative effects have therefore been identified associated with soil and groundwater contamination and any of the cumulative schemes. The cumulative impact have been assessed as **not significant**.

Operational Phase

- 18.5.70 It is not anticipated that there will be any combined effects providing that environmental measures have been implemented for each development schemes.

Assessment of Cumulative Effects: Landscape and Visual

- 18.5.71 The shortlist of developments to be considered in relation to the contribution they could make to potential cumulative effects arising as a result of the Proposed Development identified 35 developments within the Landscape and Visual Impact Assessment (LVIA) study area. Of these 35 sites, eight relate to strategic housing allocations for which no development proposals are available to enable a Cumulative Landscape and Visual Impact Assessment (CLVIA) to be undertaken. The strategic housing allocation sites are therefore excluded from the CLVIA. Similarly, no development proposals are available to enable a CLVIA to be undertaken for the proposed Thanet Parkway Railway Station (Development 138) and this is therefore excluded from the CLVIA.
- 18.5.72 The remaining 26 shortlisted developments are considered to have the potential to contribute to cumulative effects in combination with the proposed development and are included in the CLVIA.
- 18.5.73 The potential for receptors to sustain landscape or visual effects as a result of the development of any of the shortlisted sites is highly dependent upon the location and nature of each development included in the CLVIA. In order to keep the CLVIA to a manageable length, the shortlisted sites included in the CLVIA have been grouped into Cumulative Development Groups, according to their location and nature, with each group therefore containing developments that are likely to affect the same sub-set of receptors. The Cumulative Development Groups used in the CLVIA are as follows:
- ▶ Cumulative Development Group 1: ID 3 only (housing development to the immediate south-west of the Proposed Development);
 - ▶ Cumulative Development Group 2: ID 153, ID 156, ID 166, ID 173, ID 190, ID 191, ID 192 and ID 193 (predominantly industrial and commercial development to the immediate north-west of the Proposed Development);
 - ▶ Cumulative Development Group 3: ID 5 only (housing development to the immediate north-east of the Proposed Development);
 - ▶ Cumulative Development Group 4: ID 13, ID 24, ID 29, ID 127, ID 143 and ID 174 (predominantly housing development to the immediate east of the Proposed Development);

- ▶ Cumulative Development Group 5: ID 15, ID 31, ID 32 and ID 33 (housing development to the immediate south-east of the Proposed Development);
- ▶ Cumulative Development Group 6: ID 14 and ID 150 (housing and retail development to the north-east of the Proposed Development);
- ▶ Cumulative Development Group 7: ID 81, ID 133 and ID 134 (power transmission and communications infrastructure to the south of the Proposed Development); and
- ▶ Cumulative Development Group 8: ID 176 (predominantly industrial development to the immediate west of the Proposed Development).

18.5.74 In order to have the potential to sustain cumulative effects a receptor must be, as a minimum, within the Zol of both the Proposed Development and the Zol of one of the groups of developments included in the CLVIA. The Zol of the Proposed Development has been defined as the LVIA study area (i.e. all areas within 5km of the Proposed Development) and the extent of the Zone of Theoretical Visibility (ZTV) of the Proposed Development within that study area.

18.5.75 The Zols of each of the Cumulative Development Groups included in the CLVIA have been defined according to the maximum distance over which the predominant type of development within each group might reasonably be expected to give rise to a low magnitude of change. It is not considered that a development that may give rise to a negligible magnitude of change would have the potential to result in a significant level of cumulative effect in combination with the Proposed Development. These Zol distances have been informed by previous experience of undertaking LVIA's for similar types of development and calibrated for local conditions using the viewpoint analysis provided in **Appendix 11.3**. The Zol for each group is as follows:

- ▶ Cumulative Development Group 1, housing development: 2.5km;
- ▶ Cumulative Development Group 2, predominantly industrial and commercial development: 5km;
- ▶ Cumulative Development Group 3, housing development: 2.5km;
- ▶ Cumulative Development Group 4, predominantly housing development: 2.5km;
- ▶ Cumulative Development Group 5, housing development: 2.5km;
- ▶ Cumulative Development Group 6, housing and retail development: 2.5km;
- ▶ Cumulative Development Group 7, power transmission and communications infrastructure: 10km; and
- ▶ Cumulative Development Group 8, predominantly industrial development: 5km.

18.5.76 When referring to the construction and operational periods in the CLVIA and to align with the assessment in **Chapter 11: Landscape and Visual Impact Assessment**, the construction period primarily relates to Year 1 (although construction activity would continue up until Year 18) whilst the operational period relates to Year 10 and Year 20.

18.5.77 The visual receptor groups referred to in the CLVIA, such as 'residential receptor group 22' and PRow 'TR24', are defined in **Chapter 11: Landscape and Visual Impact Assessment**.

Landscape effects

Cumulative Development Group 1

18.5.78 This Cumulative Development Group comprises a small residential infill development on the north-eastern edge of Minster and would not generate more than a negligible magnitude of landscape change upon its host Landscape Character Area (LCA), A1: Manston Chalk Plateau. This is a fragmented landscape which is assessed as being of low sensitivity to change and this minor extension to the existing settlement would not alter the existing character and key characteristics of

this landscape or any other LCA within the Zol of Cumulative Development Group 1 (i.e. the adjacent LCA B1: Wantsum North Slopes). The assessment of landscape effects for each receptor (as set out in **Chapter 11: Landscape and Visual Impact Assessment**) would therefore remain unchanged during both the construction and operational periods.

