

A428 Black Cat to Caxton Gibbet improvements

TR010044

Volume 6

6.1 Environmental Statement

Chapter 4: Environmental Assessment Methodology

Planning Act 2008

Regulation 5(2)(a)

Infrastructure Planning (Applications: Prescribed Forms and
Procedure) Regulations 2009

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Infrastructure Planning

Planning Act 2008

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(Applications: Prescribed Forms and
Procedure) Regulations 2009**

**A428 Black Cat to Caxton Gibbet
improvements
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Chapter 4: Environmental Assessment Methodology

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4 Environment assessment methodology

4.1 Environmental scoping

Scoping of the assessments

- 4.1.2 A scoping exercise was undertaken in March 2019, the purpose of which was to determine the extent of issues to be considered in the Environmental Impact Assessment (EIA) and reported in the Environmental Statement.
- 4.1.3 The scoping exercise was based on the Scheme design presented within Highways England's preferred route announcement for the Scheme (Ref 4-1) (see **Chapter 3, Assessment of alternatives** of the Environmental Statement [TR010044/APP/6.1]) and took into account the maximum extents of land that were considered by Highways England at that time as being required for its construction, operation and maintenance.
- 4.1.4 The following documents were used to guide and inform the scoping exercise.
National Policy Statement for National Networks
- 4.1.5 As the Scheme comprises a road network nationally significant infrastructure project (NSIP), the methodologies within Section 5 of *the National Policy Statement for National Networks* (NPSNN) (Ref 4-2) were referenced to ensure the scope of the EIA met the assessment requirements of this policy document.
- 4.1.6 The extent to which the EIA complies with the methodological and assessment requirements of Section 5 of the NPSNN (Ref 4-2) is described within the Case for the Scheme [TR010044/APP/7.1].
Infrastructure Planning (Environmental Impact Assessment) Regulations 2017
- 4.1.7 The environmental and social factors stipulated in Regulation 5(2) of the *Infrastructure Planning (Environmental Impact Assessment) Regulations 2017* (Ref 4-3) (the EIA Regulations) as requiring consideration when undertaking an EIA of an NSIP were taken into account during the scoping exercise.
Design Manual for Roads and Bridges
- 4.1.8 Guidance contained within the (now withdrawn) *Design Manual for Roads and Bridges Volume 11: Environmental Assessment* (Ref 4-4) (DMRB) was referenced during the scoping exercise, as this identified a range of environmental topic areas for consideration in the assessment of highways projects and provided advice on the level of assessment detail appropriate to each.
- 4.1.9 Supplementary guidance contained within the (now withdrawn) *Interim Advice Note 125/15: Environmental Assessment Update* (Ref 4-5) was also referenced during the scoping exercise, which provided further advice on ensuring that EIAs of road projects are both effective and efficient.

Issues for consideration in the EIA

- 4.1.10 Following a review of relevant policy and guidance (Ref 4-2; Ref 4-3; Ref 4-4; Ref 4-5), the scoping exercise identified that the following environmental topics should be considered in the EIA on the basis that construction (including demolition works), operation and maintenance of the Scheme could potentially lead to significant effects on the environment.
- a. Air Quality – covering the factors¹ of population, human health and air.
 - b. Cultural Heritage – covering the factor of cultural heritage.
 - c. Biodiversity – covering the factor of biodiversity.
 - d. Landscape – covering the factors of landscape and population.
 - e. Noise and Vibration – covering the factors of population and human health.
 - f. Population and Human Health – covering the factors of human health, population, land, soil, and material assets.
 - g. Road Drainage and the Water Environment – covering the factors of flood risk, human health and water.
 - h. Geology and Soils – covering the factor of soil.
 - i. Material Assets and Waste – covering the factors of waste and material assets.
 - j. Climate – covering the factor of climate.
 - k. Assessment of Cumulative Effects – covering the potential interactions between the above factors (and those associated with other plans and projects).
- 4.1.11 The scoping exercise concluded that heat and radiation were not matters relevant to the scope of the Scheme, and that these emissions did not require consideration in the Environmental Statement.
- 4.1.12 Following a preliminary assessment, the scoping exercise concluded no significant potential for transboundary effects to occur within the above topics, these being effects that could arise on other European Economic Area (EEA) States as a result of the Scheme. This was attributed to factors such as the characteristics of the Scheme, the geographical area to which effects would be confined, and the intervening distance to the nearest EEA State.
- 4.1.13 A preliminary assessment was also undertaken as part of the scoping exercise to identify whether the Scheme would be vulnerable to risks associated with major accidents and disasters, and whether these could result in any change to the likely effects associated with other topics. A staged methodology was developed and applied using professional judgement to:
- a. Identify any major accidents and disasters of relevance and categorise these in relation to the likelihood of occurrence and relationship to the Scheme.

¹ EIA undertaken in accordance with the EIA Regulations (Ref 4-3) must report against the factors set out in Regulations 5(2)(a) to 5(2)(e).

- b. Describe the potential for any change in the significance of effects recorded within each relevant assessment topic for identified major accidents and disasters.
 - c. Report the outcomes and conclusions within each assessment topic, where relevant.
 - d. Describe any assumed mitigation measures to both support the conclusions and demonstrate that effects related to major accidents and disasters have been mitigated or can be managed to an acceptable level.
- 4.1.14 The preliminary assessment of major accidents and disasters concluded that the vulnerability of the Scheme to such events would be low, and that the Scheme would not be a contributing factor to causing or exacerbating these types of event.
- 4.1.15 The scoping exercise examined whether the decommissioning of the Scheme could result in significant effects within the above topic areas. This concluded that it would be highly unlikely that the Scheme would be decommissioned as the new and improved infrastructure would form an integral part of the local and strategic transportation network, with components having a lifespan of many years (see **Chapter 2, The Scheme** of the Environmental Statement [TR010044/APP/6.1]).
- 4.1.16 The outcomes of the scoping exercise, including the findings of the preliminary assessments of transboundary effects and major accidents and disasters, were reported in a scoping report (Ref 4-6).

Scoping opinion

- 4.1.17 Highways England made a request to the Inspectorate (on behalf of the Secretary of State) on 2 April 2019 to obtain its written opinion on the scope and level of detail of the information to be provided in the Environmental Statement, under Regulation 10(1) of the EIA Regulations (Ref 4-3).
- 4.1.18 The request was accompanied by the scoping report (Ref 4-6), which provided the information required by Regulation 10(3) of the EIA Regulations (Ref 4-3), and also provided formal notification under Regulation 8(1)(b) of the EIA Regulations (Ref 4-3), of Highways England's intention to submit an Environmental Statement as part of the Development Consent Order (DCO) application.
- 4.1.19 The Inspectorate provided its scoping opinion [TR010044/APP/6.5] on 13 May 2019 on behalf of the Secretary of State, which took account of the content of the scoping report (Ref 4-6) and the responses received from the consultation bodies engaged.
- 4.1.20 The scoping opinion [TR010044/APP/6.5] confirmed agreement with the majority of the proposed scope but highlighted a number of additional matters requiring consideration.

