

Cambridge Waste Water Treatment Plant Relocation Project
Anglian Water Services Limited

Environmental Statement

Chapter 5: EIA Methodology

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Summary

The purpose of the Environmental Impact Assessment (EIA) process is to identify the likely significant effects of the Proposed Development on the environment. This is done by identifying the baseline conditions; predicting the potential impacts of the Proposed Development and how these impacts may change the baseline conditions; and then applying mitigation to avoid, prevent or reduce any potential adverse impacts. An assessment of the resulting effects is carried out defined by the magnitude of the impact (degree of change) and the importance, sensitivity or value of the impacted receptor or resource.

This chapter provides a generic EIA process methodology. Some technical assessments within the ES will require deviation from this due to topic specific factors, the details of which are provided as necessary in each topic chapter.

The technical scope of the ES was initially established through the request for a formal Scoping Opinion from the Planning Inspectorate, based on a Scoping Report which set out the findings of the scoping process undertaken. Consultation with key stakeholders and the evolution of the project design has also influenced the technical scope.

The spatial scope of the EIA varies across the technical assessments and takes into account a range of factors which include the physical extent of what is proposed and the way impacts are likely to occur. For example, any potential effects on buried archaeology would tend to be limited to those areas physically disturbed by the works, whilst the effects of noise could be experienced further away and visual intrusion could occur from nearby to greater distances.

The temporal scope of the assessment generally refers to the time periods over which impacts may be experienced which may be permanent, temporary, long term or short term. This has been established for each topic chapter and is based upon the project programme which is set out in Chapter 2: Project Description (Application Document Reference 5.2.2).

Each topic chapter includes a description of the current (baseline) environmental conditions which form the basis of the assessment, enabling the likely significant effects to be identified through a comparison with the baseline conditions. In addition, consideration has been given to how the baseline conditions may change between the time of assessment and when the Proposed Development is being constructed/is operational (the future baseline). The future baseline has also taken into account the likely effects of climate change.

Each topic chapter includes a description of any features of the Proposed Development, or measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment. An iterative approach has been adopted for the Proposed Development, whereby a specific impact and the significance of the resulting effect is initially assessed and, if this is deemed to be a significant adverse effect in terms of the EIA Regulations, changes are made (where practicable) to relevant parameters or design of the Proposed Development in order to avoid, reduce or offset the impact.

Mitigation measures that are an intrinsic part of the project design are termed primary measures. Measures required regardless of any EIA assessment as a result of legislative requirements or standard sectoral practices are termed tertiary measures. Primary and tertiary measures are embedded within the design and considered as part of the main assessment of effects. Mitigation measures that require management activity in order to achieve the anticipated outcome are

generally specific to a receptor and are considered to be secondary (additional) mitigation applied before determining residual effects.

To inform the technical assessments, a range of parameters for each aspect of the Proposed Development has been defined (the design envelope), with a maximum design scenario identified for each potential effect that has been assessed. This approach is consistent with the Planning Inspectorate's Advice Note Nine: "Rochdale Envelope" and provides confidence that the EIA process robustly considers the realistic worst-case impact of the Proposed Development on each aspect of the environment, whilst also allowing the Proposed Development to be optimised and refined during detailed design, prior to construction of the proposed Wastewater Treatment Plant (WWTP).

The significance of an effect (which can be adverse or beneficial), is determined taking account of both a) the sensitivity or importance/value of a receptor and b) the magnitude of impact or change.

Receptors are defined as the physical or biological resource or user group that would be affected by a project. Some receptors will be more sensitive to certain environmental effects than others. The sensitivity or value of a receptor may depend, for example, on its nature, location, rarity, quality, extent or conservation status at an international, national, regional or local level.

Impacts are defined as the physical changes to the environment attributable to the project. The categorisation of the magnitude of an impact takes into account factors such as extent, duration, frequency and reversibility.

The significance of an effect can be neutral, slight, moderate or major. Effects that are considered moderate or greater are generally 'significant' in terms of the EIA Regulations (unless where otherwise set out in the individual technical assessments).

For effects that are initially assessed as being significant (with primary and tertiary mitigation applied) secondary mitigation is incorporated to further reduce likely significant effects. Residual effects are defined as the effects remaining once all secondary mitigation measures have been taken into consideration.

