

A1 in Northumberland: Morpeth to Ellingham

Scheme Number: TR010041

6.1 Environmental Statement – Chapter 4 Environmental Assessment Methodology

APFP Regulation 5(2)(a)

Planning Act 2008

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

June 2020

Infrastructure Planning

Planning Act 2008

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

**The A1 in Northumberland: Morpeth to Ellingham
Development Consent Order 20[xx]**

Environmental Statement

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4. ENVIRONMENTAL ASSESSMENT METHODOLOGY

4.1. OVERVIEW

- 4.1.1. Environmental Impact Assessment (EIA) is a process for identifying the likely environmental effects (beneficial and adverse) of a proposed development, and their significance, before development consent is granted.
- 4.1.2. The Design Manual for Roads and Bridges (DMRB), including any Interim Advice Notes (IANs), has been used as the main source of guidance, with relevant discipline-specific guidance used as appropriate for this EIA. In particular, the guidance contained in DMRB Volume 11 Section 3 Environmental Assessment has been used (**Ref. 4.1**). DMRB Volume 10 which contains guidance on Environmental Design and Management has also been used to inform topic areas as appropriate.
- 4.1.3. Some DMRB guidance documents were updated in 2019 and 2020 (and associated IANs replaced), by which time the EIA for the Scheme was largely complete. However, a sensitivity test has been undertaken in April / May 2020 by the Applicant either to demonstrate that the assessments reported in this Environmental Statement (ES) are already compliant with the updated guidance, or to identify any changes to the conclusions of the assessments as a result of the updated guidance (determined through further assessment). The findings of the sensitivity test are reported in this ES (refer to **paragraphs 4.3.3 and 4.3.4** for further details).
- 4.1.4. In addition, the EIA reported in this ES is consistent with the **Scoping Report (Application Document Reference: TR010041/APP/6.10)** for Part A: Morpeth to Felton (Part A), the **Scoping Report (Application Document Reference: TR010041/APP/6.11)** for Part B: Alnwick to Ellingham (Part B), the **Scoping Opinion (Application Document Reference: TR010041/APP/6.12)** for Part A and the **Scoping Opinion (Application Document Reference: TR010041/APP/6.13)** for Part B.
- 4.1.5. This chapter describes how the relevant law and guidance has been applied in the EIA that has led to the production of this ES.
- 4.1.6. Details of the Scheme location are provided on the **Location Plan (Application Document Reference: TR010041/APP/2.1)**. Location plans are also provided in **Figure 1.1: Location Plan: Part A** of this ES and in **Figure 1.2: Location Plan: Part B** of this ES. The Order Limits, as depicted by the red line on these plans, comprise all land (both temporary and permanent) required to build and operate the Scheme. When Order Limits are referenced in this ES, the context affects which limits are being referenced. In the chapters of the ES that deal with Part A, a reference to the Order Limits refers to the Order Limits of Part A. References to the Order Limits in chapters dealing with Part B refer to the Order Limits of that part. In **Technical Chapters 5 to 15, Volume 2** of this ES (**Application Document Reference: TR010041/APP/6.2**) and **Technical Chapters 5 to 15, Volume 3** of this ES (**Application Document Reference: TR010041/APP/6.3**), where it is intended to refer to

the Order Limits of both parts, i.e. the Order Limits of the Scheme as a whole, this is expressly referenced.

- 4.1.7. The following are illustrated on **Figure 4.1: Boundary Plan: Part A** of this ES and on **Figure 4.2: Boundary Plan: Part B** of this ES, and also on the **Land Plans (Application Document Reference: TR010041/APP/2.2)**, which show the definitive permanent and temporary acquisition boundaries):
- a. The Order Limits (depicted as a red line), which were previously referred to as the ‘red line boundary’ within the **Scoping Report (Application Document Reference: TR010041/APP/6.10)** for Part A, the **Scoping Report (Application Document Reference: TR010041/APP/6.11)** for Part B and the **Preliminary Environmental Information Reports (PEIRs)** for Part A and Part B (refer to **Appendix J** of the **Consultation Report (Application Document Reference: TR010041/APP/5.2)**).
 - b. Indicative land to be permanently acquired by the Applicant for the Scheme (refer to **Chapter 2: The Scheme** of this ES).
- 4.1.8. The potential effects upon the environment as a result of the permanent and temporary works comprised in the Scheme have been considered within this ES. For the potential effects of permanent works in Part A **Technical Chapters 5 to 15, Volume 2** of this ES (**Application Document Reference: TR010041/APP/6.2**) and the permanent works in Part B **Technical Chapters 5 to 15, Volume 3** of this ES (**Application Document Reference: TR010041/APP/6.3**), unless otherwise stated, the indicative permanent boundary depicted on **Figure 4.1: Boundary Plan: Part A** of this ES and in **Figure 4.2: Boundary Plan: Part B** of this ES has been used for assessment purposes. Where necessary, reasonable worst case assumptions have been made to ensure sufficiency of data for all land within the indicative permanent boundary, for instance if additional survey data were not available for small areas within such boundaries.
- 4.1.9. Some of the supporting work to the ES uses a different assessment boundary to the Order Limits. In most circumstances the Order Limits are narrower than such assessment boundaries, although there are instances where the Order Limits are wider. This occurs where Order Limits have been extended to cover land that was not the subject of the original assessment boundary. In these cases, assessment has been undertaken using a worst-case assumption in respect of the additional land that has been included, and the approach has been consulted upon and agreed with relevant consultees. Further details are presented within the relevant **Technical Chapters 5 to 15, Volume 2** of this ES (**Application Document Reference: TR010041/APP/6.2**) and **Technical Chapters 5 to 15, Volume 3** of this ES (**Application Document Reference: TR010041/APP/6.3**).
- 4.1.10. To enable the EIA to be undertaken, future traffic levels are predicted. This is usually undertaken for the opening year and the design year, which is conventionally taken as the fifteenth year after opening. For the Scheme, this was undertaken using economic projections and known developments based upon an opening year predicted to be in 2023 and a consequent design year of 2038. Since that time, the opening year has been put back to 2024. Updated Goods Vehicle Growth from DfT Road Traffic Forecasts (2018) have also

become available. Therefore, the Applicant has considered whether the predictions made using an opening year of 2023 are materially affected by this change. A sensitivity analysis was carried out, in order to test whether these predicted traffic levels would materially affect assessments for the revised opening year and design year. The result of this sensitivity analysis was that there would be increases in vehicle movements (up to 4%) in the opening year (2024), and a decrease in predicted vehicle movements (up to 3%) in the design year (2039). Based on this level of change, the traffic data used to support the ES can be considered to be a reasonable representation of traffic in the new opening year of 2024. Therefore there is not anticipated to be a material change in outcomes of those assessments that use traffic data, and the results and conclusions to date are considered to reasonably represent the impacts in 2024.

4.2. ENVIRONMENTAL SCOPING

SCREENING

- 4.2.1. As identified in **Chapter 1: Introduction** of this ES, the Scheme falls within the criteria listed in Schedule 1 of the EIA Regulations (**Ref. 4.2**), under Schedule 1 Part 7(3):
- 4.2.2. “Construction of a new road of four or more lanes, or realignment and/or widening of an existing road of two lanes or less so as to provide four or more lanes, where such new road, or realigned and/or widened section of road would be 10 kilometres or more in a continuous length.”
- 4.2.3. Under Regulation 4 of the EIA Regulations, an EIA is required for EIA development, which includes Schedule 1 development. As explained in **Chapter 1: Introduction** of this ES, the Scheme was originally being progressed by means of separate Development Consent Orders (DCOs) and separate screening determinations were also obtained for Part A and Part B.

Part A

- 4.2.4. Part A would be classified as a Schedule 1 development under paragraph 7(3) of Schedule 1 of the EIA Regulations (**Ref. 4.2**). An EIA Screening determination exercise was undertaken by the Applicant in 2017 and concluded that Part A would likely result in significant environmental effects.

Part B

- 4.2.5. Part B would fall within Schedule 2, Paragraph 13(b)(i) (change or extension) of the EIA Regulations (**Ref. 4.2**). An EIA screening exercise was undertaken for Part B in October 2018, which identified that Part B could potentially have significant adverse effects in relation to noise and vibration, landscape and visual amenity, cultural heritage, ecology, water environment, population and human health, and climate. It was also identified that Part B had potential for direct impacts on ‘*sites of historical, cultural or archaeological significance*’ as set out in Regulation 9(1). Therefore, Part B was considered to be an ‘EIA Development’ and would require an EIA.

- 4.2.6. A Regulation 8(1)(b) notice was issued to the Planning Inspectorate (the Inspectorate) in October 2018 to notify them that the Applicant proposed an ES in respect of Part B.

The Scheme

- 4.2.7. As Part A and Part B are now being progressed as a single Scheme, and Part A has already been established to be Schedule 1 development, it follows that overall the Scheme is classified as a Schedule 1 development under paragraph 7(3) of Schedule 1 of the EIA Regulations (**Ref. 4.2**).