4.1.21 A request was made in the scoping opinion [TR010044/APP/6.5] for further evidence to be provided to fully justify the scoping out of matters identified as being unlikely to give rise to significant environmental effects, and also where additional information and detail relating to the Scheme needed to be provided, in the Environmental Statement.

Modifications to the EIA scope

Scoping opinion outcomes

- 4.1.22 Matters raised within the scoping opinion [TR010044/APP/6.5] were reviewed against the content of the scoping report (Ref 4-6) to identify where changes to the approach and/or further survey and assessment were necessary.
- 4.1.23 As part of this review, advice was sought from the Inspectorate on 26 May 2019² to clarify several matters raised in the scoping opinion [TR010044/APP/6.5].
- 4.1.24 The scope of the EIA was accordingly modified by Highways England to take account of the requirements of the scoping opinion [TR010044/APP/6.5] and the Inspectorate's clarifications, in order to fulfil its obligations under Regulation 14(3)(a) of the EIA Regulations (Ref 4-3) in relation to the Environmental Statement having to be based on the most recent scoping opinion adopted.
- 4.1.25 Where relevant, consideration was given to the responses contained in Appendix 2 of the scoping opinion [TR010044/APP/6.5] which were submitted by the consultation bodies.
- 4.1.26 The preliminary assessments incorporated into the scoping report (Ref 4-6) for the topics of transboundary effects and major accidents and disasters were updated to reflect the final form of the Scheme and to take account of the outcomes of the EIA process. These updated assessments are presented within Appendix 4.1 [TR010044/APP/6.3] and Appendix 4.2 [TR010044/APP/6.3] respectively, the outcomes of which confirmed that the original conclusions of these exercises remain valid. Accordingly, transboundary effects and effects relating to major accidents and disasters are not considered further in the Environmental Statement.
- 4.1.27 Justification has been provided as to the reasons why certain matters remain, or have now subsequently, been scoped out of consideration in the Environmental Statement, for example where sufficient evidence has been gathered which confirms with a degree of certainty that there is no likelihood of significant environmental effects occurring.
- 4.1.28 Similarly, where the Inspectorate stated in the scoping opinion [TR010044/APP/6.5] that it disagreed with the proposed scoping out of particular matters, these were incorporated into the overall scope of the EIA and assessed to an appropriate level of detail.

² Advice published at: <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010044/TR010044-Advice-00003-1-A428%20Black%20Cat%20to%20Caxton%20Gibbet%20Improvement%20scheme%20-%20Project%20Meetings%2026%20May%202019%20and%204%20June%202019.pdf>.

4.1.29 Full details of how the EIA scope was modified in response to the scoping opinion [TR010044/APP/6.5] are presented in **Table 1 of Appendix 4.3 [TR010044/APP/6.3]**.

Engagement outcomes

4.1.30 Following receipt of the scoping opinion (Ref 4-7), engagement continued with statutory and non-statutory bodies through a combination of written correspondence, meetings and workshops, the purpose of which was to obtain further views and opinions on aspects including the scope of work being undertaken, the methodologies being followed, the prediction and assessment of impacts and effects, the development of mitigation measures, and any requirements for monitoring significant environmental effects.

4.1.31 Where undertaken, the outcomes of this engagement are summarised in **Chapters 5 – 15** of the Environmental Statement [TR010044/APP/6.1].

4.1.32 Full details of the engagement undertaken during the EIA process are presented within the Consultation Report [TR010044/APP/5.1].

Design-development outcomes

4.1.33 Continued development of the Scheme design has influenced the scope of individual assessments progressed following publication of the scoping opinion [TR010044/APP/6.5].

4.1.34 Refinements have been made to the engineering and environmental design of the Scheme in response to:

- a. The outcomes of statutory consultation.
- b. The outcomes of non-statutory supplementary consultations.
- c. Views expressed by statutory and non-statutory bodies, landowners and utility companies.
- d. Traffic modelling.
- e. The earthworks strategy developed by the appointed buildability contractor.
- f. The EIA process.

4.1.35 During the design-development process, it was identified that a high pressure gas pipeline operated by Cadent Gas Limited would need to be diverted as part of the Scheme (the Diversion). Due to the scale and location of the Diversion, an EIA screening exercise was undertaken against the EIA Regulations (Ref 4-3).

4.1.36 Details of the EIA screening exercise are reported in **Appendix 4.4** of the Environmental Statement [TR010044/APP/6.3], the outcomes of which concluded that the works would give rise to likely significant effects, and would therefore satisfy the criteria for the Diversion to be considered an NSIP under s20 of the *Planning Act 2008* (Ref 4-8) and be treated as an NSIP in its own right.

- 4.1.37 A review was accordingly undertaken of the following National Policy Statements to determine whether any matters relating to the general assessment principles and methodologies would require the scope of the EIA to be modified:
- Overarching National Policy Statement for Energy (EN-1)* (Ref 4-8/Ref 4-8).
 - National Policy Statement for Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4)* (Ref 4-9).
- 4.1.38 The review identified that the relevant requirements of EN-1 (Ref 4-8) and EN-4 (Ref 4-9) relating to the EIA of pipeline works are not materially different to those set out in the NPSNN (Ref 4-2). The review concluded that the scope of the EIA in relation to the topics being assessed, and the methodologies being applied, adequately covered the requirements of EN-1 (Ref 4-8) and EN-4 (Ref 4-9) and that no modifications were necessary.
- 4.1.39 **Chapter 3, Assessment of alternatives** of the Environmental Statement [TR010044/APP/6.1] describes how the design of the Scheme has developed since undertaking the scoping exercise, and how the above considerations have influenced its final form.
- 4.1.40 **Appendix B** of the Case for the Scheme [TR010044/APP/7.1] highlights the key themes across the NPSNN (Ref 4-2), EN-1 (Ref 4-8) and EN-4 (Ref 4-9) and confirms accordance with the key requirements relating to EIA.
- New guidance outcomes*
- 4.1.41 Subsequent to the publication of the scoping opinion [TR010044/APP/6.5], Highways England published a series of new DMRB standards relating to sustainability and the environment (Ref 4-10) from July 2019. These new standards replaced the guidance and advice contained within *DMRB Volume 11: Environmental Assessment* (Ref 4-4) and *Interim Advice Note 125/15: Environmental Assessment Update* (Ref 4-5), which were withdrawn from use.
- 4.1.42 Key objectives of the new DMRB standards (Ref 4-10) are to set out a clear and specific requirements-based approach to environmental assessment and achieve closer alignment with the requirements of *Directive 2011/92/EU* (Ref 4-11), as amended by *Directive 2014/52/EU* (Ref 4-12).
- 4.1.43 As these new DMRB standards (Ref 4-10) were published part way into undertaking the EIA and replaced the guidance upon which many of the approaches presented in the scoping report (Ref 4-6) were based, a review was undertaken by Highways England to determine the feasibility of their adoption and whether this would require modifications to be made to the scope of, and approach to undertaking, the EIA and/or the way in which this was being reported in the Environmental Statement.
- 4.1.44 In summary the review identified that the new DMRB standards (Ref 4-10):
- Ratified and simplified the withdrawn assessment guidance (Ref 4-4; Ref 4-5).
 - Provided improved alignment with EIA guidance published more widely.
 - Provided topic-specific assessment criteria where none previously existed.