Cumulative Development Group 2

- 18.5.79 This Cumulative Development Group consists of industrial or commercial development to the east of the Manston Business Park access road and a relatively small residential infill development to the immediate north of residential receptor group 37 (which is described in **Chapter 11: Landscape and Visual Impact Assessment**) on Manston Road. The eight developments are located within two LCAs; LCA A1: Manston Chalk Plateau and LCA C2: Central Thanet Undulating Chalk Farmland.
- 18.5.80 The location of these developments adjacent to existing developments of the same type and comparable scale represents an incremental change which would not substantially alter the landscape within the Zol for this development group where urbanising influences are already present. As such it is considered that the developments within this group would give rise to no more than a negligible magnitude of landscape change. The assessment of landscape effects for each receptor considered in **Chapter 11: Landscape and Visual Impact Assessment** and within the Zol of Cumulative Development Group 2 would therefore remain unchanged during both the construction and operational periods.

Cumulative Development Group 3

- 18.5.81 This relatively small residential infill development on the north-eastern edge of Manston is located within LCA A1: Manston Chalk Plateau and its location adjacent to the existing settlement limits the potential for this development to affect the character or key characteristics of this LCA or any other LCAs which fall within the Zol for this Cumulative Development Group. As such, the assessment of landscape effects set out in **Chapter 11: Landscape and Visual Impact Assessment** for each receptor would remain unchanged during both the construction and operational periods.

Cumulative Development Group 4

- 18.5.82 The six residential developments included in this group, if all taken forward, would represent a substantial urban extension on the western edge of Ramsgate. ID 13, ID 29 and the majority of the largest development, ID 143, lie within a landscape defined in the *Thanet Landscape Character Assessment*²³ as 'urban' with no corresponding description or set of key characteristics. ID 174 and the northern most part of ID 143 lie within the eastern most fringes of LCA A1: Manston Chalk Plateau whilst ID 24 and ID 127 lie within LCA B1: Wantsum North Slopes.
- 18.5.83 The developments closest to Ramsgate would represent an encroachment of urban development into the urban fringe landscape to the west of this coastal conurbation although this is a landscape already influenced by the adjoining built form and busy A256 Haine Road. The urbanising role of this development would continue west across the Proposed Development where medium to high magnitudes of landscape change are predicted in **Chapter 11: Landscape and Visual Impact Assessment**. The low sensitivity of this landscape means that the assessment of landscape effects for each receptor set out in **Chapter 11: Landscape and Visual Impact Assessment** would remain unchanged during both the construction and operational periods and significant cumulative landscape effects would not arise.
- 18.5.84 For the two developments located within LCA B1: Wantsum North Slopes, their scale and proximity to existing development of a comparable type and scale limits the potential for landscape effects to generate more than a negligible magnitude of change. As such, the assessment of landscape effects for this landscape receptor set out in **Chapter 11: Landscape and Visual Impact Assessment** would remain unchanged during both the construction and operational periods.

Cumulative Development Group 5

- 18.5.85 The four developments included in Group 5, if all taken forward, would introduce over 150 dwellings clustered around the periphery of Cliffs End, predominantly within LCA B1: Wantsum North Slopes with a small proportion of development extending into the far eastern fringes of LCA E1: Stour Marshes. The location of these developments around the periphery of an existing settlement limits the potential for more than a negligible magnitude of landscape change to be generated across the LCAs and the character and key characteristics would remain unchanged. The assessment of landscape effects for each receptor within the Zol of Cumulative Development Group 5 (as set out in **Chapter 11: Landscape and Visual Impact Assessment**) would therefore remain unchanged during both the construction and operational periods.

Cumulative Development Group 6

- 18.5.86 This Cumulative Development Group comprises two mixed use developments to the north and south of Westwood Cross within a landscape defined as 'urban' in the *Thanet Landscape Character Assessment*. The introduction of the developments into the existing urban fringe landscape which is already influenced by the existing industrial estate and large-scale built form of the retail units at Westwood Cross would lead to an incremental extension of this existing urbanising influence into the adjoining LCA C2: Central Thanet Undulating Chalk Farmland and LCA A1: Manston Chalk Plateau with further dilution of the open agricultural landscape occurring as a result of the Proposed Development. The low sensitivity of these landscapes means that the assessment of landscape effects for each receptor would remain unchanged during both the construction and operational periods and significant cumulative landscape effects would not arise.

Cumulative Development Group 7

- 18.5.87 Cumulative Development Group 7 includes three power or communications related developments located within two LCAs; E1: Stour Marshes as defined by the *Thanet Landscape Character Assessment* and LCA D2: Ash Level as defined by the *Dover District Landscape Character Assessment*²⁴. Common characteristics of both of these LCAs are the vast, open horizontal nature of the landscape with huge skies and extensive views, all of which are characteristics more capable of being able to accommodate large-scale vertical structures such as the three proposed within this development group and given the existing baseline in which pylons, tall masts and a wind turbine are already present, significant landscape effects are unlikely. The addition of the distant presence of the Proposed Development into this scenario is unlikely to generate significant cumulative landscape effects during construction and operational periods.