SCOPING

- 4.2.8. Scoping exercises were carried out for Part A and for Part B in accordance with Regulation 10(1) of the EIA Regulations (**Ref. 4.2**). This reflects the history of the Scheme, which was originally being progressed through two separate applications for DCOs which have now been combined into the current single Scheme.
- 4.2.9. The purpose of scoping is to identify the scope of the EIA and to support the request for feedback on any additional information to be provided in the ES in support of the Scheme's application for a DCO.
- 4.2.10. The **Scoping Report (Application Document Reference: TR010041/APP/6.10)** for Part A was submitted to the Inspectorate on 25 January 2018 with a request for a statutory Scoping Opinion. The **Scoping Opinion (Application Document Reference: TR010041/APP/6.12)** was received on 7 March 2018.
- 4.2.11. The **Scoping Report (Application Document Reference: TR010041/APP/6.11)** for Part B was submitted to the Inspectorate on 7 November 2018 with a request for a statutory Scoping Opinion. The **Scoping Opinion (Application Document Reference: TR010041/APP/6.13)** was received on 18 December 2018.
- 4.2.12. In accordance with the EIA Regulations (**Ref. 4.2**), this ES has been based on the **Scoping Opinion (Application Document Reference:TR010041/APP/6.12)** for Part A and the **Scoping Opinion (Application Document Reference:TR010041/APP/6.13)** for Part B, both of which have also been used to inform the topics that the EIA has assessed. The Scoping Opinions for Part A and Part B provide sufficient certainty as to the matters to be addressed in the EIA and reported in this ES for the Scheme as a whole.
- 4.2.13. During the preparation of the **Scoping Reports** for Part A (**Application Document Reference: TR010041/APP/6.10**) and Part B (**Application Document Reference: TR010041/APP/6.11**), non-statutory consultation and engagement with relevant stakeholders (including statutory bodies) took place to identify key environmental issues that needed to be assessed in detail and to inform baseline information and survey requirements. Stakeholders who were consulted included (applies to both Part A and Part B unless stated otherwise):
- a. Natural England in relation to the Biodiversity assessment, geologically designated sites, agricultural land and the proposed River Coquet Bridge (for Part A).

- b.** Environment Agency in relation to the Road Drainage and the Water Environment assessment, water related Ecology and the proposed River Coquet Bridge (for Part A).
- c.** Lead Local Flood Authority (LLFA) (Northumberland County Council (NCC) in relation to the Road Drainage and Water Environment assessment.
- d.** NCC County Archaeologist in relation to the geophysical survey methodology, the Cultural Heritage assessment and the draft Written Scheme of Investigation (WSI) for the Scheme and National Grid works.
- e.** Historic England in relation to the Cultural Heritage assessment.
- f.** NCC County Ecologist in relation to the Biodiversity assessment.
- g.** NCC Environmental Protection Officer in relation to the Air Quality assessment, Noise and Vibration assessment as well as the Geology and Soils assessment.
- h.** NCC Waste team in relation to the Material Resources assessment.
- i.** NCC in relation to the Landscape and Visual assessment and the Population and Human Health assessment.

4.2.14. This ES has been prepared in accordance with the scope set out in the **Scoping Report (Application Document Reference: TR010041/APP/6.10)** for Part A, the **Scoping Report (Application Document Reference: TR010041/APP/6.11)** for Part B, the **Scoping Opinion (Application Document Reference: TR010041/APP/6.12)** for Part A and the **Scoping Opinion (Application Document Reference: TR010041/APP/6.13)** for Part B received from the Inspectorate. The Scoping Opinion Response Tracker for Part A and Part B within **Appendix 4.1: Scoping Opinion Response Tracker** of this ES presents the Inspectorate's Scoping Opinions together with commentary of how each item has been addressed within the EIA / ES.

POST SCOPING CONSULTATION

Section 42, 47 and 48 Statutory Consultation

- 4.2.15. The DCO process requires pre-application statutory consultation to be undertaken prior to the submission of an application for a DCO. The purpose of the consultation was to invite consultees to participate and respond to the Scheme proposals. Under the 2008 Act (**Ref. 4.3**), there are three elements to pre-application statutory consultation:
- a.** Section 42 consultation with prescribed consultees, local authorities, landowners and others with interests in land and significantly affected persons.
 - b.** Section 47 consultation with the local community in accordance with the Statement of Community Consultation (SoCC) (refer to **Appendix F** of the **Consultation Report (Application Document Reference: TR010041/APP/5.2)**).
 - c.** Section 48 notice, which is a requirement to publish statutory notice of the proposed application for a DCO in prescribed publications.
- 4.2.16. The Section 47 consultation was carried out at the same time as the Section 42 consultation for Part A. The Applicant held a statutory period of consultation in accordance with Section 42 and Section 47 of the 2008 Act (**Ref. 4.3**) for a period of 42 days from 18 June 2018 to 29 July 2018.
- 4.2.17. For Part B, the Section 47 consultation was also carried out at the same time as the Section 42 consultation. The Applicant held a statutory period of consultation in accordance with

Section 42 and Section 47 of the 2008 Act (**Ref. 4.3**) for a period of 42 days from 25 February 2018 to 8 April 2019.

- 4.2.18. As part of this process, the Part A PEIR and the Part B PEIR (refer to **Appendix J** of the **Consultation Report (Application Document Reference: TR010041/APP/5.2)**) and associated PEIR Non-Technical Summaries were produced to provide a preliminary review of the likely environmental effects of both Part A and Part B. Responses made to the PEIRs have been taken into consideration throughout the development of the Scheme design and in preparing the ES.
- 4.2.19. For Part A, the Section 48 statutory consultation notices (newspaper notices) were published during June 2018 via publications in one local (Northumberland Gazette) (2 week publication) and one national newspaper (The Times) (2 week publication), and the London Gazette (1 week publication).
- 4.2.20. For Part B, the Section 48 statutory consultation notices (newspaper notices) were published during February 2019 via publications in one local (Northumberland Gazette) (2 week publication) and one national newspaper (The Times) (2 week publication), and during August 2019 in the London Gazette (1 week publication).
- 4.2.21. As Part A and Part B are now being progressed as a single Scheme, further section 42 and Section 47 statutory consultation for the Scheme was carried out for a 28 day' period from 16 April 2020 to 21 May 2020. As part of this process, an updated PEIR (refer to **Appendix J** of the **Consultation Report (Application Document Reference: TR010041/APP/5.2)**) was produced to provide a preliminary review of the likely environmental effects of the Scheme. Responses made to the PEIR during the latest consultation have been taken into consideration in the subsequent finalisation of the Scheme design and in preparing the ES.
- 4.2.22. In addition, Section 48 statutory consultation notices (newspaper notices) for the Scheme were published during April 2020 via publications in one local (Northumberland Gazette) (2 week publication) and one national newspaper (The Times) (2 week publication), and the London Gazette (1 week publication).
- 4.2.23. Further information on how the responses received to the statutory consultation have influenced the Scheme design is available in the **Consultation Report (Application Document Reference: TR010041/APP/5.1)**.

Non-Statutory Consultation

- 4.2.24. Where relevant, since the production of the **Scoping Report (Application Document Reference: TR010041/APP/6.10)** for Part A and the **Scoping Report (Application Document Reference: TR010041/APP/6.11)** for Part B, additional non-statutory consultation and ongoing engagement have been conducted on a continual basis throughout the EIA as follows:
- a. LLFA (NCC), in relation to the Road Drainage and Water Environment assessment.

- b.** Environment Agency in relation to the Road Drainage and Water Environment assessment and the Biodiversity assessment (relating to particular water borne ecology surveys and mitigation).
 - c.** Natural England in relation to ecology surveys undertaken, assessment/methodology, potential impacts upon ecology and mitigation (including the measures proposed to address the potential impacts upon ancient woodland in relation to Part A) as presented within **Appendix 9.21: Ancient Woodland Strategy, Volume 7** of this ES (**Application Document Reference: TR010041/APP/6.7**).
 - d.** NCC County Archaeologist and Historic England in relation to the Cultural Heritage assessment, specifically in relation to the Desk-Based Assessment (DBA) and mitigation, and also in relation to pre-application trial trenching which took place in Part B.
 - e.** NCC Environmental Protection Officer in relation to the Air Quality assessment and the Noise and Vibration Assessment.
 - f.** NCC in relation to an Environmental Information Request for the Geology and Soils assessment.
 - g.** NCC Landscape Officers, Natural England, Northumberland National Park Authority and Historic England (for Part B) in relation to the Landscape and Visual assessment, specifically proposed viewpoints, and methodology.
 - h.** The Forestry Commission in relation to the measures proposed to address the potential impacts upon ancient woodland in relation to Part A.
 - i.** The Woodland Trust in relation to the measures proposed to address the potential impacts upon ancient woodland in relation to Part A.
 - j.** Northumbria Bird Ringing Group in relation to barn owl mitigation for Part A.
 - k.** NCC Public Rights of Way (PRoW) Officer in relation to the Population and Human Health assessment methodology.
 - l.** Northumberland Wildlife Trust in relation to the Biodiversity assessment and regarding barn owl mitigation and Local Wildlife Site citations for Part A.
 - m.** The Ramblers Association in relation to the Population and Human Health assessment.
 - n.** Sustrans in relation to the Population and Human Health assessment.
 - o.** The British Horse Society in relation to the Population and Human Health assessment.
 - p.** NCC in relation to the assessment methodology for the cumulative assessment.
- 4.2.25. **Technical Chapters 5 to 15, Volume 2** of this ES (**Application Document Reference: TR010041/APP/6.2**) for Part A and of **Volume 3** of this ES (**Application Document Reference: TR010041/APP/6.3**) for Part B provide further details of consultation relevant to the respective environmental topic. Refer to **Appendix 4.2: Environmental Consultation** of this ES for records of the consultation for Part A and Part B.
- 4.2.26. There will be further opportunities to comment on this ES and to participate in the examination of this DCO application. Details of the examination will be published on the Inspectorate's website: <https://infrastructure.planninginspectorate.gov.uk/projects/north-east/a1-in-northumberland-morpeth-to-ellingham/>.