d. Removed components within certain topics that previously required assessment under the withdrawn DMRB Volume 11 guidance (Ref 4-4).

- 4.1.45 Highways England contacted the Inspectorate on 17 December 2019 to inform them of the publication of the new DMRB standards (Ref 4-10). A request for advice was also made on their implementation within the EIA, and whether their adoption would materially alter the basis of the EIA or compromise the ability to undertake and report the assessments in accordance with the advice contained within the scoping opinion [TR010044/APP/5.1].
- 4.1.46 The Inspectorate confirmed that the assessments to be reported within the Environmental Statement could be based on the new DMRB standards (Ref 4-10), but that justification for their adoption would need to be provided in relation to any alteration of approach³.
- 4.1.47 The justification for adoption of the new DMRB standards (Ref 4-10) is presented in **Chapters 5 – 14** of the Environmental Statement [TR010044/APP/6.1], which set out how the new DMRB standards (Ref 4-10) have been applied in each topic assessment. **Table 2 of Appendix 4.3** of the Environmental Statement [TR010044/APP/6.3] sets out the changes to the scope and methodology of each topic assessment arising from the new DMRB standards (Ref 4-10) and explains the reasons for their adoption over the withdrawn guidance (Ref 4-4; Ref 4-5).

4.2 Surveys, predictive techniques and methods

Rochdale Envelope parameters and design uncertainty

- 4.2.2 **Chapters 2 and 3** of the Environmental Statement [TR010044/APP/6.1] explain how consultation undertaken prior to submission of the DCO application has informed the design-development of the Scheme.
- 4.2.3 **Chapter 2, The Scheme** of the Environmental Statement [TR010044/APP/6.1] recognises that parts of the Scheme's design, as consented, may be subject to further refinement and optimisation prior to, and during, its construction.
- 4.2.4 This has been addressed by adopting a precautionary approach to identifying significant environmental effects, involving the establishment of a series of maximum development extents known as a 'Rochdale Envelope'.
- 4.2.5 The Rochdale Envelope is named after a UK planning law case (Ref 4-13). It is an established principle that allows a development project to be broadly defined within a series of parameters. Its adoption allows meaningful EIA to be undertaken by defining a reasonable worst case scenario that decision-makers can consider when determining the acceptability of the environmental effects of a development project.

³ Advice published at: <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010044/TR010044-Advice-00002-1-A428%20Black%20Cat%20to%20Caxton%20Gibbet%20Improvement%20scheme%20-%20Meeting%20Update%202017%20December%202019.pdf>

- 4.2.6 The principle is founded on the assumption that if the technical and engineering parameters of a development project fall within the limits of the envelope, and the EIA has considered the likely significant effects of that envelope, then flexibility within those parameters is deemed to be permissible within the terms of any consent granted.
- 4.2.7 The reasonable worst case scenario assumes that one parameter will likely have a more significant adverse effect than its alternative. Where a range of parameters are provided, the most environmentally detrimental parameter is assessed in the EIA. The most environmentally detrimental parameter can differ between environmental topics, depending on the environmental resource or receptor being assessed.
- 4.2.8 Advice published by the Inspectorate (Ref 4-14) fully endorses the approach of assessing design uncertainty, whilst still meeting the requirements of the EIA Regulations (Ref 4-3).
- 4.2.9 In line with this approach, parameters have been established across aspects of the Scheme to manage uncertainty, accommodate design flexibility, and ensure worst-case scenarios are assessed. These parameters are presented in **Chapter 2, The Scheme** of the Environmental Statement [TR010044/APP/6.1] and include matters relating to:
- The identification of maximum horizontal and vertical limits of deviation, within which the design of the Scheme can be adjusted if necessary.
 - The definition the maximum extents of land required to mitigate the Scheme's environmental effects.
- 4.2.10 This approach to managing uncertainty within defined parameters and limits ensures that any design changes that may arise post submission of the DCO application will not be of an order that renders the content of the Environmental Statement inadequate or invalid.

EIA guidance

- 4.2.11 In undertaking the EIA, the key principles, topics, approaches and criteria set out in the latest DMRB standards (Ref 4-10) have been applied. Where appropriate, these have been supplemented using guidance contained in the following policy documents, advice notes and best practice guidelines.
- NPSNN (Ref 4-2) – this sets out the need and government policies for road network NSIPs in England.
 - EN-1 (Ref 4-8) and EN-4 (Ref 4-9) – these set out the government's policies for the delivery of major energy infrastructure.
 - National Planning Policy Framework* (Ref 4-15) – this provides policy guidance on the treatment of environmental impacts and the achievement of good design.
 - The Inspectorate's Advice Notes (Ref 4-14; Ref 4-16; Ref 4-17; Ref 4-18; Ref 4-19) – these provide guidance on EIA technical and procedural matters specific to NSIPs.

- e. *Guidelines for Environmental Impact Assessment* (Ref 4-20) published by the Institute of Environmental Management and Assessment (IEMA) – this provides best practice guidance for undertaking EIA.
- f. *Environmental Impact Assessment: Guide to Shaping Quality Development* (Ref 4-21) published by IEMA – this sets out principles and framework for maximising the interaction between environmental thinking and project design.

4.2.12 A number of the assessments reported in the Environmental Statement have applied other topic-specific guidance published by public authorities and/or professional bodies, the details of which are presented in **Chapters 5 – 14** of the Environmental Statement [TR010044/APP/6.1] where referenced.