Cumulative Development Group 8

- 18.5.88 This relatively small industrial development proposed within an existing small-scale development of a similar type is located within LCA A1: Manston Chalk Plateau. The nature of the development (i.e. a change of land use and existing buildings along with the erection of four small-scale industrial buildings within a landscaped bund) limits the potential for this development to affect the character or key characteristics of this LCA or any other LCAs which fall within the Zol for this Cumulative Development Group. As such, the assessment of landscape effects set out in **Chapter 11: Landscape and Visual Impact Assessment** for each receptor would remain unchanged during both the construction and operational periods

All developments combined

- 18.5.89 When considering all of the developments combined, the pattern of effects described for the individual Cumulative Development Groups above remains valid. The conclusions of the landscape assessment set out in **Chapter 11: Landscape and Visual Impact Assessment** would not change and the predicted magnitudes of change and concluding levels of significance would not alter.

Visual effects

Cumulative Development Group 1

- 18.5.90 This relatively small residential infill development on the north-eastern edge of Minster has extremely limited potential to give rise to visual effects in relation to any of the visual receptor groups within the ZTV of the Proposed Development due to its scale and location on the northern slope of the former Wantsum Channel. It would not be visible from the nearest residential receptor group (residential receptor group 34) due to its slope location, whilst it could give rise to no more than a negligible magnitude of visual change if visible from the next closest visual receptors (residential receptor groups 12 and 46) from which it would appear as a minor extension to the existing settlement. It is unlikely that the development would be readily discernible from the small sections of the Viking Coastal Trail that fall within the ZTV of the Proposed Development as it traverses the base of the northern slope of the former Wantsum Channel within the Zol of this development. The assessment of visual effects for each receptor within the Zol of Cumulative Development Group 1 as set out in **Chapter 11: Landscape and Visual Impact Assessment** would therefore remain unchanged during both the construction and operational periods.

Cumulative Development Group 2

- 18.5.91 This Cumulative Development Group consists of seven proposed industrial/commercial developments at Manston Business Park and a relatively small residential infill development to the immediate north of residential receptor group 37 on Manston Road.
- 18.5.92 The industrial and commercial development would represent an incremental expansion of the existing industrial and commercial uses already present on the business park and would not substantially alter the views currently available to any of the visual receptors within the ZTV of the Proposed Development. The closest of these receptors would be the residents at residential receptor group 21 for whom this development may give rise to no more than a negligible magnitude of change in westerly views due to the presence of intervening vegetation. The industrial or commercial development would also be visible to westbound motorists on the B2190, for whom it may give rise to a low magnitude of visual change as an incremental extension to the business park to their north.
- 18.5.93 The residential infill development off Manston Road may give rise to a high magnitude of visual change for residents located in the northern-most part of residential receptor group 37, but these receptors fall outside the ZTV of the Proposed Development due to intervening vegetation and built form. For those residents of this group who fall within the ZTV, it is unlikely that the infill development would give rise to more than a negligible magnitude of visual change, again due to the presence of intervening vegetation and built form.
- 18.5.94 The assessment of visual effects for each receptor within the Zol of Cumulative Development Group 2 as set out in **Chapter 11: Landscape and Visual Impact Assessment** would therefore remain unchanged during both the construction and operational periods.

Cumulative Development Group 3

- 18.5.95 This relatively small residential infill development on the north-eastern edge of Manston has the potential to give rise to a high magnitude of visual change for those residential visual receptors to its immediate east (residential receptor groups 31 and 32) and south-west (residential receptor group 42). It also has the potential to give rise to a high magnitude of visual change for users of PRoW TR22 to its immediate north. Medium or low magnitudes of visual change may be experienced by other visual receptors surrounding this development including residential receptor groups 33, 38, 39, 40 and 41; users of PRoWs TR8 and TR9 and visitors to Manston Court Caravan Site (recreational receptor group 6). Each of these receptors has been assessed as likely to sustain significant visual effects in relation to the Proposed Development (as set out in **Chapter 11: Landscape and Visual Impact Assessment**) and the incremental effect of this development would not alter those assessments.

- 18.5.96 The assessment of visual effects for each receptor within the Zol of Cumulative Development Group 3 set out in 1 **Chapter 11: Landscape and Visual Impact Assessment** would therefore remain unchanged during both the construction and operational periods.

Cumulative Development Group 4

- 18.5.97 The six residential developments included in this group, if all taken forward, would comprise over a thousand dwellings and represent a substantial urban extension on the western edge of Ramsgate. As such, this group would have the potential to result in significant visual effects for many visual receptors located in close proximity to it. In relation to receptors that are predicted to experience visual effects in relation to the Proposed Development, this Cumulative Development Group would introduce the potential for cumulative effects to be experienced by residential receptor groups 2, 13, 26, 31, 32, 33 and 43. Each of these receptor groups would be likely to experience significant visual effects in relation to either the Proposed Development alone (residential receptor groups 31, 32, 33 and 43) or the developments included in this group alone (residential receptor groups 2, 13, 26, 31, 32, 33 and 43). The same situation would also apply to the recreational visual receptors in close proximity to this group. As a result, no receptor groups would experience significant visual effects in relation to this cumulative scenario that would not otherwise experience significant effects in relation to non-cumulative scenarios i.e. the incremental effect of the introduction of the Proposed Development into this scenario would not be significant during both the construction and operational periods. It is not considered that the minor commercial development near Little Cliffsend Farm would have the potential to affect any visual receptor affected by the Proposed Development.