TOPICS CONSIDERED IN THE ES

- 4.2.27. The environmental topics that have been assessed within the EIA and reported in this ES comprise the following, in accordance with the DMRB Volume 11, IAN 125/15 (**Ref. 4.4**), the

Scoping Report (Application Document Reference: TR010041/APP/6.10) for Part A and the **Scoping Report (Application Document Reference: TR010041/APP/6.11)** for Part B:

- a. Air Quality
- b. Noise and Vibration
- c. Landscape and Visual
- d. Cultural Heritage
- e. Biodiversity
- f. Road Drainage and the Water Environment
- g. Geology and Soils
- h. Population and Human Health
- i. Material Resources
- j. Climate
- k. Cumulative Effects

Health

- 4.2.28. Schedule 4 Part 5 of the EIA Regulations (**Ref. 4.2**) requires a description of the likely significant effects on the environment resulting from, amongst others, the risks to human health.
- 4.2.29. The likely impacts of the Scheme on health is considered within **Chapter 12: Population and Human Health, Volume 2** of this ES (**Application Document Reference: TR010041/APP/6.2**) and **Chapter 12: Population and Human Health, Volume 3** of this ES (**Application Document Reference: TR010041/APP/6.3**) and not in the individual environmental topics.
- 4.2.30. It should be noted that the **Scoping Report (Application Document Reference: TR010041/APP/6.10)** for Part A set out that potential health effects would be reported in **Chapter 15: Assessment of Combined Effects, Volume 2** of this ES (**Application Document Reference: TR010041/APP/6.2**), however it was subsequently decided that this information is better presented in **Chapter 12: Population and Human Health, Volume 2** of this ES (**Application Document Reference: TR010041/APP/6.2**). The scope of the assessment of health remains the same as set out in the Scoping Report.

Electric and Magnetic Fields

- 4.2.31. As part of the **Scoping Opinion (Application Document Reference: TR010041/APP/6.12)** for Part A and the **Scoping Opinion (Application Document Reference: TR010041/APP/6.13)** for Part B, Public Health England recommended the consideration of Electric and Magnetic Fields (EMF) in the ES.
- 4.2.32. For Part A, as part of the works to divert the existing National Grid gas transmission pipeline to the south of the proposed Causey Park Overbridge, the diversion of a section of the Northern PowerGrid 20 kV low voltage underground electrical distribution circuit would be required. Refer to **Chapter 2: The Scheme** of this ES for further details.
- 4.2.33. For Part B, as part of the works to divert existing electricity services, the diversion of the Extra High Voltage (EHV) cables that runs between Middlemoor Wind Farm and Denwick

Primary Substation would be required. Refer to **Chapter 2: The Scheme** of this ES for further details.

Methodology

- 4.2.34. In the UK there are no statutory regulations to limit the exposure of people to power-frequency electric or magnetic fields. However, in 2004 the National Radiological Protection Board (NRPB) provided advice to the Government, recommending the adoption in the UK of guidelines published in 1998 by the International Commission on Non-Ionizing Radiation Protection (ICNIRP). The 1998 ICNIRP exposure guidelines set limits on induced current density in the central nervous system for the public which should not be exceeded. The industry Code of Practice on Compliance (Department for Energy and Climate Change (DECC) 2012 (**Ref. 4.5**)) provides guidance on when specific evidence of compliance with the ICNIRP exposure guidelines is required, indicating types of equipment where the design is such that it is not capable of exceeding the ICNIRP exposure guidelines.
- 4.2.35. To determine whether the Scheme has the potential to generate EMF above exposure guidelines, both Part A and Part B have been reviewed against the Code of Practice on Compliance criteria.

Findings

- 4.2.36. The Code of Practice states that compliance with the 1998 ICNIRP exposure guidelines is assumed for overhead power lines at voltages up to and including 132 kV unless there is evidence brought to the contrary.
- 4.2.37. For Part A, as the new Northern PowerGrid 20 kV underground cable circuit has a voltage below 132 kV and is of standard construction, it is considered further calculations are not required.
- 4.2.38. For Part B, as the diverted 66 kV EHV cables have a voltage below 132 kV and is of standard construction, further calculations are not required.
- 4.2.39. Based upon the initial assessment, it is considered that the diversion of the 20 kV underground circuit for Part A and the diversion of the 66 kV EHV cables for Part B would be compliant with the above EMF exposure guidelines and have therefore been scoped out of further assessment.

Major Accidents and Disasters

- 4.2.40. Paragraph 5(d) of Schedule 4 to the EIA Regulations (**Ref. 4.2**) requires an assessment of the likely significant effects of the Scheme on the environment resulting from the risks to human health, cultural heritage or the environment due to, for example, major accidents or disasters.
- 4.2.41. Paragraph 8 of Schedule 4 to the EIA Regulations (**Ref. 4.2**) require that “the vulnerability of the development to the risk of major accidents and disasters” is considered and a description of “the expected significant adverse effects of the development on the environment” deriving from this vulnerability is provided. Therefore, for an event which

meets the criteria of a foreseeable major accident and disaster, the risk of it actually happening has to be as low as reasonably practicable (ALARP) to be a tolerable risk to be acceptable to regulators and/or society. Where any risk might not have been ALARP, this has then been addressed by appropriate changes to the design of the Scheme, introduction of mitigation or identification of emergency response measures to make it ALARP. As such, there should be no major accident or disaster risk that is not ALARP.

Part A

- 4.2.42. An assessment of major accidents and disasters has been carried out for Part A and is provided in **Appendix 4.3: Major Accidents and Disasters Assessment** of this ES.
- 4.2.43. Nine major events during construction and four major events during operation, to which Part A may be vulnerable, were identified and these are detailed in **Table 4-1** and **Table 4-2**. Based on the assumptions and mitigation measures as detailed in **Appendix 4.3: Major Accidents and Disasters Assessment** of this ES, it is considered that each of these events will be managed to be ALARP.

Table 4-1 - Potential Major Risk Events – Construction Phase: Part A

Risk Record Entry Number (refer to Appendix 4.3: Major Accidents and Disasters Assessment for numbering)	MAD Scoping Group and Category	Risk Event (High Level)	Hazard Description	Hazard Sources and/or Pathways	Risk Description	Reasonable Worst Consequence if Event Did Occur	ES Topic (Volume 2 of this ES (Application Document Reference: TR010041/APP/6.2))
0	Natural Hazards: Hydrology	Extreme weather (flood)	Surface water flooding.	Heavy precipitation on Part A which the drainage network cannot cope with risks due to blockage, channel roughness, downstream water and exceedance events.	A review of the Environment Agency Flood Risk from Surface Water map indicates that sections of Part A are at high, medium and low risk of flooding from surface water sources. The Highways Agency Drainage Data Management System (HADDMS) online database indicates that the Morpeth to Felton section of the existing A1 has eight documented historical surface water flood events of which 2 are detailed as high severity events resulting in the total closure of the carriageway.	Death and / or injury to road users.	Road drainage and water environment Population and Human Health Geology and soils
9	Technological or Manmade Hazards: Transport Accidents	Collapse / damage to structures	Restricted access causing difficulties with manoeuvring heavy construction plant. Increased traffic.	Construction activities adjacent to existing structures and live roads.	Damage to existing road infrastructure leading to injury of member of the public or workers.	Collapse/impact leads to harm to members of public.	Population and Human Health
13	Technological or Manmade Hazards: Major Accident Hazard Pipelines	Fire and / or explosion or release of harmful gas	Presence of underground services/utilities -sewers, gas, electricity, potable water, telecoms/data and surface/storm water drainage.	Presence of existing utilities within Part A which are nearby to residential and commercial properties.	Striking of underground services/utilities.	Fire and/or explosion affects neighbouring property and/or members of the public.	Population and Human Health Geology and soils
14	Technological or Manmade Hazards: Major Accident Hazard Pipelines	Fire and / or explosion or release of harmful gas	Presence of underground cross-country gas high pressure pipeline (National Grid Gas PLC Feeder Main 13 Simprim/Corbridge).	Presence of underground cross-country gas high pressure pipeline (National Grid Gas PLC Feeder Main 13 Simprim/Corbridge near residential properties in proximity to Helm.	Striking of underground services/utilities.	Fire and/or explosion affects neighbouring property and/or members of the public.	Population and Human Health Geology and soils

Risk Record Entry Number (refer to Appendix 4.3: Major Accidents and Disasters Assessment for numbering)	MAD Scoping Group and Category	Risk Event (High Level)	Hazard Description	Hazard Sources and/or Pathways	Risk Description	Reasonable Worst Consequence if Event Did Occur	ES Topic (Volume 2 of this ES (Application Document Reference: TR010041/APP/6.2))
18	Technological or Manmade Hazards: Industrial and Urban Accidents	Harm to people	Earthworks and construction activities (e.g. overturning of crane / dropped load) adjacent to operational areas of the existing structures.	Construction activities adjacent to existing structures and live roads.	Damage to highway infrastructure leading to death and/or injury of workers and road users.	Collapse/impact leads to harm to construction and other workers and road users in the vicinity.	Population and Human Health
24	Technological or Manmade Hazards: Major Accident Hazard Pipelines	Major road traffic accident and large scale gas release	Modified existing gas pipeline beneath A1.	Modified pipeline shifting or collapsing.	Destabilisation of A1 leading to collapse and potential gas explosion due to vehicles igniting released gas.	Death and / or injury to road users.	Population and Human Health
25	Technological or Manmade Hazards: Malicious Attacks	Fire and / or explosion or release of harmful gas	Unexploded ordnance.	Presence of unexploded ordnance.	During ground investigation or construction discovering UXO. Borehole drilling rigs encountering buried ordnance and force and vibration causing explosion.	Fire and/or explosion affects neighbouring property and/or those people in the immediate area.	Population and Human Health Biodiversity Cultural heritage
41	Technological or Manmade Hazards: Transport accidents	Major road traffic accident	Existing road bridges loaded with additional construction traffic e.g. piling rigs.	Debris striking traffic / member of public.	Unknown safe capacity of road bridges - Overloading leading to structural instability - injuries to road users and construction personnel.	Death and / or injury to members of the public	Population and Human Health
42	Technological or Manmade Hazards: Transport accidents	Major road traffic accident Collapse / damage to structure	Phased construction of bridge in immediate proximity of operational public highway.	Falling objects cause road traffic accident.	1) Injury to third parties. 2) Debris falling on public highway resulting in accident. 3) Damage to third party utilities / services located on or near bridges.	Death and / or injury to members of the public	Population and Human Health