Existing and future baseline conditions

- 4.2.13 The EIA commenced with the identification of the existing baseline conditions that may be affected by the Scheme through a review of information relating to known, or the likely presence of, environmental resources and receptors within defined study areas to determine their relative value, importance or sensitivity towards change.
- 4.2.14 Resources comprise environmental aspects which support and are essential to natural or human systems. These include areas or elements of population, ecosystems, watercourses, air and climatic factors, landscape, and material assets.
- 4.2.15 Receptors comprise people, for example occupiers of dwellings, users of recreational areas and community facilities, and elements within the environment, for example flora and fauna, that rely on environmental resources.
- 4.2.16 Environmental data, information and records were obtained using a combination of the following sources and techniques.
- a. Desk-based sources – these included: previous published studies undertaken as part of the Scheme; published literature; databases, records and schedules relating to environmental designations; national and local planning policy documents; historic and current mapping; aerial photography; and data gathered from previous environmental assessments.
 - b. Site-based surveys – these have been undertaken to verify and consolidate information gathered during the desk-based review, and to evaluate the relationships between specific environmental interests and their wider environmental value.
 - c. Consultation and engagement – statutory and non-statutory bodies were approached to obtain factual information and records.
- 4.2.17 The existing baseline conditions accordingly reflect the environmental conditions which prevail at the time of undertaking surveys and reporting the EIA. Although most baseline information relied upon in the EIA was acquired during the years of 2019 and 2020, data and information gathered in 2017 and 2018 to inform the identification, development and selection of Scheme options was also used where appropriate and still relevant.

- 4.2.18 The EIA has also involved identifying and predicting how the current state of the environment will likely evolve over time in the absence of the Scheme. This is referred to as the future baseline and reflects the environmental conditions that are likely to exist immediately prior to construction works for the Scheme commencing (year 2022), and in the first year that the Scheme would be open for traffic (year 2026).
- 4.2.19 In establishing the likely future baseline conditions, a combination of predictive modelling and professional judgement was used to identify and take account of the following variables that could occur.
- Changes from natural events, trends and evolution (including human activities) – for example where ecological species move from their current location over time and populate different areas, or where environmental conditions are expected to alter as a consequence of future climate change.
 - Changes in environmental and societal values – for example where the status of the environment alters due to protection through planning designations being introduced or changed.
 - Changes to the problem being addressed by the Scheme – for example where existing traffic issues on the network are forecast to alter as a result of unrelated development projects being implemented by others.
 - Changes relating to future development – for example where construction of a new housing development is programmed to be completed around the time of Scheme construction commencing, and which may alter existing land use relationships.
- 4.2.20 In relation to future development projects, any developments completed by the end of October 2020 have been considered as part of the existing baseline conditions in **Chapters 5 – 14** of the Environmental Statement **[TR010044/APP/6.1]**.
- 4.2.21 Developments that have yet to be constructed, but which have a valid consent in place, have been included within the future baseline for the years 2022 and/or 2026 – these being the years adopted in the assessment for Scheme construction and opening. The extent to which these developments are likely to influence the future baseline conditions in these years are described within the individual topic assessments reported in **Chapters 5 – 14** of the Environmental Statement **[TR010044/APP/6.1]**.
- 4.2.22 Developments that have yet to be consented, but which are expected to come forward in the future, are considered as part of the cumulative effects assessment reported in **Chapter 15, Assessment of cumulative effects** of the Environmental Statement **[TR010044/APP/6.1]**.
- 4.2.23 The full list of baseline, future baseline and cumulative developments is presented in **Chapter 15, Assessment of cumulative effects** of the Environmental Statement **[TR010044/APP/6.1]**.

Spatial and temporal scope

- 4.2.24 The spatial extents of assessment study areas vary in accordance with the environmental topic area being considered.
- 4.2.25 The study area(s) for each environmental topic is outlined within each of the topic assessments reported in **Chapters 5 – 14** of the Environmental Statement [TR010044/APP/6.1]. These reflect the geographical area over which significant environmental effects may occur as a result of the Scheme.
- 4.2.26 All topic study areas incorporate the land and features within the Scheme's Order Limits as a minimum.
- 4.2.27 For some topics, study areas have been defined as being relatively localised to the boundary of the Scheme's Order Limits, whilst for others they extend outward beyond this boundary to capture the wider road network, distant communities, and sensitive areas within the surrounding environment.
- 4.2.28 It is accepted practice to assess the effects of a development project at defined points in its lifecycle to establish how environmental effects may alter over time. Accordingly, the approach has been to assess the Scheme at key stages of its construction, operation and future maintenance, against both the existing and future baseline conditions where appropriate, using a combination of available information, scientific knowledge and professional judgement.
- 4.2.29 The following assessment years and scenarios have been defined and adopted where relevant to the topic under consideration.
- a. Year 2019 to 2020 – reflective of the conditions which exist at the time of gathering baseline environmental data, undertaking the EIA and reporting its outcomes.
 - b. Year 2022 – reflective of the future conditions that would likely exist immediately prior to construction works for the Scheme commencing.
 - c. Year 2022 to 2026 – reflective of the future conditions that would be experienced during the period over which construction works for the Scheme are planned to take place.
 - d. Year 2026 – reflective of the future conditions that would be experienced when the Scheme would become operational and open for traffic (this is referred to as the Opening Year or the Year of Opening).
 - e. Year 2041 – reflective of the future conditions that would be experienced at a point 15 years after the year of opening of the Scheme (this is referred to as the design year or year 15).
 - f. Year 2086 – reflective of the future conditions that would be experienced at a point 60 years after the year of opening of the Scheme (this is referred to as the lifetime year).

- 4.2.30 For some assessments, the new DMRB standards (Ref 4-10) refer to the future conditions as the do-minimum and do-something scenarios:
- Do-minimum represents the conditions that would exist at a given point in the future without the Scheme in place, but accounting for ongoing maintenance on the road network, the natural evolution of the environment, and the influence that other development projects would have on this.
 - Do-something represents the above conditions, but also with the Scheme in place and operational.

- 4.2.31 Both sets of terminology have been used in the Environmental Statement where applicable to the assessment topic under consideration.

Traffic modelling

Construction traffic

- 4.2.32 In order to estimate the total number of vehicle movements associated with construction of the Scheme, a construction traffic model was developed to establish the likely number of freight vehicles (both light and heavy) and cars that would be added to the road network during each phase of the works.
- 4.2.33 Daily and hourly one-way and two-way movements on the road network were calculated using information provided by the appointed buildability advisor for the Scheme. These movements took account of the planned phasing of the works, plant and equipment requirements, material quantities, construction compound details, worker numbers, working time periods and traffic management measures (see **Chapter 2, The Scheme** of the Environmental Statement [TR010044/APP/6.1]).
- 4.2.34 Assumptions relating to how the Scheme would likely be constructed were factored into the modelling. These included vehicle occupancy rates and the periods over which HGV movements would be distributed on the road network.
- 4.2.35 The calculated movements from the construction traffic model were then used to inform the assessment of construction-related effects within the topics of Air Quality and Noise and Vibration.
- 4.2.36 Further details of the modelling of construction traffic and the parameters used are presented within the Transport Assessment [TR010044/APP/7.2].