Cumulative Development Group 5

- 18.5.98 The four developments included in Group 5, if all taken forward, would introduce over 150 dwellings and a retail unit clustered around the periphery of Cliffs End to the southeast of the Proposed Development. This group would have the potential to result in significant visual effects for the residential and recreational receptors (users of local PRowS) located in close proximity to each of the developments. For three of the four developments (ID 15, ID 31 and ID 32) the closest visual receptors and therefore those most likely to sustain significant visual effects are located outside of the ZTV for the Proposed Development and as such, no cumulative visual effects would occur for the construction and operational periods. For residential groups in the northern part of Cliffs End, residential receptor groups 43 and 48 are predicted to sustain significant visual effects as a result of the Proposed Development alone whilst group 44 and potentially users of a short section of PRow TR32 are likely to experience significant visual effects as a result of ID 33. As a result, no receptor groups would experience significant visual effects in relation to the cumulative scenario that would not otherwise experience significant effects in relation to non-cumulative scenarios i.e. the incremental effect of the introduction of the Proposed Development into this scenario would not be significant during both the construction and operational periods.

Cumulative Development Group 6

- 18.5.99 This Cumulative Development Group comprises two mixed use developments to the north and south of Westwood Cross to the northeast of the Proposed Development. Visual receptor groups most likely to sustain cumulative visual effects are those located between this development group and the Proposed Development including residential receptor groups 15, 18, 19, 23, 24 and 25 as well as users of the local PRow network which cross the agricultural landscape between the residential groups. For residential receptor groups 23 and 25 and users of PRowS in the southern half of PRow Group C, significant visual effects are predicted as a result of the Proposed Development alone whilst those in residential receptor group 15 are likely to experience significant visual effects as a result high magnitudes of visual change arising from ID 14 alone. As a result, none of these receptor groups would experience significant visual effects in relation to this cumulative scenario that would not otherwise experience significant effects in relation to non-cumulative scenarios during both the construction and operational periods.

- 18.5.100 For the remaining residential receptor groups (18, 19 and 24) and users of the remaining PRowS, low or negligible magnitudes of change are predicted in relation to the Proposed Development. With regard to residential receptor group 19, low to medium magnitudes of visual change are likely to be experienced by residents as a result of both ID 14 to the north and ID 150 to the east of this receptor group. As a result, this receptor group along with users of the PRow network in this area (TR24 and those close to Flete and Lydden within PRow Group C) may experience **significant** cumulative visual effects as a result of this development scenario during both the construction and operational periods.
- 18.5.101 For residential receptor group 24, north-easterly views towards ID 14 are likely to be heavily screened by perimeter vegetation for all but the two most northern properties in this group for which at least a Low magnitude of visual change is likely as a result of ID 14. However, their orientation (east – west) means that views towards the Proposed Development would be highly oblique and cumulative visual effects as a result of this development scenario would be not significant. Similarly, for residential receptor group 18, low or medium magnitudes of visual change are likely as a result of ID 14 although the orientation of the majority of the dwellings in this receptor group (those along Manston Court Road) again limits the potential for significant cumulative visual effects to arise through the introduction of the Proposed Development into this scenario. Therefore no significant visual effects would occur during both the construction and operational periods.

Cumulative Development Group 7

- 18.5.102 Cumulative Development Group 7 comprises three power or communications related developments within the southern half of the study area. Due to their scale, the Zol for each of these developments would be considerably greater than the other development groups considered in this CLIVA.
- 18.5.103 Visual receptors most likely to be affected by these developments are predominantly recreational and include users of the Saxon Shore Way, England Coast Path, southern most extent of the Thanet Coastal Path as well as users of National Cycle Route 1 and those at the Stonelees Golf Centre. Users of local PRow which cross the low lying marshes and residential receptor group 29 are also amongst those whose views are most likely to be affected by this group of developments. High to Medium magnitudes of visual change are likely to be experienced from the closest sections of these routes to the developments and from the network of local PRowS leading to significant visual effects as a result of one or more of these developments alone. The incremental effect of the introduction of the Proposed Development into this scenario would not be significant during both the construction and operational periods.

Cumulative Development Group 8

- 18.5.104 This relatively small industrial development proposed to the immediate west of the Proposed Development would represent an incremental expansion of the existing industrial uses already present within the site with a limited number of additional buildings proposed and an extension to perimeter screening bunds. Visual receptor groups most likely to sustain cumulative visual effects are residential receptor group 47 and users of PRowS within the southern part of PRow Group C. Both of these receptor groups would experience significant visual effects in relation to the Proposed Development alone. As a result, neither of these receptor groups would experience significant visual effects in relation to this cumulative scenario that would not otherwise experience significant effects in relation to the non-cumulative scenario during both the construction and operational periods. Visual effects experienced by other nearby receptor groups (residential receptor groups 8 and 23) would be limited by separation distance and the presence of vegetative screening or the existing northern bund around ID 176 and cumulative visual effects would be not significant during both the construction and operational periods.