Limitations with the data collected to inform the baseline are provided in each technical assessment chapter. For example, the effects associated with the coronavirus pandemic when England was subject to a full lockdown for substantial periods may have an influence on primary data collection for some topics, e.g. traffic and air quality. Where uncertainty exists, a conservative (i.e. realistic worst case scenario) approach to defining the project and assessing the likely significant effects has been used. Professional judgement is used to determine what is conservative, noting that the purpose of EIA is to identify effects that are both significant and likely.

Inter-related or in combination effects are multiple effects on individual receptors or receptor groups via multiple environmental pathways, such as traffic, visual impact, air quality and noise. Cumulative effects result from the combination of impacts from multiple projects experienced at a receptor over a prolonged period. This includes the assessment of effects of the Proposed Development together with other proposed (but not yet completed) development projects that are not included in the baseline environmental data gathered. Cumulative effects are incorporated in underlying future projections for some environmental aspects, for example traffic growth forecasts and future background air quality.

The first stage of the cumulative effect assessment (CEA) is a search of the planning register to create a long-list of developments and then to screen this to a short-list, removing developments

where on review of the available information, no cumulative effects in any EIA topic area are considered likely. The short-list is refined on a topic by topic basis through identifying sensitive environmental receptors which could potentially experience a significant effect as a result of a cumulative development acting together with the Proposed Development. The output of this exercise is provided in Chapter 22: Cumulative Effects (App Doc Ref 5.2.22).

Transboundary effects arise when development within one European Economic Area (EEA) state affects the environment of another EEA state(s). A transboundary effects screening matrix was completed during scoping. No significant transboundary effects have been identified and therefore more detailed assessment of such effects has been scoped out of the assessment process.

In order to address potential major accidents and disasters associated with the Proposed Development, an exercise was completed at scoping stage to identify all possible major accidents or disasters that could be scoped out. A summary of major accident or disasters that were not able to be scoped out is provided in ES Chapter 2: Project Description, with cross-references to where these have been addressed in the ES.

1 Introduction

1.1 EIA requirements

1.1.1 EIA Regulation 5(2) requires that: *“The EIA must identify, describe and assess in an appropriate manner, in light of each individual case, the direct and indirect significant effects of the Proposed Development on the following factors—*

- (a) population and human health;*
- (b) biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC;*
- (c) land, soil, water, air and climate;*
- (d) material assets, cultural heritage and the landscape;*
- (e) the interaction between the factors referred to in sub-paragraphs (a) to (d).”*

1.1.2 Furthermore, the National Policy Statement (NPS) for Waste Water (HM Government, 2012) states that the following generic impacts cover the most significant issues and those which arise most frequently. This list of generic impacts, excluding coastal change, has informed the scope of the ES and is reproduced below:

- water quality and resources;
- odour;
- flood risk;
- biodiversity and geological conservation;
- landscape and visual impacts;
- land use including open space, green infrastructure and green belt;
- noise and vibration;
- historic environment;
- air quality and emissions;
- dust, artificial light, smoke, steam and insect infestation;
- traffic and transport impacts;
- waste management; and
- socio-economic.

1.1.3 The impact assessment methodology employed in this Environmental Statement (ES) draws upon the Planning Inspectorate’s Advice Notes (The Planning Inspectorate, n.d.) inter alia:

- Advice Note Seven: “Environmental Impact Assessment: Process, Preliminary Environmental Information and Environmental Statements”;
 - Advice Note Nine: “Rochdale Envelope”; and
 - Advice Note Seventeen: “Cumulative effects assessment relevant to nationally significant infrastructure projects”.
- 1.1.4 Each technical assessment also refers to relevant topic specific guidance documents as set out in Chapters 6 to 20.
- 1.1.5 In addition to scoping responses, responses from consultation with statutory bodies listed under Section 42 of the Planning Act have been taken into consideration and, where relevant, have been used to inform the final design of the Proposed Development and impact assessment. A summary of Section 42 consultation undertaken is provided in Chapters 6 to 20 and is set out more fully within the Consultation Report (App Doc Ref 6.1).