Operational traffic

- 4.2.37 A traffic model covering the locality associated with the strategic and local road network was developed to represent the 2015 base year and to forecast future traffic flows in 2025 and 2040⁴, both with and without the Scheme in place. The model represents an average weekday covering the morning peak, inter-peak and evening peak periods.
- 4.2.38 This traffic model is referred to as the A428 Strategic Traffic Model (the Stage 3 Model) and was developed by Highways England using information contained within the following available transport models relating to the geographic area of the Scheme.
- The South East Regional Traffic Model – this traffic model was developed for the south east region of England.
 - The Stage 2 A428 Black Cat to Caxton Gibbet Model – this traffic model was developed to inform the identification, development and selection of route options for the Scheme.
- 4.2.39 The development, calibration and validation of the Stage 3 Model was also informed by:
- Traffic count data – this information was obtained through automatic traffic counts, manual classified link counts, manual turning counts, radar surveys, and automatic number plate recognition surveys.
 - Journey time data – this information was obtained from the Department for Transport’s “Trafficmaster” data.
 - Roadside interviews – this information was obtained from the St Neots Traffic Model.
- 4.2.40 The Stage 3 Model has been used to:
- Establish the minimum engineering requirements of the Scheme.
 - Inform the assessment of accidents.
 - Inform the economic appraisal of the Scheme.

⁴ The EIA has been undertaken based on an opening year of 2026 for the Scheme, in line with the reasonable worst case scenario construction programme presented in **Chapter 2, The Scheme** of the Environmental Statement [TR010044/APP/6.1]. However, traffic modelling undertaken to generate forecasts for the assessments reported in the Environmental Statement [TR010044/APP/6.1] has been based on an opening year of 2025; this being the year assumed at the time of modelling when Scheme construction was expected to be completed (see the Transport Assessment [TR010044/APP/7.2]), which is aligned to the key project milestones. This difference between the opening years does not invalidate the conclusions of the assessments reported in the Environmental Statement [TR010044/APP/6.1] and the Transport Assessment [TR010044/APP/7.2] as the forecast flows on the road network in years 2025 and 2040 are considered to be reasonably representative of the traffic flows that would exist on the network in years 2026 and 2041 respectively.

- d. Produce data in a variety of formats to inform the assessments of effects within the topics of Air Quality, Noise and Vibration, Population and Human Health, and Road Drainage and the Water Environment.
- 4.2.41 Other development projects in the area that could influence future traffic flows on the network were taken account of as part of the modelling process. Information relating to the form, location and status of other development projects was obtained from relevant local authorities, published documents and other publicly available sources for potential inclusion in the traffic model.
- 4.2.42 The development projects identified from these sources were incorporated within an Uncertainty Log⁵ and categorised as follows to determine the level of confidence attached to their delivery.
- Near certain – meaning the development will happen or there is a high probability that it will happen.
 - More than likely – meaning the development is likely to happen but there is some uncertainty.
 - Reasonably foreseeable – meaning the development may happen but there is significant uncertainty.
 - Hypothetical – meaning there is considerable uncertainty as to whether the development will ever happen.
- 4.2.43 Only those other development projects for which delivery was “near certain” or “more than likely” were subsequently taken forward into the Stage 3 Model. As greater confidence exists in the delivery of developments within these two categories (when compared to those categorised as being reasonably foreseeable or hypothetical), these projects were used as the basis for the cumulative effects assessment. Further details regarding the development projects considered within the cumulative effects assessment are presented in **Chapter 15, Assessment of cumulative effects** of the Environmental Statement [TR010044/APP/6.1].
- 4.2.44 Traffic data derived from the modelling process was converted to evening, night time and daily volumes and speeds for use in the environmental assessments. Categories of speeds (termed speed banding) were also calculated to reflect different states of driving conditions in order to provide data required to undertake the Air Quality assessment (see **Chapter 5, Air quality** of the Environmental Statement [TR010044/APP/6.1]).
- 4.2.45 Further details of the modelling of operational traffic and the parameters used are presented within the Transport Assessment [TR010044/APP/7.2].

⁵ This is a record of assumptions made in the traffic model that may affect travel demand and supply, and any uncertainties in the approach to modelling and forecasting.

Other modelling

- 4.2.46 Other forms of computer modelling have been undertaken as part of the EIA within the topics of Air Quality, Noise and Vibration, and Road Drainage and the Water Environment within **Chapters 5, 11 and 13** of the Environmental Statement [TR010044/APP/6.1] respectively.
- 4.2.47 These assessments have used a combination of traffic, monitoring and environmental data (for example climate change predictions) to model the conditions that would occur within the different assessment scenarios and years adopted in the EIA.

Impact identification and assessment

- 4.2.48 Impacts comprise the following identifiable changes to the baseline conditions.
- Direct impact – for example the loss of ecological habitat to accommodate a project.
 - Indirect impact – for example pollution downstream arising from silt deposition during earthworks.
 - Secondary impact – for example changes to ecological species as a result of water pollution.
 - Short-term (or temporary) impact – for example dust generated as a result of construction activities.
 - Medium-term impact – for example the cutting back of planting which is subsequently allowed to regenerate.
 - Long-term (or permanent) impact – for example the introduction of built form that changes the balance of components within an established view.
- 4.2.49 These types of impact have been classified as being either beneficial (positive), for example where the Scheme leads to an improvement in local air quality, or adverse (negative), for example where the Scheme results in the loss of a valuable environmental feature.
- 4.2.50 Impacts have been defined in accordance with accepted terminology and standardised methodologies to predict the magnitude of impact (or change)⁶ resulting from the Scheme.
- 4.2.51 The impact assessments undertaken have been both quantitative and qualitative in nature, depending on the nature of the topic under consideration and the techniques used to identify and predict the magnitude of impacts (or change).
- 4.2.52 For example, the assessment of noise and vibration is inherently quantitative in its approach, having used computer modelling to calculate changes in noise levels resulting from the Scheme. Conversely, the assessment of visual effects is more qualitative in its approach, relying upon the professional judgement, experience, perception and opinion of the individual undertaking the assessment.

⁶ Certain environmental topics within the new DMRB standards (Ref 4-10) refer to magnitude of effect, rather than magnitude of impact (or change), to align with the conventions adopted in other best practice published guidance.

- 4.2.53 An acknowledgement has been made within the impact assessments of any uncertainty or assumptions attached to the prediction of impacts, for example those arising from:
- The extrapolation of information that is incomplete, inconclusive or unrepresentative of normal conditions.
 - The validity of baseline data decreasing with the passage of time.
 - The use of alternative points of reference where data cannot be gathered within a desired geographic location or time period.

- 4.2.54 In instances where high levels of uncertainty exist, a precautionary approach assuming a worst case impact has been adopted.