All developments combined

- 18.5.105 When considering all of the developments combined, the pattern of effects described for the individual Cumulative Development Groups above remains valid. Only those visual receptor groups identified as potentially sustaining significant cumulative visual effects as a result of the

Proposed Development and the developments in Cumulative Group 6 (i.e. residential receptor group 19 and users of PRow close to Flete and Lydden within PRow Group C) would experience **significant** cumulative visual effects during the construction and operational periods with low to medium magnitudes of change predicted if all developments were taken forward. For the remaining visual receptors considered in the assessment, the introduction of the cumulative developments would not alter the conclusions of the LVIA in **Chapter 11: Landscape and Visual Impact Assessment** and the magnitudes of change and levels of significance for these receptors remains the same.

Assessment of Cumulative Effects: Noise

Construction phase

- 18.5.106 Based on a review of the type, size and proximity of other proposed developments within the study area:
- ▶ Cumulative effects resulting from construction noise from the Proposed Development in combination with construction noise from other developments are considered unlikely on existing sensitive receptors. This is because the majority of developments are located hundreds of metres from the Proposed Development and the developments are much smaller in size than the Proposed Development and will not require such extensive construction works in terms of activities and duration;
 - ▶ Cumulative effects on existing receptors resulting from increases in traffic noise from construction (and operation traffic) associated with the Proposed Development in combination with increases in construction and operation road traffic associated with other proposed developments are considered unlikely. This is because it was demonstrated in **Section 12.7 of Chapter 12: Noise and Vibration** that the increase in construction and operation road traffic noise associated with the Proposed Development will be negligible.
- 18.5.107 In summary, **no significant effects** have been identified during the construction phase.

Operational Phase

- 18.5.108 Based on a review of the type, size and proximity of other proposed developments within the study area:
- ▶ Cumulative effects on existing receptors resulting from increases in noise from the Proposed Development in combination with increases in noise resulting from other developments are considered unlikely. This is because no proposed developments have been identified which are considered to generate high levels of noise or vibration.
 - ▶ A number of proposed sensitive developments have been identified in close proximity to the airport which may not have considered noise or vibration from the Proposed Development hence they could be significantly affected by noise from the airport once operational. These are set out below.

Aircraft Noise - Permanent Noise Impacts on Residential Receptors

- 18.5.109 In Year 2, no developments are predicted to be significantly affected by noise on an individual basis in the context of Government Noise policy because they do not lie within the daytime SOAEL contour of 63 dB $L_{Aeq,16hr}$ (**Figure 12.4**) or the night time SOAEL contour of 55 dB $L_{Aeq,8hr}$ (**Figure 12.6**) with the Proposed Development.
- 18.5.110 In Year 20, the following residential development sites are forecast to be exposed to daytime noise above the daytime SOAEL of 63 dB $L_{Aeq,16hr}$ with the Proposed Development (**Figure 12.5**):
- ▶ ID 143: Manston Green residential (up to 785 dwellings), infrastructure, community and commercial; and

- ▶ ID 33: 40 Canterbury Road West residential (up to 62 dwellings).

- 18.5.111 A **significant adverse effect** in the context of Government Noise Policy has therefore been identified at ID 143 and ID 33 during the daytime. The effect would take the form of annoyance and disturbance as a result of aircraft noise.
- 18.5.112 In Year 20, the same developments also lie within the night time SOAEL contour of 55 dB $L_{Aeq,8hr}$ with the Proposed Development (**Figure 12.7**). A **significant adverse effect** in the context of Government Noise Policy has therefore been identified at ID 143 and ID 33 during the night time. The effect would take the form of annoyance, disturbance and sleep disturbance as a result of aircraft noise.
- 18.5.113 Dwellings exposed to aircraft noise above SOAEL will be eligible for sound insulation under the sound insulation grant scheme described in **Section 12.7**. These mitigation measures, if accepted by the property owner, will reduce noise inside all dwellings during the daytime and night time such that it does not reach a level where it will significantly affect residents.
- 18.5.114 In the case of ID 143 Manston Green, the development was consented under the provisions of the 2006 TDC Local Plan and as such it is the case that the consenting process assumed the existence and operation of Manston Airport. In the case of ID 33 Canterbury Road West, consent at the time of writing had not yet been granted however it should be assumed that any grant of consent would be in the context the 2006 TDC Local Plan which assumes the existence of Manston Airport.