2 Relationship with Other Regimes

2.1 Introduction

- 2.1.1 Other consents and permits will be required for construction and operation of the Proposed Development, which have not been included within the DCO itself. These are identified in the Consents and Other Permits Register (App Doc Ref 7.1), in accordance with Section 5 of PINS Advice Note 11. There is also a variety of applicable legislation and regulatory standards, which either apply to the Proposed Development directly or affect environmental management. Examples include building regulations, environmental permitting, health and safety legislation or vehicle emission and air pollution standards.
- 2.1.2 Relationships with these other regimes are considered in three main ways in the EIA methodology.
- 2.1.3 Firstly, information and assessment in respect of certain specific regulatory and environmental assessment requirements which lie outside the EIA process but are closely linked to its topics, such as Habitats Regulations Assessment, have been provided in supporting application documents and are cross-referenced within the ES topic chapters. These are summarised under the subheadings below.
- 2.1.4 Secondly, mitigation measures, management plans and environmental monitoring set out in this ES have been developed with reference to the other consents or regulatory requirements that apply. Examples include Natural England's licensing process for protected species management.
- 2.1.5 Thirdly, ES topic chapters set out applicable legislative and regulatory requirements and the assessments have been undertaken on the basis that these requirements are complied with, including through further consent applications and the subsequent controls and monitoring provided through permitting regimes governing waste management or discharges to air, water and land. Regulatory compliance and the enforcement of applicable environmental standards required by law are treated as being in place and operated effectively. While some of these consents are not in place at the time the assessment is being undertaken the EIA process is undertaken in the knowledge that the development will proceed in accordance with legal obligations. By way of example, it is common knowledge that an Environmental Permit will be required before the proposed WWTP can become operational and it will then be operated in accordance with the Best Available Techniques that apply to the sector, including the applicable limits on emissions to atmosphere and water.

2.2 Water Framework Directive (WFD)

- 2.2.1 A WFD assessment (Appendix 20.3, App Doc Ref 5.4.20.3) has been carried out to identify any impacts on the water body status of the River Cam and other relevant WFD classified water bodies including Bottisham Lode, Quy Water, the Cam and Ely

Ouse Chalk groundwater body which sits below the proposed WWTP. Mitigation measures are determined based on the outcome of the assessment.

- 2.2.2 The assessment follows the three-stage screening/scoping and detailed assessment approach outlined in the Planning Inspectorate’s Advice Note Eighteen: “The Water Framework Directive”. WFD classification is used to determine the sensitivity of water resources in the EIA and the predicted impact on WFD status is used to define the magnitude of impact. The WFD assessment outcomes have been used in undertaking the EIA and have also contributed to determining the need for any mitigation measures.

2.3 Habitats Regulations Assessment (HRA)

- 2.3.1 HRA is required for plans and projects likely to have a significant effect on a European or internationally important site for nature conservation. An HRA assessment (Appendix 8.16, App Doc Ref 5.4.8.16) is included within the DCO application and referred to within ES Chapter 8: Biodiversity (App Doc Ref 5.2.8).
- 2.3.2 The HRA follows the three-stage approach outlined in the Planning Inspectorate’s Advice Note Ten: “Habitat Regulations Assessment relevant to Nationally Significant Infrastructure Projects”, which identifies likely significant effects, assesses any adverse effects on integrity of a European site, and considers the derogations (as appropriate).

2.4 Health Impact Assessment (HIA)

- 2.4.1 The South Cambridgeshire District Council Local Development Framework HIA Supplementary Planning Document (South Cambridgeshire District Council, 2011) states at paragraph 2.10 that *“For those development proposals that are already required to submit an Environmental Impact Assessment (EIA) it may make sense to integrate health impacts into the EIA rather than duplicate the assessments as the methodology is very similar and there is a large overlap in the evidence gathered and used in both assessments. The Council’s preferred approach is for Health Impact Assessments to be integrated with other similar assessments to ensure the HIA is wide ranging and has adequately examined all the potential health impacts of a development”*.
- 2.4.2 Based on this guidance, the scoping exercise and experience working with this Local Authority, the HIA has been integrated within the EIA.