Environmental mitigation

- 4.2.55 Mitigation is the term to describe measures including any process, activity or design to avoid, prevent, reduce or remediate (offset) the adverse environmental impacts and effects of a development project.
- 4.2.56 The iterative optioneering and design-development processes have sought to apply a mitigation hierarchy by first avoiding and/or preventing (designing-out) potential issues and conflicts between the Scheme and environmental resources and receptors wherever possible, prior to the identification of other mitigation measures necessary to reduce or offset adverse environmental effects.
- 4.2.57 Two categories of mitigation have accordingly been adopted in the EIA:
- Embedded mitigation – these comprise design-based decisions, actions and measures that have been identified to avoid, prevent or reduce the adverse environmental effects of the Scheme.
 - Essential mitigation – these comprise other measures and techniques that have been identified to reduce and, where possible, offset the likely adverse effects of the Scheme.

Embedded mitigation

- 4.2.58 Decisions made during the design-development of the Scheme to avoid or prevent adverse environmental effects are presented in **Chapter 3, Assessment of alternatives** of the Environmental Statement [TR010044/APP/6.1], which summarises how the design has evolved over time and how the EIA process has influenced its final form. Examples include the development of the horizontal alignment of the Scheme to avoid encroachment into environmentally sensitive areas and prevent the loss of environmental features.
- 4.2.59 A range of design-based measures have been identified and embedded into the design of the Scheme for the purpose of reducing environmental effects. Examples of these embedded mitigation measures include:
- The placing of new sections of the highway in earthwork cuttings to reduce traffic-related noise.
 - The incorporation of landscaping to visually screen and contain new highway components.

- c. Minimising the permanent landtake of the Scheme to reduce the loss of ecological habitats.

- 4.2.60 The effectiveness of embedded mitigation measures such as those identified above has been proven on other road schemes developed and implemented on the strategic road network.
- 4.2.61 Efforts have been made during the design-development process to avoid incorporating certain types of embedded mitigation into the design that could themselves generate adverse environmental effects. For example, wooden barriers erected along the sides of a new road can be used to attenuate vehicle noise but can themselves form an intrusive element in existing views.
- 4.2.62 Embedded mitigation measures are described in **Chapter 2, The Scheme** of the Environmental Statement [TR010044/APP/6.1] and are illustrated on the Environmental Masterplan on **Figure 2.4** of the Environmental Statement [TR010044/APP/6.2].
- 4.2.63 Delivery of the Scheme's embedded mitigation measures will be secured through the schedules and requirements contained within the draft DCO [TR010044/APP/3.1].

Essential mitigation

- 4.2.64 Essential mitigation comprises measures that are critical for the delivery of the Scheme and which can be secured and delivered using statutory powers.
- 4.2.65 Essential mitigation has been identified to reduce and, where possible, offset adverse environmental effects where avoidance or prevention has not been possible, or where the EIA process has identified a requirement for further mitigation in addition to that already embedded into the design of the Scheme.
- 4.2.66 Three types of essential mitigation have been identified for delivery and implementation as part of the Scheme:
 - a. Standard mitigation (also referred to as best practice mitigation).
 - b. Additional mitigation (also referred to as further mitigation).
 - c. Offsetting mitigation (also referred to as compensation).
- 4.2.67 Standard mitigation comprises conventional working methods, construction techniques and management activities that would be employed by the Principal Contractor during construction of the Scheme to control and reduce the adverse environmental effects of the Scheme. Standard mitigation includes, for example, controlling working hours to limit construction-related disruption on the road network.
- 4.2.68 Additional mitigation comprises measures that are over and above standard mitigation, the purpose of which are to further reduce the significance of adverse environmental effects. Additional mitigation includes, for example, applying bespoke dust suppression techniques within construction working areas located within 200 metres of sensitive receptors to provide further protection.

- 4.2.69 Offsetting mitigation comprises measures to compensate an environmental effect which cannot be mitigated through other measures. Offsetting mitigation includes, for example, the creation of new ecological habitats specifically to compensate for the loss of irreplaceable habitats.
- 4.2.70 Essential mitigation measures are described within the relevant topic assessments in **Chapters 5 – 14** of the Environmental Statement **[TR010044/APP/6.1]**. Details of the impact control, management and reduction measures to be employed by the Principal Contractor during construction of the Scheme are presented in the First Iteration EMP **[TR010044/APP/6.8]**.
- 4.2.71 The delivery of essential mitigation will be secured through the Requirements contained within Schedule 2 of the draft DCO **[TR010044/APP/3.1]**.

Environmental enhancements

- 4.2.72 Where feasible, environmental enhancements have been incorporated into the design of the Scheme.
- 4.2.73 Enhancements are measures over and above any embedded or essential mitigation measures and are identified to maximise the opportunities to deliver wider environmental benefits in line with the principles of biodiversity net gain⁷ and the commitments made in Highways England's licence (Ref 4-23)⁸, and to meet, where possible, the requirements of the NPSNN (Ref 4-2).
- 4.2.74 Enhancement measures include, for example, the planting of native hedgerows that link into the landscape framework and enhance the existing habitats associated within ecological corridors.
- 4.2.75 Enhancements are reported in **Chapters 5 – 14** of the Environmental Statement **[TR010044/APP/6.1]** and are illustrated on the Environmental Masterplan on **Figure 2.4** of the Environmental Statement **[TR010044/APP/6.2]**.
- 4.2.76 The identification and delivery of environmental enhancements allows effective and valuable environmental benefits to be identified and assists in meeting the aspirations of stakeholders who have an interest in achieving wider environmental benefits on development projects, wherever possible.

Environmental effects

- 4.2.77 Environmental effects are the consequence of impacts. By way of example, an impact arising from a new highway could be represented by a loss of agricultural land to accommodate a new section of carriageway, the effect (or consequence) of which could be compromising the future viability of the holding.

⁷ The *Road Investment Strategy 2 (RIS2): 2020 to 2025* (Ref 4-22) published by the Department for Transport requires Highways England to deliver no net loss of biodiversity across its soft estate over the course of Road Period 2 (covering the financial years 2020/21 to 2024/25), and to continue to progress towards a target of delivering a net gain in biodiversity by 2040.

⁸ The commitment to delivering environmental enhancements is reflected in Highways England's licence (Ref 4-23) which requires Highways England to "*minimise the environmental impacts of operating, maintaining and improving its network and seek to protect and enhance the quality of the surrounding environment*".