Aircraft Noise - Permanent Noise Impacts on Community Receptors

- 18.5.115 The following sensitive residential developments are located within communities where significant effects were identified on a community basis in Year 2 and Year 20 in **Chapter 12: Noise and Vibration**:
- ▶ ID 3: Southall Close residential (12 dwelling);
 - ▶ ID 5: Manston Green residential (19 dwellings), live-work and shop/café;
 - ▶ ID 13: Flambeau Europlast Ltd residential (120 dwellings);
 - ▶ ID 15: Clifsend Farm Cottages residential (31 dwellings) and retail;
 - ▶ ID 24: Chilton Lane residential (14 dwellings);
 - ▶ ID 29: Manston Road/The Beacon residential (48 dwellings);
 - ▶ ID 31: Cottington Road residential (41 dwellings);
 - ▶ ID 32: Oakland Court residential (23 dwellings);
 - ▶ ID 33: 40 Canterbury Road West residential (62 dwellings);
 - ▶ ID 40: Canterbury Road residential (62 dwellings);
 - ▶ ID 143: Manston Green residential (785 dwellings), infrastructure, community and commercial;
 - ▶ ID 153: Manston Court residential (22 dwellings);
 - ▶ ID F: Land at Manston Tothill Street, Minster - Rural Site; and
 - ▶ ID G: Land south side of Foxborough Lane - Rural Site.
- 18.5.116 The effect in these communities would be characterised as a perceived change in quality of life for occupants of buildings in these communities or a perceived change in the acoustic character of shared open spaces within these communities during the daytime or night time. These community effects are not additional to those identified in **Chapter 12: Noise and Vibration**, therefore there are no new significant effects, however it is noted that the number of properties within the

communities potentially affected is greater when the shortlisted developments are taken into consideration.

Assessment of Cumulative Effects: Socio-economics

- 18.5.117 The cumulative assessment considered the potential cumulative effects which result from the combined effects of the Proposed Development and other shortlisted developments, as identified in **Table 18.4.**

Construction phase

All Developments Combined

- 18.5.118 The cumulative assessment considered the potential cumulative effects which result from the combined effects of the Proposed Development and other shortlisted developments, as identified in **Table 18.4.**
- 18.5.119 Collectively, the Proposed Development and other committed developments will likely affect local, perhaps even regional economies. These effects are anticipated to arise from direct, indirect and catalytic employment opportunities during construction. In this instance, it is not anticipated that the construction phase of the Proposed Development will interact with the operational phases of other shortlisted developments to produce a cumulative effect, since these phases will cover different employment markets.
- 18.5.120 It is likely that the construction programmes of other committed developments will overlap with that of the Proposed Development, given the long-term nature of the development and proportion of other committed developments anticipated to come forward between 2019-2021. Therefore, this will lead to a cumulative benefit to employment. There will be a net increase in the demand for construction workers, creating new opportunities in addition to the potential for apprenticeships and training for entrants into the labour market. Effects will also be apparent in the supply chain, particularly for businesses catering for construction workers. These indirect effects will arise from the increased spending of non-local construction workers; spending is likely to be associated with subsistence and accommodation. It is anticipated that the impact will be moderate and the effect will be of moderate beneficial significance.
- 18.5.121 The development of a strong local supply chain would assist in increasing the long-term economic benefits associated with the Proposed Development in combination with other committed development within the local area. If achieved, this could increase the magnitude of any beneficial economic effects. It is anticipated that the impact will be low and the effect will be of minor beneficial significance.
- 18.5.122 Within the surrounding urban areas (extending from Sandwich to the south toward Margate and Ramsgate in the east), there is an abundance of accommodation, with approximately 102 hotels and B&Bs. The prominence of these services is likely related to the sea-side locations of Margate and Ramsgate and existing tourism industry. As such, it is considered that the potential increases in the local and regional workforce can be met within the existing provision, with no subsequent effects upon existing businesses and future visitors to the area. Therefore, it is considered that the wider demand for accommodation from other committed developments will lead to an effect of **negligible significance** upon the availability of accommodation within the local and wider area.

Operation phase

All Developments Combined

- 18.5.123 A number of the shortlisted developments will create additional employment opportunities across numerous sectors, inclusive of hospitality, healthcare, transport and industrial occupations. Shortlisted developments associated with this are as follows:
- ▶ ID 127: Little Cliffsend Farm industrial (2 units);

- ▶ ID 138: Thanet Parkway Railway Station;
- ▶ ID 143: Manston Green residential (785 dwellings), infrastructure, community and commercial;
- ▶ ID 150: Eurokent residential (550 dwellings), business units, commercial, community and infrastructure;
- ▶ ID 173: Manston Business Park business and industrial (46 units);
- ▶ ID 192: Invicta Way batching plant and commercial (10 units); and
- ▶ ID 193: Columbus Avenue industrial (3 units) and office.

- 18.5.124 Together with the operational phase of the Proposed Development, these developments will promote the continuation of a diverse economic base to support the population. It is anticipated that the effect will be of **minor beneficial significance**.
- 18.5.125 It is not anticipated that the operational phase of the Proposed Development will interact with the construction phases of other shortlisted developments to produce a cumulative effect, since these phases will cover different employment markets.

Assessment of Cumulative Effects: Traffic and Transport

- 18.5.126 The traffic and transport assessments undertaken for the Proposed Development involves the use of a future local growth forecast which is applied to the baseline traffic counts. The methodology adopted is detailed in **Chapter 14: Traffic and Transport**. This methodology has been applied across Years 1-20 of the construction programme and as such is applicable to both the construction and operational phases.
- 18.5.127 The traffic and transport assessments have not considered the specific shortlisted developments as these are subsumed into the growth rates used, and thus growth from these developments has been assessed based on a more robust wider growth rate. As such the assessment of the cumulative effects is inherent to the environmental assessment within **Chapter 14: Traffic and Transport** and the chapter should be reviewed for further details.