Table 4-2 - Potential Major Risk Events – Operational and/or Maintenance Phases: Part A

Risk Record Entry Number (refer to Appendix 4.3: Major Accidents and Disasters Assessment for numbering)	MAD Scoping Group & Category	Risk Event (High Level)	Hazard Description	Hazard Sources and/or Pathways	Risk Description	Reasonable Worst Consequence if Event Did Occur	ES Topic (Volume 2 of this ES (Application Document Reference: TR010041/APP/6.2))
4	Natural Hazards: Hydrology	Collapse / damage to structures	Fluvial flooding.	Flooding of the River Coquet.	Flooding leading to damage to infrastructure and deterioration of materials (e.g. scouring and erosion of embankments). The northbound abutment for the River Coquet Bridge has been the subject of an assessment during recent maintenance periods. The geomorphological map outlines the area where rotational slips have occurred within the bedrock and superficial soils. Potential slope failures in this area will be a key risk for the development of the design for this proposal.	Death and / or injury to members of the public.	Climate Road drainage and water environment
5	Natural Hazards: Hydrology	Extreme weather (flood)	Surface water flooding.	Heavy precipitation on Part A which the drainage network cannot cope with risks due to blockage, channel roughness, downstream water and exceedance events.	A review of the Environment Agency Flood Risk from Surface Water map indicates that sections of Part A are at high, medium and low risk of flooding from surface water sources. The HADDMS online database indicates that the Morpeth to Felton section of the existing A1 has eight documented historical surface water flood events of which 2 are detailed as high severity events resulting in the total closure of the carriageway.	Death and / or injury to road users.	Population and Human Health Geology and soils Road drainage and water environment
10	Technological or Manmade Hazards: Industrial and Urban Accidents	Collapse / damage to structures	Presence of unrecorded mine workings. The entire route corridor has been assessed to have moderate risk associated with the presence of shallow mine workings.	Mine workings.	Collapse of a mine workings leading to collapse of the roadway into a void.	Death and / or injury to members of the public.	Population and Human Health

Risk Record Entry Number (refer to Appendix 4.3: Major Accidents and Disasters Assessment for numbering)	MAD Scoping Group & Category	Risk Event (High Level)	Hazard Description	Hazard Sources and/or Pathways	Risk Description	Reasonable Worst Consequence if Event Did Occur	ES Topic (Volume 2 of this ES (Application Document Reference: TR010041/APP/6.2))
24	Technological or Manmade Hazards: Industrial and Urban Accidents	Major road traffic accident and large-scale gas release	Modified existing gas pipeline beneath A1.	Modified pipeline shifting or collapsing.	Destabilisation of A1 leading to collapse and potential gas explosion due to vehicles igniting released gas.	Death and / or injury to road users.	Population and Human Health

Part B

- 4.2.44. An assessment of major accidents and disasters has been carried out for Part B and is provided in **Appendix 4.3: Major Accidents and Disasters Assessment** of this ES. The assessment has considered the three sections of Part B as described in **Chapter 2: The Scheme** of this ES and shown on **Figure 1.2: Location Plan: Part B** of this ES. The three sections of Part B are:
- a. Part B Main Scheme Area (the area within the Order Limits of Part B between Alnwick and North Charlton including Charlton Mires Site Compound).
 - b. Lionheart Enterprise Park Compound located to the south of Alnwick.
 - c. Main Compound located west of Thirston New Houses and would be shared for Part A and Part B.
- 4.2.45. Ten major events during construction and seven major events during operation, to which Part B may be vulnerable, were identified and these are detailed in **Table 4-3** and **Table 4-4** below. Based on the assumptions and mitigation measures as detailed in **Appendix 4.3: Major Accidents and Disasters Assessment** of this ES, it is considered that each of these events would be managed to be ALARP.

Table 4-3 – Potential Major Risk Events – Construction Phase: Part B

Risk Record Entry Number (refer to Appendix 4.3: Major Accidents and Disasters Assessment for numbering)	MAD Scoping Group and Category	Risk Event (High Level)	Hazard Description	Hazard Sources and/or Pathways	Risk Description	Reasonable Worst Consequence if Event Did Occur	ES Topic (Volume 3 of this ES (Application Document Reference: TR010041/APP/6.3))
1	Natural Hazards: Hydrology	Extreme weather (flood)	Pluvial flooding	Heavy precipitation on Part B which the drainage network cannot cope with due to blockage, channel roughness, downstream water and exceedance events.	A review of the Environment Agency Flood Risk from Surface Water map indicates that sections of Part B are at high, medium and low risk of flooding from surface water sources. The Highways Agency Drainage Data Management System (HADDMS) online database indicates that the Alnwick to Ellingham section of the existing A1 has two documented surface water flood events. These are not classified as severe flood events and have a severity index of less than one.	Death or injury to multiple road users	Road Drainage and the Water Environment
8	Technological or Manmade Hazards: Industrial and Urban Accidents	Harm to people	Earthworks and construction activities (e.g. overturning of crane or dropped load) adjacent to operational areas of the existing structures.	Construction activities adjacent to existing structures and live roads.	Damage to highway infrastructure leading to death or injury of workers and road users.	Collapse or impact leads to harm to construction and other workers and road users in the vicinity.	Population and Human Health
16	Technological or Manmade Hazards: Industrial and Urban Accidents	Major road traffic accident	Ground subsidence leading to damage of roadway or associated infrastructure.	Collapse of carriageway (Rock South Farm Access Road)	Several parts of Part B lie within the Coal Authority Mining Reporting Area with specific sections classified as Development High Risk Areas (DHRA). Most of the DHRAs are within the 250 m buffer of the Order Limits of Part B. However, there are two DHRAs located where construction works would be taking place: Heckley Fence DHRA and the Rock Midstead DHRA. Note: The Rock Midstead DHRA traverses the Rock South Farm Access Road which is proposed to be upgraded via widening to the western edge of the existing track.	Death or injury to multiple road users.	Geology and Soils

Risk Record Entry Number (refer to Appendix 4.3: Major Accidents and Disasters Assessment for numbering)	MAD Scoping Group and Category	Risk Event (High Level)	Hazard Description	Hazard Sources and/or Pathways	Risk Description	Reasonable Worst Consequence if Event Did Occur	ES Topic (Volume 3 of this ES (Application Document Reference: TR010041/APP/6.3))
17	Technological or Manmade Hazards: Industrial and Urban Accidents	Fire or explosion or release of harmful gas	Presence of underground intermediate pressure gas pipeline	Release of flammable gas from pipeline	<ul style="list-style-type: none"> - It is proposed to divert 2025 m of intermediate pressure gas main on the west of the A1 from Ch58+200 m to Ch58+600 m and Ch58+800 m and Ch60+300 m. - Striking of underground services or utilities - when undertaking gas diversion works or from adjacent construction work on the road. - Loss of containment during works on the gas pipeline e.g. when connecting the new system to the existing system. 	Fire and/or explosion affects neighbouring property or members of the public.	Population and Human Health Geology and Soils
18	Technological or Manmade Hazards: Industrial and Urban Accidents	Fire or explosion or release of harmful gas	Presence of underground intermediate pressure gas pipeline	Release of flammable gas from pipeline	Ground subsidence leading to loss of containment.	Fire and/or explosion affects neighbouring properties or those people in the immediate area.	Population and Human Health Geology and Soils
21	Technological or Manmade Hazards: Industrial and Urban Accidents	Major road traffic accident	Ground subsidence leading to damage of roadway or associated infrastructure.	Collapse of overhead structure onto carriageway. Collapse of carriageway.	Several parts of Part B lie within the Coal Authority Mining Reporting Area with specific sections classified as DHRA. Most of the DHRA's are within the 250 m buffer of the Order Limits of Part B. There are two DHRAs located where construction works would be taking place: Heckley Fence DHRA and the Rock Midstead DHRA.	Death or injury to multiple road users.	Geology and soils
22	Technological or Manmade Hazards: Industrial and Urban Accidents	Major Road Traffic Accident Collapse or	Transportation of bridge components Phased construction of bridge in immediate	Road users on the existing A1 Falling objects cause road traffic accident	Injury to third parties. Debris falling on public highway resulting in accident. Damage to third party utilities or services located on or near bridge	Death or injury to members of the public, construction workers and the Applicant's personnel	Population and Human Health