- 4.2.78 For an effect to occur a pathway must exist between the impact and the resource or receptor. Effects have therefore been formulated as a function of the importance, value or sensitivity of an environmental resource or receptor, and the magnitude of impact (or change) predicted. A combination of professional judgement, defined thresholds, established criteria and standards has been used in their definition.
- 4.2.79 The criteria presented in Section 4.3 have been used to determine the significance of effects.
- 4.2.80 The significance of an effect has been reported after taking account of the effectiveness of both embedded mitigation and standard mitigation measures, as these comprise measures that would be delivered as an integral component of the design of the Scheme and through the application of best practice techniques during its construction.
- 4.2.81 Where additional mitigation or offsetting mitigation measures are identified as being required, a further assessment has been undertaken and reported to demonstrate their effectiveness in relation to:
- Further reducing the significance of an effect, after embedded and standard mitigation are taken into account.
 - Compensating for an effect that cannot be adequately mitigated through embedded and standard mitigation.
- 4.2.82 Unlike mitigation measures, enhancement measures are not factored into the determination of significance; however, where identified, the potential benefits of these measures are described in **Chapters 5 – 14** of the Environmental Statement [TR010044/APP/6.1].
- 4.2.83 The assignment of significance has relied on reasoned argument, the professional judgement of competent experts, established thresholds and guidelines, and the views of relevant organisations.

Cumulative environmental effects

- 4.2.84 The effects from a development project may not be significant on their own; however, when combined with other effects these could become significant.
- 4.2.85 The EIA has identified that cumulative effects will result from the combination of different activities within the Scheme, and from activities associated with other development projects in the surrounding area.
- 4.2.86 Full details of the methodology, the other development projects identified, and the conclusions of the cumulative assessment are presented in **Chapter 15, Assessment of cumulative effects** of the Environmental Statement [TR010044/APP/6.1].

4.3 Significance criteria

- 4.3.1 Generic criteria contained in *DMRB LA 104 – Environmental Assessment and Monitoring* (Ref 4-24) for sensitivity (or importance/value), magnitude of impact (or change) and significance of effect have been applied across the assessed topics to ensure the identified environmental effects are assessed and evaluated in a comparable manner, except where other prevailing standards, thresholds and/or established criteria have been followed or applied. In such instances, the deviation from the generic criteria is explained within the individual assessment methodologies contained in **Chapters 5 – 14** of the Environmental Statement [TR010044/APP/6.1].
- 4.3.2 **Table 4-1** presents the generic sensitivity (or importance/value) criteria that have been applied in the EIA.

Table 4-1: Environmental value (sensitivity) and typical descriptions

Value (sensitivity) of receptor / resource	Typical description
Very High	Very high importance and rarity, international scale and very limited potential for substitution.
High	High importance and rarity, national scale, and limited potential for substitution.
Medium	Medium or high importance and rarity, regional scale, limited potential for substitution.
Low	Low or medium importance and rarity, local scale.
Negligible	Very low importance and rarity, local scale.

- 4.3.3 **Table 4-2** presents the generic magnitude of impact (or change) criteria that have been applied in the EIA.

Table 4-2: Magnitude of impact (change) and typical descriptions

Magnitude of impact (change)	Typical description	
Major	Adverse	Loss of resource and/or quality and integrity of resource; severe damage to key characteristics, features or elements.
	Beneficial	Large scale or major improvement of resource quality; extensive restoration; major improvement of attribute quality.
Moderate	Adverse	Loss of resource, but not adversely affecting the integrity; partial loss of/damage to key characteristics, features or elements.
	Beneficial	Benefit to, or addition of, key characteristics, features or elements; improvement of attribute quality.

Magnitude of impact (change)		Typical description
Minor	Adverse	Some measurable change in attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements.
	Beneficial	Minor benefit to, or addition of, one (maybe more) key characteristics, features or elements; some beneficial impact on attribute or a reduced risk of negative impact occurring.
Negligible	Adverse	Very minor loss or detrimental alteration to one or more characteristics, features or elements.
	Beneficial	Very minor benefit to or positive addition of one or more characteristics, features or elements.
No Change		No loss or alteration of characteristics, features or elements; no observable impact in either direction.

4.3.4 **Table 4-3** presents the generic significance of effect criteria that have been applied in the EIA.

Table 4-3: Significance of effect categories and typical descriptions

Significance category	Typical description
Very Large	Effects at this level are material in the decision-making process.
Large	Effects at this level are likely to be material in the decision-making process.
Moderate	Effects at this level can be considered to be material decision-making factors.
Slight	Effects at this level are not material in the decision-making process.
Neutral	No effects or those that are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error.

4.3.5 The determination of effect categories has been based on the correlation of the value (sensitivity) with the magnitude of impact (change), as presented in **Table 4-4**.

Table 4-4: Significance of effect matrix

		Magnitude of impact (change)				
		No change	Negligible	Minor	Moderate	Major
Environmental value (sensitivity)	Very High	Neutral	Slight	Moderate or Large	Large or Very Large	Very Large
	High	Neutral	Slight	Slight or Moderate	Moderate or Large	Large or Very Large
	Medium	Neutral	Neutral or Slight	Slight	Moderate	Moderate or Large
	Low	Neutral	Neutral or Slight	Neutral or Slight	Slight	Slight or Moderate
	Negligible	Neutral	Neutral	Neutral or Slight	Neutral or Slight	Slight

4.3.6 The significance of cumulative effects has been ascribed using criteria based on the ratings contained within

4.3.7 **Table 4-3**, the definitions of which are detailed in **Chapter 15, Assessment of cumulative effects** of the Environmental Statement [TR010044/APP/6.1].

4.3.8 Individual and cumulative effects of very large, large or moderate significance are considered to represent ‘significant’ effects in the context of the EIA Regulations (Ref 4-3), except where different criteria or guidance adopted within individual assessments present a different threshold or approach to the determination of a significant effect.

4.4 General assessment assumptions and limitations

4.4.1 in addition to the use of the Rochdale Envelope principles to manage design uncertainty, a number of general limitations and difficulties were encountered when undertaking the EIA. These have influenced how data collection, modelling and assessments have been progressed and reported in the Environmental Statement, and have principally related to:

- a. The availability and accuracy of third-party data, information and records to inform the establishment of baseline conditions.
- b. The timing, coverage and representativeness of field surveys due to the global COVID-19 pandemic and the government-imposed lockdown response in 2020.
- c. The availability of information relating to the construction and delivery of the Scheme, including that relating to existing utilities and statutory undertakers works required as part of the Scheme (see **Chapter 2, The Scheme** of the Environmental Statement [TR010044/APP/6.1]).

- d. The availability of land access to undertake environmental surveys and monitoring in the field to supplement and verify desk-based and third-party information.
- e. The need to undertake certain surveys at sub-optimal times of the year.
- f. The availability and reliability of information regarding other development projects, for inclusion in the cumulative effects assessment (see **Chapter 15, Assessment of cumulative effects** of the Environmental Statement [TR010044/APP/6.1]).