Assessment of Cumulative Effects: Health and Wellbeing

- 18.5.128 The shortlisted developments, when considered in combination with the Proposed Development, have the potential to result in additional environmental and social effects. Additionally the shortlisted developments introduce new sensitive receptors that could be affected by environmental and social effects as a result of the Proposed Development. Such effects are considered within each of the pertinent topic headings within **Chapter 15: Health and Wellbeing** (namely, air quality, noise, visual, socio-economics etc), with a corresponding appraisal as to the significance of effect.
- 18.5.129 The only significant inter-project cumulative effect that relates to human health is noise effects on proposed and future receptors. As this effect has been incorporated into the assessment within **Chapter 15: Health and Wellbeing**, it is not considered to be an additional human health effect, and is thus not reported again in this Chapter,

Assessment of Cumulative Effects: Climate Change

- 18.5.130 The climate change topic includes assessments of both the effects of in-combination climate change impacts (i.e. the impact of the Proposed Development and climate change on environmental receptors) and the effects of greenhouse gas (GHG) emissions from the Proposed Development (i.e. the impact of the Proposed Development on climate change). Due to the short timescales involved, there are no climate change effects associated with the construction phase of the Proposed Development.

Operational phase

All developments combined

In-combination climate change impacts

- 18.5.131 Any combined impact on environmental receptors from the Proposed Development and the developments listed may be affected by climate change. If climate change is considered within the design of any combining developments and the mitigations put in place are of a similar level to those for the Proposed Development, as would be expected, then the cumulative impact is **Not Significant**.

GHG emissions

- 18.5.132 None of the identified developments have GHG emissions that would be captured within the UK aviation forecast, and thus do not influence the impact of aviation operations in the region on meeting the UK's carbon targets. The combined GHG emissions effect is therefore **Not Significant**.

Assessment of Cumulative Effects: Major Accidents and Disasters**Construction Phase**

- 18.5.133 Based on a review of the type, size and proximity of shortlisted proposed developments within the study area, which are residential and business properties, industrial units, roads, parking and fencing, cumulative effects associated with the Proposed Development construction activities and their interaction with other developments are considered unlikely. No shortlisted development has been identified with the potential to impact the Proposed Development and lead to major accidents. Additionally, none of the other shortlisted proposed developments in close proximity to the Proposed Development are known to be potential major hazard sites.
- 18.5.134 From the information available on the developments, no developments have been identified which modify the findings and conclusions of the assessment with regard to the source, pathways, receptors, or the ability of the aerodrome to respond in the event of an emergency. This is because in close proximity to the Proposed Development the other shortlisted proposed developments present only a small additional increase in population compared to the baseline, and none are closer to where damaging effects of major accidents associated with construction activities are anticipated.
- 18.5.135 The nearest relevant proposed development is ID 33: 40 Canterbury Road West residential (62 dwellings), but this is not close to the existing fuel tanks and is unlikely to be affected by major accident effects during construction.
- 18.5.136 On this basis **no significant** cumulative effects have been identified.

Operational Phase

- 18.5.1 The other shortlisted developments are residential and business properties, industrial units, roads, parking and fencing. The increase in population numbers in close proximity to the Proposed Development is low compared to the current baseline. None of the other proposed developments are located closer to the runway or fuel farm tanks than existing and similar types of development. The nearest relevant proposed development is ID 33: 40 Canterbury Road West residential (62 dwellings).
- 18.5.2 ID 133: Thanet Extension Offshore Wind Farm. The onshore works involve an export cable to be installed connecting the wind farm to the coast at Pegwell Bay. This cable is in proximity of the existing Manston Airport drainage outfall pipeline, which will be retained for the Proposed Development. With standard construction best practice it is very unlikely that cable installation could accidentally damage the drainage pipeline. In any case, any damage would still result in discharges from the airport site entering Pegwell Bay, albeit this may be from a slightly different location. On that basis, it is considered that significant cumulative impacts are unlikely to arise and have been assessed to be **not significant**.

- 18.5.3 Based on a review of the type, size and proximity of shortlisted proposed developments within the study area, cumulative effects during the operational phase of the Proposed Development and their interaction with other developments are considered unlikely. No shortlisted development has been identified with the potential to impact the Proposed Development and lead to major accidents. Additionally none of the other shortlisted proposed developments in close proximity to the Proposed Development are known to be potential major hazard sites.
- 18.5.1 On this basis **no significant** cumulative effects have been identified.

18.6 Conclusion

- 18.6.1 The assessment of cumulative effects has been carried out in accordance with the provisions of existing policy guidance. This has looked at inter-related effects on receptors of the individual environmental effects of the Proposed Development itself, as well as potential cumulative effects with other developments in the area.