Risk Record Entry Number (refer to Appendix 4.3: Major Accidents and Disasters Assessment for numbering)	MAD Scoping Group and Category	Risk Event (High Level)	Hazard Description	Hazard Sources and/or Pathways	Risk Description	Reasonable Worst Consequence if Event Did Occur	ES Topic (Volume 3 of this ES (Application Document Reference: TR010041/APP/6.3))
		damage to structure	proximity of operational public highway				
24	Natural Hazards: Hydrology	Extreme weather (flood)	Fluvial flooding	The River Aln, Denwick Burn, Kittycarter Burn, White House Burn and Shipperton Burn. Inadequate attenuation.	Part B includes a small section located in close proximity to the medium risk Flood Zone 2 and the high-risk Flood Zone 3; the identified fluvial flood risk is located along Denwick Burn and is associated with the River Aln. Consultation has also highlighted an existing flooding issue regarding fluvial flooding from the tributaries of Kittycarter Burn. Hydraulic modelling has shown existing flood risk extents within Part B associated with White House Burn, Kittycarter Burn and Shipperton Burn.	Death or injury to multiple road users	Road Drainage and the Water Environment
25	Technological or Manmade Hazards: Industrial and Urban Accidents	Major Road Traffic Accident Collapse or damage to structure	Transportation of bridge components Phased construction of bridge in immediate proximity of operational public highway	Road users on the existing A1 Falling objects cause road traffic accident	Injury to third parties. Debris falling on public highway resulting in accident. Damage to third party utilities or services located on or near bridge	Death or injury to members of the public, construction workers and the Applicant's personnel	Population and Human Health

Table 4-4 – Potential Major Risk Events – Operation and / or Maintenance Phases: Part B

Risk Record Entry Number (refer to Appendix 4.3: Major Accidents and Disasters Assessment for numbering)	MAD Scoping Group & Category	Risk Event (High Level)	Hazard Description	Hazard Sources and/or Pathways	Risk Description	Reasonable Worst Consequence if Event Did Occur	ES Topic (Volume 3 of this ES (Application Document Reference: TR010041/APP/6.3))
1	Natural Hazards: Hydrology	Extreme weather (flood)	Pluvial flooding	Heavy precipitation on Part B which the drainage network cannot cope with due to blockage, channel roughness, downstream water and exceedance events.	A review of the Environment Agency Flood Risk from Surface Water map indicates that sections of Part B are at high, medium and low risk of flooding from surface water sources. The HADDMS online database indicates that the Alnwick to Ellingham section of the existing A1 has two documented surface water flood events. These are not classified as severe flood events and have a severity index of less than one.	Death or injury to multiple road users	Road Drainage and the Water Environment
16	Technological or Manmade Hazards: Industrial and Urban Accidents	Major road traffic accident	Ground subsidence leading to damage of roadway or associated infrastructure.	Collapse of carriageway (Rock South Farm Access Road)	Several sections of Part B lie within the Coal Authority Mining Reporting Area with specific sections classified as DHRA. Most of the DHRA's are within the 250 m buffer of the Order Limits of Part B. However, there are two DHRAs located where construction works would be taking place: Heckley Fence DHRA and the Rock Midstead DHRA. Note: The Rock Midstead DHRA traverses the Rock South Farm Access Road which is proposed to be upgraded via widening to the western edge of the existing track.	Death or injury to multiple road users.	Geology and Soils
18	Technological or Manmade Hazards: Industrial and Urban Accidents	Fire or explosion or release of harmful gas	Presence of underground intermediate pressure gas pipeline	Release of flammable gas from pipeline	Ground subsidence leading to loss of containment.	Fire or explosion affects neighbouring properties or those people in the immediate area.	Geology and Soils

Risk Record Entry Number (refer to Appendix 4.3: Major Accidents and Disasters Assessment for numbering)	MAD Scoping Group & Category	Risk Event (High Level)	Hazard Description	Hazard Sources and/or Pathways	Risk Description	Reasonable Worst Consequence if Event Did Occur	ES Topic (Volume 3 of this ES (Application Document Reference: TR010041/APP/6.3))
21	Technological or Manmade Hazards: Industrial and Urban Accidents	Major road traffic accident	Ground subsidence leading to damage of roadway or associated infrastructure.	Collapse of overhead structure onto carriageway. Collapse of carriageway.	Several sections of Part B lie within the Coal Authority Mining Reporting Area with specific sections classified as DHRA. Most of the DHRAs are within the 250 m buffer of the Order Limits of Part B. There are two DHRAs located where construction works would be taking place: Heckley Fence DHRA and the Rock Midstead DHRA.	Death or injury to multiple road users.	Geology and Soils
23 (Heckley Fence); and 26 (Charlton Mires)	Technological or Manmade Hazards: Transport accidents	Harm to people	Vehicle falling from new bridge.	Road users on the existing and new A1	Vehicle falling from new bridge onto existing A1 road users below.	Death or injury to multiple road users.	Population and Human Health
24	Natural Hazards: Hydrology	Extreme weather (flood)	Fluvial flooding	The River Aln, Denwick Burn, Kittycarter Burn, White House Burn and Shipperton Burn. Inadequate attenuation.	Part B includes a small section located in close proximity to the medium risk Flood Zone 2 and the high-risk Flood Zone 3; the identified fluvial flood risk is located along Denwick Burn and is associated with the River Aln. Consultation has also highlighted an existing flooding issue regarding fluvial flooding from the tributaries of Kittycarter Burn. Hydraulic modelling has shown existing flood risk extents within Part B associated with White House Burn, Kittycarter Burn and Shipperton Burn.	Part A had identified flooding affecting neighbouring property Death or injury to multiple road users	Road Drainage and the Water Environment

Transboundary Effects

- 4.2.46. Paragraph 5 of Schedule 4 to the EIA Regulations (**Ref. 4.2**) requires a description of the likely significant transboundary effects be provided in the ES.
- 4.2.47. The Inspectorate has undertaken a Transboundary Screening as part of the **Scoping Opinion (Application Document Reference: TR010041/APP/6.12)** for Part A and the **Scoping Opinion (Application Document Reference: TR010041/APP/6.13)** for Part B to determine whether Part A and Part B would result in significant transboundary effects on any European Economic Area (EEA) States. The Inspectorate concluded that Part A and Part B were unlikely to have a significant effect, either alone or cumulatively, on the environment in another EEA State.
- 4.2.48. The Transboundary Screening for Part A is provided within **Appendix 4.4: Regulation 32 Transboundary Screening** of this ES.
- 4.2.49. The Transboundary Screening for Part B also provided within **Appendix 4.4: Regulation 32 Transboundary Screening** of this ES.

4.3. SURVEYS AND PREDICTIVE TECHNIQUES AND METHODS

ASSESSMENT METHODOLOGY

- 4.3.1. Data collection has been undertaken for each assessment topic, the details of which are presented in each of the **Technical Chapters 5 to 15** of **Volume 2** of this ES (**Application Document Reference: TR010041/APP/6.2**) for Part A and of **Volume 3** of this ES (**Application Document Reference: TR010041/APP/6.3**) for Part B and are briefly summarised in **Table 4-5** below. Guidance and publications referred to below are referenced within each respective chapter.

Table 4-5 - Data Collection, Surveys and Predictive Methods

Technical Topic	Data Collection, Surveys and Predictive Methods
Chapter 5 - Air Quality	<p>Baseline air quality has been assessed with reference to local air quality management reporting, nitrogen dioxide diffusion monitoring, national modelling undertaken by the Department for Environment, Food and Rural Affairs (Defra) and nitrogen deposition and nitrogen oxides modelling from Air Pollution Information Systems.</p> <p>A detailed level assessment has been undertaken following:</p> <ul style="list-style-type: none"> - DMRB Volume 11, Section 3, Part 1: HA207/07 - IAN 170/12 - Updated air quality advice on the assessment of future NO_x and NO₂ projections for users of DMRB Volume 11, Section 3, Part 1 Air Quality - IAN174/13 - Updated advice for evaluating significant local air quality effects for users of DMRB Volume 11, Section 3, Part 1 Air Quality (HA207/07) - IAN 175/13 - Updated air quality advice on risk assessment related to compliance with the EU Directive on ambient air quality and on the production of Scheme Air Quality Action Plans for user of DMRB Volume 11, Section 3, Part 1 Air Quality - IAN 185/15 - Updated traffic, air quality and noise advice on the assessment of link speeds and generation of vehicle data into 'speed-bands' for users of DMRB Volume 11, Section 3, Part 1 Air Quality and Volume 11, Section 3. Part 7 Noise.
Chapter 6 – Noise and Vibration	<p>A baseline noise survey has been undertaken at locations close to the A1. A detailed assessment has been undertaken in accordance with guidance contained within DMRB Volume 11, Part 7 (HD 213/11) – Noise and Vibration and Calculation of Road Traffic Noise (CRTN) technical memorandum. Consultation with NCC was undertaken to discuss and agree the assessment scope including that associated with the baseline noise survey.</p> <p>Data sources have included OS Mastermap data, OS Terrain 5 data, review of GIS databases, online mapping and street scene photography, interrogation of AddressBase Plus data, use of site topography survey, review and use of 3D Scheme drawings, construction phase information, provided traffic data, construction and vibration noise level predictions (in accordance with BS5228:1 and BS5228:2), operational road traffic noise level predictions (in accordance with CRTN and DMRB HD 213/11) and road surface information using the Applicant's software Highways Agency Pavement Management System (HAPMS), and Defra Noise Important Areas (NIAs).</p>
Chapter 7 - Landscape and Visual	<p>Winter and summer surveys have been undertaken for the landscape and visual assessment.</p> <p>A detailed assessment of landscape and visual effects has been undertaken in accordance with DMRB Volume 11, Section 3, Part 5, IAN 135/10 – Landscape and Visual Effects Assessment and the Guidelines for Landscape and Visual Impact Assessment (GLVIA).</p> <p>Accompanying photography has been undertaken following best practice guidance from the Landscape Institute's Technical Guidance Note 02/17 Visual Representation of Development Proposals and the Landscape Institute Advice Note 1/11 Advice on Photography and Photomontage.</p> <p>Desktop Study included the review of the Northumberland Consolidated Planning Policy Framework and saved policy documents from the previous authorities, Alnwick Landscape Character Assessment Supplementary Planning Document (SPD), Alnwick District Wide Local Plan, Alnwick District Local Development Framework (LDF) Core Strategy, Berwick-Upon-Tweed Local Plan, Castle Morpeth District Local Plan, National Character Areas and Northumberland Landscape Character Assessment; Part A Landscape Classification, Magic Website, Google Earth, Bing Maps (including online copies of Ordnance Survey mapping from Bing and Northumberland's PRow Mapping, available at http://map.northumberland.gov.uk/prow/).</p> <p>The viewpoint locations, methodology and receptors were circulated and agreed following consultation with Historic England (for Part B), NCC, Natural England and Northumberland National Park.</p>
Chapter 8 - Cultural Heritage	<p>Data collection for the setting assessment follows Historic England guidance.</p> <p>A detailed desk-based assessment has been carried out in compliance with Chartered Institute for Archaeologists (CIfA) Standard and Guidance for Historic Environment Desk-based Assessment, CIfA code of conduct, Historic England guidance and DMRB Volume 11 Section 3 Part 2 Cultural Heritage.</p>