2.5 Equality Impact Assessment (EqIA)

- 2.5.1 Equality effects are considered in a separate EqIA (App Doc Ref 7.12), which is included as a supporting document within the DCO application.
- 2.5.2 This is in line with paragraphs 4.15.6 to 4.15.9 of the National Policy Statement for Waste Water which states that: *“The Applicant should undertake and include in their*

application an equality impact assessment for the construction, operation and decommissioning phases”.

3 Key Principles of Assessment

3.1 Overview

- 3.1.1 The purpose of the EIA process is to identify the likely significant effects of the Proposed Development on people and the environment. This is done by identifying the baseline conditions, predicting the potential impacts of the Proposed Development and how these impacts may change the baseline conditions and then applying mitigation to avoid, prevent or reduce any potential adverse impacts. An assessment of the resulting effects is carried out defined by the magnitude of the impact (degree of change) and the importance, sensitivity or value of the impacted receptor or resource.
- 3.1.2 The following components have been set out for each ES topic in each ES chapter:
- summary of relevant planning policy and legislation;
 - summary of consultation activity outputs, including comments received in the Scoping Opinion, during non-statutory engagement with Technical Working Groups, and from statutory s42 consultation and s47 local community consultation;
 - description of the approach to assessment, including reference to any specific guidance followed and details of the methodologies used;
 - identification of the study area;
 - description of the baseline environmental conditions;
 - presentation of the impact assessment undertaken, which includes:
 - identification of the maximum design envelope for each impact assessment;
 - a description of the measures adopted as part of the design of the Proposed Development, including mitigation/design measures and design standards set through tertiary/regulatory controls to prevent, reduce or offset environmental effects;
 - an assessment of the likely impacts and effects associated with the Proposed Development;
 - identification of any secondary mitigation measures required in respect of likely significant effects (in addition to those measures that are considered primary i.e. design measures, or tertiary i.e. required through legislation or standard good practice); and
 - identification of any future monitoring required.
- 3.1.3 An assessment of any cumulative effects with other major developments is provided in Chapter 22: Cumulative Effects.

3.2 Technical scope of the EIA

- 3.2.1 The first step to establishing the technical scope was through the request for a formal Scoping Opinion. This was made to PINS on 19 October 2021, based on a Scoping Report which set out the findings of the scoping process undertaken. The Scoping Opinion was received from PINS on 29 November 2021. Subsequent consultation with statutory and non-statutory consultees has further influenced the technical scope and has been taken into account in undertaking the EIA. A summary of the relevant issues raised via the scoping response and consultation with statutory bodies is included in each technical assessment chapter.
- 3.2.2 Baseline information as it became available through site surveys, the evolution of the project description or inclusion of commitments which were incorporated to implement mitigation throughout the pre-application period have also influenced the technical scope of the ES.

3.3 Spatial scope of the EIA

- 3.3.1 In general terms, the spatial or geographical scope of each technical assessment takes into account the following factors:
- the physical extent of the proposed works, as defined by the Scheme Order Limits;
 - the nature of the baseline environment and the way the impacts are likely to be propagated (e.g. through defining source-pathway-receptor approaches); and
 - the pattern of governmental administrative boundaries, which provide the planning and policy context for the project.
- 3.3.2 Appropriate study areas for each topic chapter have been defined by the specialists undertaking the assessment. The topic specific study areas have been discussed and agreed with the relevant stakeholders and each technical chapter includes a commentary on how the study area has been defined.

3.4 Temporal scope of the EIA

- 3.4.1 The temporal scope of the assessment generally refers to the time periods over which impacts may be experienced i.e. permanent, temporary, long term or short term. This has been established for each topic chapter, and where appropriate through discussion with the relevant statutory consultees. Terms used to qualify the duration of an impact or effects are specific to the topic being considered and the standards and criteria used against which topic specific effects are assessed.
- 3.4.2 The anticipated project construction programme is set out in Chapter 2: Project Description to inform the definition of likely periods for construction phase activities.

3.5 Methodology and assessment criteria

- 3.5.1 Each topic chapter provides details of the methodology for baseline data collection and the approach to the assessment of effects. Each environmental topic has been considered by a specialist in that area.
- 3.5.2 Each topic chapter defines the scope of the assessment within the methodology section, together with details of the study area, desk study and survey work undertaken and the approach to the assessment of effects. The identification and evaluation of effects have been based on the information set out in ES Chapter 2: Project Description, environmental assessment good practice guidance documents and relevant topic-specific guidance where available.