Inter-related effects

- 18.6.2 Residential properties in close proximity to the airport runway (at Alland Grange Lane; the southern end of High Street, Manston; Pounces Cottages; the northern end of Cliffs End and on Canterbury Road West, south of Jentex site), have the potential to experience significant inter-related noise and visual effects during the daytime. However if the noise insulation scheme is taken up, inter-related effects are less likely. In this instance, potentially significant inter-related effects would likely be experienced by residents within gardens at the northern end of Cliffs End only. However, up to eight properties at the northern end of Cliffs End will also experience significant indoor inter-related effects but will be eligible for financial assistance for moving away from the Proposed Development as part of the dwelling relocation scheme.
- 18.6.3 Significant inter-related effects are also anticipated at the Spitfire and Hurricane Memorial Museum and RAF Manston History Museum in relation to visitor arrival and departure and any outdoor exhibits during the daytime.
- 18.6.4 The community of Manston may also experience significant inter-related noise and visual effects during the daytime, in both shared open spaces and indoor spaces (particularly in the area of Preston Road, Manston; in northern section of High Street, Manston; in southern section of High Street; Manston; Jubilee Cottages on Manston Road; PRowS TR8, TR9, TR10 and TR22; and Manston Court Caravan Site and Preston Parks). Effects on some indoor spaces are less likely to be significant if eligible residents take up the noise insulation scheme, however this scheme will not apply to caravan sites.
- 18.6.5 Table 18.7 summaries the significant inter-related effects.

Table 18.7 Summary of significant inter-related effects

Receptor	Comments
Residential properties at Alland Grange Lane; the southern end of High Street, Manston; Pounces Cottages; the northern end of Cliffs End and on Canterbury Road West, south of Jentex site	<p>Significant daytime inter-related noise and visual effects during the operational phase of the Proposed Development.</p> <p>If the noise insulation scheme is taken up, inter-related effects are less likely. In this instance, potentially significant inter-related effects would likely be experienced by residents within gardens at the northern end of Cliffs End only.</p> <p>However up to eight properties at the northern end of Cliffs End also will experience significant indoor inter-related effects but will be eligible for financial assistance for moving away from the Proposed Development as part of the dwelling relocation scheme.</p>
Visitors to the Spitfire and Hurricane Memorial Museum and RAF Manston History Museum	Significant daytime inter-related noise and visual effects are anticipated in relation visitor arrival and departure and any outdoor exhibits during the operational phase of the Proposed Development.

The community of Manston, particularly in the area of Preston Road, Manston; in northern section of High Street, Manston; in southern section of High Street, Manston; Jubilee Cottages on Manston Road; PRoWs TR8, TR9, TR10 and TR22; Manston Court Caravan Site and Preston Parks

Significant daytime inter-related noise and visual effects are anticipated during the operational phase of the Proposed Development, in both shared open spaces and indoor spaces. Effects on some indoor spaces are less likely to be significant if eligible residents take up the noise insulation scheme, however this scheme will not apply to caravan sites.

Cumulative effects

18.6.6

Table 18.8 provides a summary of likely significant inter-project cumulative effects as concluded in **Section 18.3**. No additional significant inter-project cumulative effects are likely with regards to air quality, biodiversity, freshwater environment, historic environment, land quality, landscape, noise (construction period only), socio-economics, traffic and transport, health and wellbeing, climate change and major accidents and disasters.

Table 18.8 Summary of significant inter-project cumulative effects

Development ID	Receptor	Effect	Comments
Visual			
ID 14 and ID 150	Residential receptor group 19 (Properties on Haine Road) and PRoW TR24 and PRoWs close to Flete and Lydden within PRoW Group C	Significant adverse	Significant cumulative visual effects could be experienced by these receptors as a result of the introduction of three substantial developments (the Proposed Development, ID 14 and ID 150) into middle distance views. The contribution of the Proposed Development to the magnitude of visual change experienced by these receptors would be low, but the combined magnitude of change would be likely to increase to medium. The incremental contribution of the Proposed Development would be limited to low in part due to the mitigation measures incorporated into the Proposed Development. It is possible that significant cumulative effects could be avoided were similar mitigation measures (in terms of the provision of landscape screening) to be incorporated into ID 14 and ID 150. Appropriate mitigation measures appear to be incorporated into ID 150, although the final adoption of these cannot be confirmed. This provision cannot be ascertained from the current level of detail provided in the planning application documents for ID 14.
Combined effects: ID3, ID 153, ID 156, ID 166, ID 173, ID 5, ID 13, ID 24, ID 29, ID 127, ID 143, ID 15, ID 31, ID 32, ID 33, ID 14, ID 150, ID 81, ID 133, ID 134	Residential receptor group 19 (Properties on Haine Road) and PRoW TR24 and PRoWs close to Flete and Lydden within PRoW Group C	Significant adverse	Combined effects would be the same as those described in relation to ID 14 and ID 150, above.
Operation Noise			
ID 33, ID 143	Residential properties at the Manston Green development site and at 40 Canterbury Road West, at the northwestern edge of Cliffsend.	Significant adverse	The effect would take the form of annoyance and disturbance as a result of aircraft noise during the day and annoyance, disturbance and sleep disturbance as a result of aircraft noise during the night. Significantly affected

dwellings will be eligible for sound insulation which, if accepted by the property owners, will reduce noise inside dwellings during the daytime and night time such that it does not reach a level where it will significantly affect residents.

REFERENCES

- 1 Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment
- 2 Planning Act 2008 S23(4)(a) -(b) and (5)(a)-(b) (2008) [online] Available at http://www.legislation.gov.uk/ukpga/2008/29/pdfs/ukpga_20080029_en.pdf [Accessed 29/01/2018]
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