Technical Topic	Data Collection, Surveys and Predictive Methods
	<p>Site visits were undertaken to assess the potential for impacts on heritage assets within the Order Limits, assess potential impacts on the setting of assets in wider landscape, and to identify any unknown heritage assets. The site visit for Part A was undertaken in May 2018. The site visits for Part B were undertaken on the following dates: 29 of November 2018; 3 and 5 of April 2019; and 19 June 2019.</p> <p>Geophysical surveys were undertaken in accordance with guidelines provided by Historic England, ClfA and the Archaeology Data Service. The archaeological assessment of LiDAR data was also undertaken and mapped in accordance with guidance developed by Historic England.</p> <p>For Part, trial trenching has been undertaken to further investigate two areas identified containing anomalies of potential archaeological origin within Part B. No heritage assets were identified during the trial trenching.</p>
Chapter 9 - Biodiversity	<p>The biodiversity assessment has been undertaken using the approach detailed in the Chartered Institute of Ecology and Environmental Management (CIEEM) Guidelines for Ecological Impact Assessment, DMRB Volume 11, Section 3 Part 4 – Ecology and Nature Conservation and IAN 130/10 - Ecology and Nature Conservation: Criteria for Impact Assessment.</p> <p>Baseline data has been accrued in line with best practice guidelines and methods as prescribed by CIEEM – Guidelines for Preliminary Ecology Appraisal (2017), Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine (2019), as well as DMRB Volume 11, Section 3 Part 4 and IAN 130/10.</p> <p>Data sources have included publicly available resources and historic records and included requests to appropriate stakeholders for records not publicly accessible to inform this assessment, including the Environmental Records Information Centre (ERIC) North East and specialist species groups.</p> <p>Specific surveys for both species and habitats have been undertaken in line with best practice survey guidelines for each specific receptor (refer to Chapter 9: Biodiversity, Volume 2 of this ES (Application Document Reference: TR010041/APP/6.2) for Part A and Chapter 9: Biodiversity, Volume 3 of this ES (Application Document Reference: TR010041/APP/6.3) for Part B and supporting appendices for a comprehensive breakdown of relevant receptor guidelines and methodologies). Professional experience and knowledge have been applied during certain surveys, with any deviations from standard survey guidance explicitly stated.</p> <p>In the absence of conclusive survey data (e.g. as a result of limitations to survey effort, or inconclusive survey results) a precautionary approach has been applied. The precautionary approach assumes presence of a receptor in the absence of conclusive results or evidence. The precautionary approach requires consideration of impacts, necessary mitigation, and residual impacts as if a given receptor is present and would be impacted.</p>
Chapter 10 - Road Drainage and the Water Environment	<p>A detailed assessment has been undertaken in accordance with DMRB. This includes a simple level assessment of the potential impact of routine runoff on the chemical quality of receiving surface waters (method A and D Highways Agency Water Risk Assessment Tool (HAWRAT) assessments) in accordance with DMRB Volume 11 Section 2 Part 10 (HD 45/09) – Road Drainage and the Water Environment. The assessment has included a desk based assessment, supported by site visits, and included a review of Environment Agency Flood Maps and associated information, Environment Agency water quality data and existing drainage data on the HADDMS. CulvertMaster, Hydraulic Modelling and geomorphological assessments (for Part A) have been used as part of the detailed assessment, as informed by topographic data.</p>
Chapter 11 - Geology and Soils	<p>A detailed assessment has been undertaken in accordance with DMRB Volume 11, Section 3 Part 11 – Geology and Soils and in consultation with NCC, including Agricultural Land Classification (ALC) survey, Coal Mining Risk Assessment, and ground investigation (GI) works. A review has been undertaken of baseline soil, geological and environmental information, including historical mapping.</p>
Chapter 12 - Population and Human Health	<p>A simple level of assessment for Population and Human Health has been undertaken following DMRB Volume 11, Section 3 Part 6 – Land use, Part 8 – Pedestrians, cyclists, equestrians and community effects and Part 9 – Vehicle travellers and IAN 125/15 – Environmental assessment update. Data has been collected from the Office for National Statistics (ONS), Local Authority Labour Market Profiles, publicly available GIS and mapping information, Local Authority policies and reports and Public Health England data. An assessment of farm viability has also been undertaken.</p>
Chapter 13 - Material Resources	<p>A detailed assessment of material resources has been undertaken in accordance with IAN153/11 – Guidance on the environmental assessment of material resources.</p>

Technical Topic	Data Collection, Surveys and Predictive Methods
	<p>Material resource and waste data has been collated from third-party sources to establish the baseline scenarios. Assessments have been undertaken through a desk-based study.</p>
Chapter 14 - Climate	<p>An assessment has been undertaken for the potential effects on climate (from Greenhouse Gas (GHG) emissions) using available data and information on the scale of GHG emitting activities for the baseline scenario and for the Scheme. Calculation of the GHG emissions has used a standard emissions calculation methodology applying a suitable emissions factor. Total operational GHG emissions have been modelled using traffic data for Part A and emissions were quantified using WebTAG data tables (Ref. 4.6) and data from the Department of Transport (Ref. 4.7).</p> <p>An assessment has been undertaken on the vulnerability of the Scheme to projected changes in climate (and impacts relevant to adaptation). Historical (baseline) local climate data from the Met Office and future UK climate projections (UKCP18) has been used to identify anticipated changes in climate conditions with the potential to affect the Scheme during both construction and operation.</p>

Updated DMRB Guidance

- 4.3.2. As explained in **paragraph 4.1.3** above, some DMRB guidance documents were updated in 2019 and 2020 (and associated IANs replaced), by which time the EIA for the Scheme was largely complete. In order to determine the implications of these updates to the conclusions of the ES, a sensitivity test has been undertaken with the following aims:
- a.** To identify key changes in the assessment methodology, comparing the old and new versions of the guidance against the EIA for the Scheme.
 - b.** To determine whether there would be changes to the significant effects reported in this ES if the updated guidance had been used for the assessment.
- 4.3.3. The findings of the sensitivity test are presented in **Appendix 4.5: DMRB Sensitivity Test** of this ES. For some environmental topics, further assessment has been required in order to fully determine the implications. Refer to **Technical Chapters 5 to 15, Volume 2** of this ES (**Application Document Reference: TR010041/APP/6.2**) for Part A and of **Volume 3** of this ES (**Application Document Reference: TR010041/APP/6.3**) for Part B, for further details of the approach to the sensitivity tests and the implications to the conclusions of the assessment.
- 4.3.4. The DMRB Volume 11 Section 2 Part 5 (**Ref. 4.8**), as referred to in **paragraph 4.5.1** below, together with IAN 125/15 (**Ref. 4.4**), has been superseded by DMRB LA 104 Environmental Assessment and Monitoring (**Ref. 4.9**). The updated guidance requires consideration of environmental factors set out in the EIA Directive 2014/52/EU (**Ref. 4.10**), together with the consideration of heat and radiation and major accidents and disasters. As the ES has been prepared in line with the EIA Regulations (**Ref. 4.2**), the assessment is therefore compliant with LA 104 (**Ref. 4.9**).
- 4.3.5. The assessment focuses on determining changes to significant effects and therefore does not necessarily report changes in non-significant effects. Therefore, where the DMRB sensitivity test has identified new significant effects and, where relevant, associated mitigation measures, these have been taken forward, where relevant, into **Chapter 15: Assessment of Combined Effects, Volume 2** of this ES (**Application Document Reference: TR010041/APP/6.2**) for Part A, **Chapter 15: Assessment of Combined Effects, Volume 3** of this ES (**Application Document Reference: TR010041/APP/6.3**) for Part B, **Chapter 16: Assessment of Cumulative Effects, Volume 4** of this ES (**Application Document Reference: TR010041/APP/6.4**), **Chapter 17: Summary, Volume 4** of this ES (**Application Document Reference: TR010041/APP/6.4**) and the **Outline Construction Environmental Management Plan (Outline CEMP)** (**Application Document Reference: TR010041/APP/7.3**).
- #### Assessment of Cumulative Effects
- 4.3.6. The assessment of cumulative effects for Part A and Part B is documented in **Chapter 15: Assessment of Combined Effects, Volume 2** of this ES (**Application Document Reference: TR010041/APP/6.2**) for Part A and **Volume 3** of this ES (**Application**

Document Reference: TR010041/APP/6.3) for Part B. These assessments comprise the following elements:

- a. Combined effects** (due to impacts from different environmental topics associated with the Scheme which combine to cause multiple effects on a single receptor) as a result of Part A.
- b. Combined effects** as a result of Part B.