3.6 Description of the environmental baseline conditions (including future baseline)

- 3.6.1 The existing and likely future environmental conditions in the absence of the Proposed Development are known as ‘baseline conditions’. Each topic chapter includes a description of the current (baseline) environmental conditions. The baseline conditions within the study area form the basis of the assessment, enabling the likely significant effects to be identified through a comparison with the baseline conditions.
- 3.6.2 The future baseline for the assessment represent the conditions that would exist in the absence of the Proposed Development at the time that the development is likely to be implemented. The earliest construction is expected to start is 2024 and the construction programme would be approximately three years in duration, followed by commissioning, as set out in ES Chapter 2: Project Description.
- 3.6.3 Consideration has been given to any likely changes between the time of survey and the future baseline for the construction and operation of the Proposed Development. In some cases, these changes may include the construction or operation of other planned or consented developments in the area. Where such developments are built and operational at the time of writing and data collection, these have been considered to form part of the baseline environment. Otherwise planned future developments are considered within the assessment of additional cumulative effects.
- 3.6.4 The consideration of future baseline conditions has also taken into account the likely effects of climate change.

3.7 Measures envisaged to prevent, reduce and where possible offset significant adverse effects

- 3.7.1 Regulation 14(2) of the EIA Regulations requires an ES to include a “*description of any features of the Proposed Development, or measures envisaged in order to avoid,*

prevent or reduce and, if possible, offset likely significant adverse effects on the environment”.

- 3.7.2 The design of the proposed WWTP ensures compliance with emission limits set under regulatory requirements such as the Environmental Permits, for example, emission limits to air and water. The proposed WWTP is designed to comply with these regulatory requirements which are embedded within the design rather than being relied upon to achieve mitigation.
- 3.7.3 An iterative approach has been adopted for the Proposed Development, whereby a specific impact and the significance of the resulting effect is initially assessed and, if this is deemed to be a significant adverse effect in terms of the EIA Regulations, changes are made (where practicable) to relevant parameters or design of the Proposed Development in order to avoid, reduce or offset the impact. The assessment is then repeated and the process continues until the EIA practitioner is satisfied that:
- the effect has been reduced to a level that is not significant in terms of the EIA Regulations; or
 - having regard to other constraints, no further changes may be made to design parameters in order to reduce the magnitude of impact (and hence significance of effect). In such cases, an overall effect that is still significant in terms of the EIA Regulations is presented in the ES.
- 3.7.4 The iterative approach to the assessment process has been used as a means of informing the design of the Proposed Development (through the identification of likely significant effects and development of mitigation measures to address these).
- 3.7.5 By employing this approach, the significance of effect presented in the ES is the maximum predicted residual effect that the Proposed Development will have, should it be approved and successfully implemented.
- 3.7.6 Details of mitigation measures, and how these are secured, are provided in each chapter and Appendix 2.6: Mitigation Tracker (App Doc Ref 7.10).

3.8 Identification of impacts and the assessment of significance of effects

Scope of impact assessment

- 3.8.1 Taking into account the nature, size and location of the Proposed Development (see parameters defined in Chapter 2: Project Description), the information provided in the Scoping Report (Appendix 4.2, App Doc Ref 5.4.4.2), Scoping Opinion (Appendix 4.1, App Doc Ref 5.4.4.1) and other consultation responses provided throughout the EIA process, the following topics have been identified as requiring consideration within this ES:

- Agricultural land and soils (Chapter 6);
- Air quality (Chapter 7);
- Biodiversity (Chapter 8);
- Climate Resilience (Chapter 9);
- Carbon (Chapter 10);
- Community (Chapter 11);
- Health (Chapter 12);
- Historic environment (Chapter 13);
- Land quality (Chapter 14);
- Landscape and Visual Amenity (Chapter 15);
- Material Resources and Waste (Chapter 16);
- Noise and vibration (Chapter 17);
- Odour (Chapter 18);
- Traffic and Transport (Chapter 19); and
- Water resources (Chapter 20).