4.4.2 To address these limitations and difficulties, a number of assumptions have needed to be made where information and/or survey access has been lacking or incomplete. These include:

- a. Adopting a precautionary approach in the assessment of impacts and effects where necessary.
- b. Applying worst-case assumptions regarding construction, operation and maintenance of the Scheme.
- c. Using a combination of modelling and professional judgement to predict the baseline conditions that could occur in the future, in the absence of the Scheme.
- d. Extrapolating from data, information and records gathered during the early stages of Scheme optioneering and design-development.

4.4.3 Details regarding the assumptions and limitations adopted within the topic-specific assessments are presented in **Chapter 15, Assessment of cumulative effects** of the Environmental Statement [TR010044/APP/6.1], and those adopted within the cumulative effects assessment are presented in **Chapter 15, Assessment of cumulative effects** of the Environmental Statement [TR010044/APP/6.1].

4.5 Reporting of the assessments

4.5.1 The following common format has been adopted in the reporting of the individual assessments presented in **Chapter 15, Assessment of cumulative effects** of the Environmental Statement [TR010044/APP/6.1].

- a. Competent expert evidence – this section introduces the assessment and provides a brief statement regarding the competency, qualifications and experience of the individual responsible for its production.
- b. Legislative and policy framework – this section summarises relevant legislation and planning policy which has influenced: the assessment methodology followed; the determination of the sensitivity, value and/or importance of resources and receptors; and/or the requirements for mitigation.

- c. Assessment methodology – this section: summarises the scope of the assessment undertaken; presents the methodologies and criteria applied in the assessment; explains (where relevant) any deviation from the generic assessment methodology presented within this chapter; sets out how the process of consultation has influenced the assessment; and explains the scenarios/timescales considered in the assessment.
- d. Assessment assumptions and limitations – this section summarises any assumptions applied and/or any limitations encountered in the assessment, in addition to those presented within this chapter.
- e. Study area – this section sets out the spatial extents of the study area(s) used in the assessment.
- f. Baseline conditions – this section presents information on the existing and future environmental conditions associated with the study area(s).
- g. Potential impacts – this section presents the potential environmental impacts that are likely to occur as a result of the Scheme, and which have been considered within the assessment.
- h. Mitigation and enhancement measures – this section summarises the embedded measures relating to the topic, describes any essential mitigation measures identified and details any environmental enhancement measures.
- i. Assessment of likely significant effects – this section presents the likely significant effects (both adverse and beneficial) predicted to occur as a result of the Scheme after the application of embedded and essential mitigation; and any benefits arising from the delivery of environmental enhancements (where identified).

4.5.2 The reporting of the cumulative effects assessment in **Chapter 15, Assessment of cumulative effects** of the Environmental Statement [TR010044/APP/6.1] has adopted the following format.

- a. Competent expert evidence – this section introduces the assessment and provides a brief statement regarding the competency, qualifications and experience of the individual responsible for its production.
- b. Cumulative assessment methodology – this section details: the scope of the assessment in relation to its spatial and temporal extents; the process by which other development projects have been identified and considered in the assessment; and the methodologies applied to identify combined and cumulative effects.
- c. Assessment assumptions and limitations – this section summarises any assumptions applied, and/or any limitations encountered in the assessment.
- d. Assessment of combined effects – this section presents the outcomes of the assessment in relation to effect interactions on environmental resources and receptors.

- e. Assessment of cumulative effects with other developments – this section presents the outcomes of the assessment in relation to the cumulative effects of the Scheme and other development projects.

4.6 Monitoring of significant adverse effects

- 4.6.1 Where significant adverse effects on the environment are predicted, proportionate monitoring measures have been identified in accordance with the requirements of the EIA Regulations (Ref 4-3).
- 4.6.2 The purpose of these measures is to:
 - a. Ensure the embedded and essential mitigation measures required to avoid, prevent, reduce and offset significant adverse effects on the environment are delivered.
 - b. Build data on the effectiveness of mitigation measures.
 - c. Satisfy licence and/or permit requirements where applicable.
 - d. Identify remedial action(s) as a consequence of the underperformance or failure of mitigation measures.
- 4.6.3 Details of the procedures to be implemented during and post-construction of the Scheme to monitor significant adverse effects – both individual and cumulative – are presented within the First Iteration EMP [TR010044/APP/6.8] and the Schedule of Mitigation [TR010044/APP/6.9].

4.7 Duplication of assessment

- 4.7.1 Information gathered and assessed as part of the EIA process has been used to inform the following assessments and their reporting.
 - a. Habitats Regulations Assessment: No Significant Effects Report [TR010044/APP/6.7] – this assessment has referenced the information gathered as part of the:
 - i. Air quality assessment, reported in **Chapter 5, Air quality** of the Environmental Statement [TR010044/APP/6.1].
 - ii. Biodiversity assessment, reported in **Chapter 8, Biodiversity** of the Environmental Statement [TR010044/APP/6.1].
 - iii. Noise and vibration reported, in **Chapter 11, Noise and vibration** of the Environmental Statement [TR010044/APP/6.1].
 - iv. Road drainage and the water environment assessment, reported in **Chapter 13, Road drainage and the water environment** of the Environmental Statement [TR010044/APP/6.1].

- b. Water Framework Directive Assessment in **Appendix 13.1** of the Environmental Statement [TR010044/APP/6.3] – this assessment has referenced the information gathered as part of the Road Drainage and the Water Environment assessment, reported in **Chapter 13, Road drainage and the water environment** of the Environmental Statement [TR010044/APP/6.1].
- c. Flood Risk Assessment in **Appendix 13.4** of the Environmental Statement [TR010044/APP/6.3] – the modelling and assessment of flood risk has referenced the information gathered as part of the Road drainage and the water environment assessment, reported in **Chapter 13, Road drainage and the water environment** of the Environmental Statement [TR010044/APP/6.1].
- d. Transboundary Effects Screening in **Appendix 4.1** of the Environmental Statement [TR010044/APP/6.3] – this exercise has referenced the information gathered as part of the Biodiversity assessment, reported in **Chapter 8, Biodiversity** of the Environmental Statement [TR010044/APP/6.1].
- e. Major Accidents and Disasters Screening in **Appendix 4.2** of the Environmental Statement [TR010044/APP/6.3] – this exercise has referenced the information gathered as part of all topic assessments, reported in **Chapters 5 to 14** of the Environmental Statement [TR010044/APP/6.1].
- f. Case for the Scheme [TR010044/APP/7.1] – this document has referenced the outcomes of the EIA process to inform a detailed review and appraisal of the Scheme’s compliance with national and local planning policy.

4.8 References

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- Ref 4-4 Design Manual for Roads and Bridges: Volume 11. Highways England (1993 – 2019) [WITHDRAWN].
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