4.3.7. The assessment of cumulative effects for the Scheme as a whole is documented within **Chapter 16: Assessment of Cumulative Effects, Volume 4** of this ES (**Application Document Reference: TR010041/APP/6.4**). This assessment comprises the following elements:

- a. Combined effects:**
 - i. Within environmental topic**, which comprises combined effects taken from each separate environmental topic for Part A and Part B combined (for example landscape character or where additional assessment is required for the Scheme e.g. Climate).
 - ii. Cross environmental topic**, which comprises combined effects from all relevant environmental topics for Part A and Part B combined.
- b. Cumulative effects** (due to the impacts of the Scheme interacting with the impacts from other proposed developments in the vicinity of a receptor). This has been based on 5 km reduced to 2 km (to align with the landscape Zone of Theoretical Visibility (ZTV)) from the Order Limits and 200 m from the Affected Road Network (ARN) outside of the 2 km.

STUDY AREAS

4.3.8. Study Areas have been defined individually for each environmental topic, taking account of guidance published in DMRB, the geographic scope of the potential impacts relevant to that topic or of the information required to assess those impacts. The Study Areas were agreed with relevant stakeholders and NCC where required, as evidenced in **Appendix 4.2: Environmental Consultation** of this ES. The Study Areas are described within each of the **Technical Chapters 5 to 15, Volume 2** of this ES (**Application Document Reference: TR010041/APP/6.2**) for Part A and **Volume 3** of this ES (**Application Document Reference: TR010041/APP/6.3**) for Part B.

BASELINE CONDITIONS

- 4.3.9. In order to identify the effects of the Scheme on the environment, it is important to understand the existing environment (i.e. baseline conditions) that would be affected and the changes that would occur to the baseline.
- 4.3.10. It is also necessary to predict the future baseline conditions, which in most cases is the Do-Minimum (DM) scenario in the design year (2038), which considers the baseline conditions in the future year if the Scheme was not built. The future year is defined separately for each technical topic if it differs to the design year. It takes account of any other predicted changes

for example predicted growth in traffic. Refer to **Chapter 2: The Scheme** of this ES for further details.

- 4.3.11. As part of this step, sensitive receptors are identified. Sensitive receptors may be a physical resource or asset (e.g. a water body or a residence) or a user group (e.g. recreational users of an area or local residents).

DESIGN, MITIGATION AND ENHANCEMENT MEASURES

- 4.3.12. Where significant adverse environmental effects are identified, mitigation measures are required to remove, reduce or offset the impacts or reduce their significance. Measures to mitigate the effects of the Scheme have been identified and included within the **Technical Chapters 5 to 15** of **Volume 2** of this ES (**Application Document Reference: TR010041/APP/6.2**) for Part A and of **Volume 3** of this ES (**Application Document Reference: TR010041/APP/6.3**) for Part B. Mitigation measures have also been included in the Register of Environmental Actions and Commitments (REAC) which forms part of the **Outline CEMP (Application Document Reference: TR010041/APP/7.3)** for the Scheme. The Outline CEMP supports the implementation of mitigation and good construction practices. It is a combined Outline CEMP to ensure that all construction and operation design, mitigation and monitoring measures are taken forward to detailed design.
- 4.3.13. Mitigation of potentially significant adverse environmental effects follows the hierarchy below:
- a. Avoidance** – measures incorporated into the design to avoid an impact, such as changes to the horizontal or vertical alignment of the Scheme or alterations to junction and other structure location and design or modifying the Scheme programme to avoid environmentally sensitive periods. This type of measure is known as embedded mitigation.
 - b. Reduction** – incorporate measures to reduce an impact, such as landscape planting around a junction to limit views or limiting working hours to reduce nuisance impacts to nearby residents.
 - c. Compensation/Remediation** – where it is not possible to avoid or reduce a significant effect then offsetting measures will be considered, for example the provision of replacement habitat to replace that lost to the Scheme or remediation of contaminated soils.
 - d. Enhancement** – where possible the Scheme includes environmental enhancement measures. Such measures are those over and above any avoidance, mitigation and compensation measures required to neutralise the impacts of the Scheme. Where possible, enhancement measures have been identified within each **Technical Chapters 5 to 15** of **Volume 2** of this ES (**Application Document Reference: TR010041/APP/6.2**) for Part A and **Volume 3** of this ES (**Application Document Reference: TR010041/APP/6.3**) for Part B. Further environmental enhancements may be provided as part of the detailed design where practicable.
- 4.3.14. Each of the **Technical Chapters 5 to 15, Volume 2** of this ES (**Application Document Reference: TR010041/APP/6.2**) for Part A and **Volume 3** of this ES (**Application Document Reference: TR010041/APP/6.3**) for Part B includes a section on the measures

proposed to mitigate potential significant adverse effects of the Scheme, together with any enhancement measures.

Securing and Implementing Mitigation

- 4.3.15. To ensure the proposed mitigation measures are delivered, they will be secured by way of requirements included in Schedule 2 of the **draft DCO (Application Document Reference: TR010041/APP/3.1)**, including that the construction of the Scheme is undertaken in accordance with mitigation measures identified in the ES and written into the **Outline CEMP (Application Document Reference: TR010041/APP/7.3)**.
- 4.3.16. The proposed DCO will place a legal responsibility on the Applicant to comply with the requirements contained within Schedule 2 of the DCO. Discharge of these requirements is expected to be approved by the Secretary of State, following consultation with the relevant planning or statutory environmental authority (such as Natural England). These requirements refer expressly to the **Outline CEMP (Application Document Reference: TR010041/APP/7.3)**.

Monitoring

- 4.3.17. In accordance with Paragraph 7 of Schedule 4 of the EIA Regulations (**Ref. 4.2**), any monitoring needed to monitor any significant adverse effects or confirm that the mitigation measures put in place are working as intended are reported within the mitigation section of each of the **Technical Chapters 5 to 15 of Volume 2** of this ES (**Application Document Reference: TR010041/APP/6.2**) for Part A and of **Volume 3** of this ES (**Application Document Reference: TR010041/APP/6.3**) for Part B.
- 4.3.18. Also, in accordance with the EIA Regulations monitoring may sometimes be required to confirm that no environmental effect is taking place, particularly if there has been any uncertainty or difficulties in assessing effects. As detailed in Regulation 3 of the EIA Regulations (**Ref. 4.2**), a monitoring measure means a provision requiring the monitoring of any significant adverse effects on the environment of proposed development. Any such monitoring is reported in the **Technical Chapters 5 to 15 of Volume 2** of this ES (**Application Document Reference: TR010041/APP/6.2**) for Part A and of **Volume 3** of this ES (**Application Document Reference: TR010041/APP/6.3**) for Part B.

ASSESSMENT OF SHARED USE MAIN COMPOUND

- 4.3.19. As set out in **Chapter 1: Introduction** of this ES, Part A and Part B were originally proposed to be the subject of separate DCO applications but have now been combined into a single application for the Scheme. At the time that the detailed assessment of Part A was undertaken, only the use and construction of the Main Compound by activities identified within Part A was assessed. Similarly, at the time that the detailed assessment of Part B was undertaken, only the effects of using the Main Compound relevant to Part B were assessed. Therefore, the effects of the use of the Main Compound for Part A were to be presented in the ES for Part A and the effects for Part B in the ES for Part B, with the cumulative effects of both schemes being presented in Part B.

- 4.3.20. In this ES, the assessment of effects for Part A as a result of the Main Compound are reported in **Technical Chapters 5 to 15, Volume 2** of this ES (**Application Document Reference: TR010041/APP/6.2**). Where the Main Compound would be used to support the construction of Part B, the assessment of effects as a result of this additional use of the Main Compound for Part B is reported in **Technical Chapters 5 to 15, Volume 3** of this ES (**Application Document Reference: TR010041/APP/6.3**).
- 4.3.21. Cumulative effects are reported, where relevant, in **Chapter 15: Assessment of Combined Effects, Volume 2** of this ES for Part A (**Application Document Reference: TR010041/APP/6.2**), **Chapter 15: Assessment of Combined Effects, Volume 3** of this ES for Part B (**Application Document Reference: TR010041/APP/6.3**), and **Chapter 16: Assessment of Cumulative Effects, Volume 4** of this ES (**Application Document Reference: TR010041/APP/6.4**) for the Scheme as a whole.
- 4.3.22. The process that has been completed is as follows:
- a. Confirmation of the additional activities at the Main Compound for Part B was provided by the Buildability Advisor. An assessment was made as to whether the additional activities relevant to Part B, as set out in **Section 2.8 of Chapter 2: Scheme** of this ES, would have any additional potential effects on receptors.
 - b. If it was considered that the additional activities would not be likely to give rise to any additional effects, the issue is scoped out of the assessment for Part B in the potential impacts section of the relevant Part B **Technical Chapter 5 to 15, Volume 3** of this ES (**Application Document Reference: TR010041/APP/6.3**).
 - c. Where the potential for additional effects was identified due to the use of the Main Compound for Part B, the additional effect is set out within the relevant Part B **Technical Chapter 5 to 15, Volume 3** of this ES (**Application Document Reference: TR010041/APP/6.3**), with a clear statement that these effects are additional to those described within Part A of the ES.
- 4.3.23. The combined effects (the effects from the Scheme as a whole) resulting from use of the Main Compound are then considered in **Chapter 16: Assessment of Cumulative Effects, Volume 4** of this ES (**Application Document Reference: TR010041/APP/6.4**).
- 4.3.24. In the assessments reported in relation to Part B in this ES, the relevant Part B **Technical Chapter 5 to 15, Volume 3** of this ES (**Application Document Reference: TR010041/APP/6.3**) provide baseline information in respect of the Main Compound where relevant to the Part B assessment described above. Similarly, as appropriate, the additional use of the Main Compound pertaining to Part B is identified. This is then considered in relation to the scoping of the relevant Part B **Technical Chapter 5 to 15, Volume 3** of this ES (**Application Document Reference: TR010041/APP/6.3**).
- 4.3.25. The **Scoping Report (Application Document Reference: TR010041/APP/6.11)** for Part B sets out how the Main Compound would be assessed for Part B, when Part A and Part B were to be the subject of separate DCO applications. The approach set out above is considered sufficient for the assessment of the potential impacts of the Main Compound on sensitive receptors for the Scheme and is compliant with the **Scoping Report** for Part B.