3.8.2 While no environmental topic areas have been scoped out of the ES in their entirety, each topic chapter details any specific effects within that topic area that have been scoped out on the basis that no likely significant environmental effects are expected.

Maximum design scenario (Rochdale Envelope)

3.8.3 To inform the technical assessments, a range of parameters for each aspect of the Proposed Development has been defined (the design envelope), with a maximum design scenario identified for each potential effect that has been assessed.

3.8.4 The design envelope is such that it encompasses the potential variations in design and other aspects of the Proposed Development; the maximum design scenario is intended to allow the assessment to be based on a likely worst-case approach, specific to the effect being assessed.

3.8.5 The maximum design scenario approach employed for the Proposed Development is consistent with the Planning Inspectorate's Advice Note Nine: "Rochdale Envelope".

3.8.6 The design envelope for the overall Proposed Development provides the maximum extent of the consent sought. The detailed design of the Proposed Development will then be developed, refined and procured within this consented envelope prior to construction. For each environmental aspect, the technical specialist has derived the worst-case scenario used in each impact assessment and set out the assumptions and limitations in Section 2.6 of each Chapter. Section 2.5 within each of the

technical chapters contain maximum design scenarios for each of the potential effects assessed.

Sensitivity or importance of receptors

3.8.7 Receptors are defined as the physical or biological resource or user group that would be affected by a project. For each topic, baseline studies have informed the identification of potential environmental receptors. Some receptors will be more sensitive to certain environmental effects than others. The sensitivity or value of a receptor may depend, for example, on its nature, location, rarity, quality, extent or conservation status at an international, national, regional or local level.

3.8.8 Sensitivity is defined within each topic chapter of this ES and takes into account factors including the:

- vulnerability of the receptor;
- recoverability of the receptor; and
- value/importance of the receptor.

3.8.9 Sensitivity is generally described using the following scale:

- very high;
- high;
- medium; and
- low.

Magnitude of impact

3.8.10 Impacts are defined as the physical changes to the environment attributable to the project. For each topic the likely environmental impacts/change arising from the Proposed Development has been identified and compared with the baseline (the future situation without the Proposed Development).

3.8.11 The impacts identified account for the primary and tertiary mitigation measures relevant to each topic.

3.8.12 The categorisation of the magnitude of impact is topic-specific but generally takes into account factors such as:

- extent;
- duration;
- frequency; and
- reversibility.

3.8.13 The magnitude of an impact has generally been defined used the following scale:

- major;
- moderate;
- minor; or
- negligible.

3.8.14 In some cases, a further category of ‘neutral’ or ‘no change’ has been used.

Significance of effects

3.8.15 Effect is the term used to express the consequence of an impact (expressed as the ‘significance of effect’), which can be adverse or beneficial. This is identified by considering the magnitude of the impact and the sensitivity or value of the receptor.

3.8.16 The magnitude of an impact does not directly translate into significance of effect. For example, a significant effect may arise as a result of a relatively modest impact on a resource of national value, or a large impact on a resource of local value. The significance of the effect depends on both the impact magnitude and the sensitivity or importance of the receptor.

3.8.17 In order to ensure a transparent and consistent approach throughout the assessment, a matrix approach has been adopted as a guide. There is, however, latitude for professional judgement where deemed appropriate in the application of the matrix. Where the matrix offers a choice of significance levels, professional judgement has been used to determine the most likely outcome. An example of the matrix used to inform the topic-specific methodologies in each topic is set out in Table 3-1.

Table 3-1: Matrix used for the assessment of significance of effect

		Sensitivity/Value of Receptor			
Magnitude of impacts		Low	Medium	High	Very High
Negligible	Neutral	Neutral	Neutral	Slight	Slight
	Not significant	Not significant	Not significant	Not significant	Not significant
	Minor	Neutral	Slight	Slight	Moderate
	Not significant	Not significant	Not significant	Not significant or Moderate Significant	Significant
Moderate	Slight	Moderate Significant	Moderate Significant	Major Significant	
Major	Not significant	Not significant	Not significant	Not significant	Not significant
	Slight	Moderate Significant	Moderate Significant	Major Significant	Major Significant
	Not significant	Not significant	Not significant	Not significant	Not significant

3.8.18 An effect of moderate or greater significance is generally considered 'significant' in terms of the EIA Regulations.

3.8.19 In cases where a range is suggested for the significance of effect, there remains the possibility that this may span the significance threshold (i.e. the range is given as minor to moderate). In such cases the final significance is based upon the expert's professional judgement as to which outcome delineates the most likely effect, with an explanation as to why this is the case.

Secondary mitigation and future monitoring

3.8.20 For effects that are initially assessed as being significant (with primary or tertiary mitigation applied) secondary mitigation is further incorporated to reduce likely significant effects to environmentally acceptable levels (i.e. not significant), where possible. Secondary mitigation is generally receptor specific and may make reference to management plans to control activities or specific commitments which were not either built in to the Proposed Development design or required through legislation or standard good practice.

3.8.21 To verify predictions and or to address areas of uncertainty, future monitoring may be proposed to support adaptive environmental management for the construction, operation and maintenance of the Proposed Development.

Residual effects

3.8.22 Residual effects are defined as the effects remaining once all secondary mitigation measures have been taken into consideration. Following the identification of secondary mitigation measures as described above, the assessment re-evaluates the significance of effect.

3.8.23 Where mitigation is delivered through management plans or specific performance commitments, this is secured as appropriate through DCO requirements and/or through the process of other consents and licence applications.

4 Limitations and Uncertainties

- 4.1.1 Limitations with the data collected to inform the baseline are provided in each technical assessment chapter, setting out clearly where either the data itself, or any subsequent subjective evaluation may introduce error. An explanation on how data limitations were managed or commentary on confidence levels is included. Key data limitations with the baseline data and their ability to materially influence the outcome of the EIA are noted and commented on.
- 4.1.2 Where uncertainty affects the assessment of effects, a conservative (i.e. realistic worst case) approach to assessing the likely significant effects has been used, and where appropriate, secondary mitigation measures developed accordingly.

5 Cumulative Effects Assessment (CEA)

5.1 Introduction

5.1.1 Cumulative effects result from multiple impacts on receptors occurring in combination over time. This includes the assessment of effects of the Proposed Development together with other proposed (but not yet completed) development projects that are not included in the baseline environmental data gathered.

5.1.2 The Planning Inspectorate's Advice Note Seventeen: "Cumulative effects assessment" relevant to nationally significant infrastructure projects, provides a clear and systematic approach to CEA, in particular to identifying sites for consideration in the assessment. This guidance identifies the following types of development projects to be taken into account:

- projects under construction;
- consented applications not yet implemented;
- submitted applications not yet determined;
- local authority planning applications where a scoping report has been submitted;
- projects on Planning Inspectorate's Programme of Projects;
- sites identified in the relevant Local Development Plans (and emerging Local Development Plans – with appropriate weight being given as they move closer to adoption); and
- other plans and programmes (as appropriate) which set the framework for future development consent/approval, where such development is reasonably likely to come forward.

5.1.3 The guidance acknowledges that the availability of information on different development types will depend upon the status of the development and that consequently greater weight should be applied in the CEA to those development types with the greatest level of data certainty.

5.2 Approach to the assessment of cumulative effects

5.2.1 The first stage of the CEA is a search to create a long-list of developments (see ES Chapter 22: Cumulative Effects) with the possibility of cumulative effects and then to screen this to a short-list, removing developments where on review of the available information, no cumulative effects in any EIA topic area are considered likely.

5.2.2 The approach to identifying the long-list and short-list of cumulative projects has followed that in the Planning Inspectorate's Advice Note Seventeen: "Cumulative effects assessment" relevant to nationally significant infrastructure projects, with the following key steps:

- establishing a potential zone of influence (ZoI) of the Proposed Development;
 - undertaking a desk study of planning applications, development plan documents, relevant development frameworks and other available sources to identify a long-list of development projects that fall within the Chapter 22: Cumulative Effects (App Doc Ref 5.4.22); and
 - screening and shortlisting those developments with potential for cumulative effects based upon temporal scope, the scale and nature of the project, the location of the project and other relevant factors.
- 5.2.3 In accordance with PINS Advice Note Seventeen: “Cumulative effects assessment relevant to nationally significant infrastructure projects” (The Planning Inspectorate, n.d.), the search area for the long list of developments was set at 2 km from the Scheme Order Limits, consistent with the largest ZoI of any of the individual disciplines.
- 5.2.4 The initial list of cumulative projects was identified in the Scoping Request and comments were provided by the Planning Authorities on this request. This has subsequently been refined and agreed through meetings and email correspondence (May 2022) with planning officers to identify a long-list of cumulative projects for EIA purposes.
- 5.2.5 The short-list is refined on a topic by topic basis through identifying sensitive environmental receptors which could potentially experience a significant effect as a result of a cumulative development acting together with the Proposed Development.
- 5.2.6 The prediction and evaluation of the significance of cumulative effects has been undertaken on a topic by topic basis using the shortlist of relevant projects (where sufficient information is available) and affected receptors identified for each EIA topic.
- 5.2.7 Where there has been uncertainty about the potential for significant cumulative effects in the scoping process these effects have been assessed on a precautionary basis.
- 5.2.8 The overall approach to evaluation of impact significance generally follows that adopted for the Proposed Development in isolation, where the significance of effects on receptors takes account of the magnitude of the predicted impacts and the sensitivity of the receiving environment. Significance is evaluated taking into account the mitigation measures which have already been committed as part of the EIA process for the Proposed Development, i.e. based on its reported residual effects.
- 5.2.9 In some cases, where limited environmental information about other proposed developments is available, specific magnitudes of impacts and degrees of significant effect (such as moderate or major) may not be possible to predict. In such cases, the assessment still seeks to discuss where there is the potential for cumulative effects to occur and to provide details of whether cumulative effects are likely to be significant. A statement is made as to whether the cumulative effects have the

potential to be more significant than the effects of the Proposed Development alone and, if so, whether this change would be adverse or beneficial.

- 5.2.10 Where significant cumulative effects are predicted, further mitigation has been considered where possible to avoid, reduce or offset such effects, and residual effects have been predicted, as set out in ES Chapter 22.

5.3 Inter-related effects

Introduction

- 5.3.1 It is good practice to consider the inter-relationships between topics that may lead to environmental effects. For example, the separate impacts of noise and habitat loss may have an effect upon a single ecological receptor.
- 5.3.2 The approach presented in this ES has been developed with specific regard to the Planning Inspectorate's Advice Note Nine: "Rochdale Envelope", which states that:

"Where the Applicant chooses to follow a parameters-led assessment to establish the worst case scenario for the ES, they should ensure that the applicable parameters are explained and clearly set out in order to;

ensure that interactions (interactions between aspect assessments includes where a number of separate impacts, e.g. noise and air quality, affect a single receptor such as fauna) between aspect (the Planning Inspectorate refers to 'aspects' as meaning the relevant descriptions of the environment identified in accordance with the EIA Regulations) assessments are taken into account relevant to the worst case scenario(s) established and that careful consideration is given to how these are assessed; and

ensure that the assessment of the worst case scenario(s) addresses impacts which may not be significant on their own but could become significant when they inter-relate with other impacts alone or cumulatively with impacts from other development (including those identified in other aspect assessments)."

Approach to the assessment of inter-related effects

- 5.3.3 Inter-related effects are effects that interact spatially and/or temporally resulting in multiple effects upon a single receptor. For example, the effect upon habitat loss or disturbance may be greater when multiple sources of impact interact or combine to produce a different or greater effect upon this receptor than when single sources of impact are considered in isolation. Receptor-led effects might be short term, temporary or transient effects, or incorporate longer term effects.
- 5.3.4 The assessment of inter-related effects is provided in Chapter 22: Cumulative Effects, whereby a description is included outlining the potential for individual effects to combine, incorporating qualitative and, where appropriate, quantitative assessments, to potentially create additional effects that may be of greater significance than the individual effects acting in isolation.

5.4 Transboundary effects

- 5.4.1 Transboundary effects arise when development within one European Economic Area (EEA) state affects the environment of another EEA state(s).
- 5.4.2 A transboundary effects screening matrix was completed during scoping. No significant transboundary effects have been identified and therefore more detailed assessment of such effects has been scoped out of the assessment process.

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