4.3.26. A summary of the outcomes of the assessment detailed in **paragraph 4.3.19** is set out in **Table 4-6** below. As the Main Compound would only be in use temporarily during the construction of the Scheme, **Table 4-6** summarises the assessment and outcomes for the Main Compound within Part B for the construction phase only.

Table 4-6 - Summary of Assessment for Main Compound within Part B

Technical Topic	Summary of Assessment and Outcome
Air Quality	<p>A review of the construction traffic determined that potential construction traffic impacts on air pollutants could be screened out of the assessment as the predicted construction traffic flows fell well below the DMRB HA 207/07 scoping criteria.</p> <p>DMRB HA 207/07 does not provide guidance on impact magnitude for construction dust impacts. The assessment has assumed that where sensitive receptors are present within 200 m of construction works, any potential impacts would risk causing a significant effect in terms of loss of amenity and require mitigation that is set out in the Outline CEMP (Application Document Reference: TR010041/APP/7.3).</p> <p>No further assessment was therefore required.</p>
Noise and Vibration	<p>The assessment identified additional potential impacts to local receptors from noise from traffic movements through the additional use of the Main Compound as a result of Part B, prior to mitigation. However, as detailed in Section 6.8 of Chapter 6: Noise and Vibration, Volume 3 of this ES (Application Document Reference: TR010041/APP/6.3), this additional impact in respect of the use of the Main Compound by Part B is not considered to be significant.</p>
Landscape and Visual	<p>The assessment determined there would be negligible impacts on landscape and visual receptors through the additional use of the Main Compound as a result of Part B, prior to mitigation. However, as detailed in Section 7.8 of Chapter 7: Landscape and Visual, Volume 3 of this ES (Application Document Reference: TR010041/APP/6.3), these potential impacts are scoped out of further assessment.</p>
Cultural Heritage	<p>The assessment determined there would be no potential impacts on heritage assets through the additional use of the Main Compound as a result of Part B, prior to mitigation. As detailed in Section 8.8 of Chapter 8: Cultural Heritage, Volume 3 of this ES (Application Document Reference: TR010041/APP/6.3), these potential impacts are scoped out of further assessment.</p>
Biodiversity	<p>The assessment determined that there would be negligible impacts due to increase in personnel and vehicle presence and movement</p>

Technical Topic	Summary of Assessment and Outcome
	through the additional use of the Main Compound as a result of Part B, prior to mitigation. However, as detailed in Section 9.8 of Chapter 9: Biodiversity, Volume 3 of this ES (Application Document Reference: TR010041/APP/6.3), these potential impacts are scoped out of further assessment.
Road Drainage and the Water Environment	The assessment determined that there would be negligible impacts due to any increased risk of sedimentation or pollution to adjacent watercourses and the water environment through the additional use of the Main Compound as a result of Part B, prior to mitigation. However, as detailed in Section 10.8 of Chapter 10: Road Drainage and the Water Environment, Volume 3 of this ES (Application Document Reference: TR010041/APP/6.3), these potential impacts are scoped out of further assessment.
Geology and Soils	The assessment determined that there would be negligible impacts due to any additional activities through the additional use of the Main Compound as a result of Part B, prior to mitigation. However, as detailed in Section 11.8 of Chapter 11: Geology and Soils, Volume 3 of this ES (Application Document Reference: TR010041/APP/6.3), these potential impacts are scoped out of further assessment.
Population and Human Health	The assessment determined that there would be negligible impacts due to additional staff and additional traffic movements and increased noise and vibration levels through the additional use of the Main Compound as a result of Part B, prior to mitigation. However, as detailed in Section 12.8 of Chapter 12: Population and Human Health, Volume 3 of this ES (Application Document Reference: TR010041/APP/6.3), this additional impact is not considered to be significant.
Material Resources	Chapter 13: Material Resources, Volume 3 of this ES (Application Document Reference: TR010041/APP/6.3) assesses the likely significant effects as a result of the use of material and the generation of waste for Part B. The quantity of material required and waste generated by Part B is not dependant on construction compounds. The requirement to assess construction compound activity, including that relating to the Main Compound, is therefore beyond the scope of Chapter 13: Material Resources, Volume 3 of this ES (Application Document Reference: TR010041/APP/6.3) and therefore no further assessment was required.
Climate	Greenhouse Gases Chapter 14: Climate, Volume 3 of this ES (Application Document Reference: TR010041/APP/6.3) assesses the generation of

Technical Topic	Summary of Assessment and Outcome
	<p>Greenhouse Gas emissions during construction. Any additional emissions that would be generated through the vehicle movements between the Main Compound and Part B would be negligible when compared to other sources of Greenhouse Gases during construction. Therefore, the location of the Main Compound is not considered within Chapter 14: Climate, Volume 3 of this ES (Application Document Reference: TR010041/APP/6.3).</p> <p>Vulnerability of Part B to climate change</p> <p>The assessment of vulnerability of Part B to climate change determined that there would be negligible impacts due to any additional activities through the additional use of the Main Compound as a result of Part B, prior to mitigation. However, as detailed in Section 14.8 of Chapter 14: Climate, Volume 3 of this ES (Application Document Reference: TR010041/APP/6.3), this additional impact is not considered to be significant.</p>
Combined Effects	<p>Chapter 15: Assessment of Combined Effects, Volume 3 of this ES (Application Document Reference: TR010041/APP/6.3) provides an assessment of combined effects for Part B. No potential additional significant combined effects have been identified in respect of the use of the Main Compound by both Part A and Part B.</p>
Cumulative Effects as a result of the Scheme	<p>Chapter 16: Assessment of Cumulative Effects, Volume 4 of this ES (Application Document Reference: TR010041/APP/6.4) provides an assessment of combined and cumulative effects for the Scheme. No potential additional significant combined and cumulative effects have been identified in respect of the use of the Main Compound by both Part A and Part B.</p>

DIFFERENCES BETWEEN PART A AND PART B TECHNICAL CHAPTERS

- 4.3.27. As set out in **Chapter 1: Introduction** of this ES, Part A and Part B were originally proposed to be the subject of separate DCO applications but have now been combined into a single application for the Scheme. As the Part A **Technical Chapters 5 to 15, Volume 2** of this ES (**Application Document Reference: TR010041/APP/6.2**) and the Part B **Technical Chapters 5 to 15, Volume 3** of this ES (**Application Document Reference: TR010041/APP/6.3**) remain separate chapters of this ES, there are some differences between the technical chapters for Part A and Part B. **Table 4-7** identifies these differences and provides explanations.
- 4.3.28. It should be noted that **Table 4-7** only focuses upon technical differences relating predominantly to the assessment methodology. There are other differences between the assessments of Part A and Part B that result from the different approach to assessment for

the two parts of the Scheme that were identified at the scoping stage for the EIA. Each **Technical Chapters 5 to 15, Volume 2** of this ES (**Application Document Reference: TR010041/APP/6.2**) and **Technical Chapters 5 to 15, Volume 3** of this ES (**Application Document Reference: TR010041/APP/6.3**) presents a list of all key differences between Part A and Part B.

Table 4-7 - Differences between Technical Chapters for Part A and Part B

Technical Topic	Summary of Assessment and Outcome
Air Quality	There are no differences in the assessment methodology between Part A and Part B.
Noise and Vibration	<p>Construction noise and vibration assessment:</p> <p>Within Chapter 6: Noise and Vibration, Volume 2 of this ES (Application Document Reference: TR010041/APP/6.2) for Part A, there are considerably more noise sensitive receptors located within the Construction Noise Study Area than there are within the equivalent Study Area for Chapter 6: Noise and Vibration, Volume 3 of this ES (Application Document Reference: TR010041/APP/6.3) in relation to Part B.</p> <p>Given that it is not feasible (nor would it be proportionate) to obtain baseline noise measurements at sufficient locations to represent all receptors, receptor specific thresholds have not been defined for Part A. Single LOAEL and SOAEL thresholds applicable at all receptors have therefore been appropriately and cautiously derived based on noise measurements undertaken at a location positioned approximately 600 m from the A1, representing a precautionary approach for many receptors. These baseline noise levels are representative of the existing noise climate close to the offline section of Part A and therefore represent a robust basis for deriving LOAEL and SOAEL thresholds. Further to this, given the number of and geographic location of the noise sensitive receptors within the Part A Study Area, it was considered inappropriate to use representative receptors to undertake the Part A construction assessment, SOAEL zones (the area within which the SOAEL would be exceeded) have been predicted for each construction activity. These SOAEL zones have been used to determine where significant effects might occur as a result of the construction phase. Where properties are located within the SOAEL zone for any particular activity, specific mitigation measures as listed in Chapter 6: Noise and Vibration, Volume 2 of this ES (Application Document Reference: TR010041/APP/6.2) would be applicable.</p> <p>Part B has fewer noise sensitive receptors located within the Construction Noise Study Area. It is therefore appropriate to use the baseline noise measurement data, which adequately represent the full spread of noise sensitive receptors, to determine receptor specific construction noise LOAELs and SOAELs at a comprehensive selection of representative assessment locations. Given that LOAEL and SOAEL thresholds have been derived at representative noise sensitive receptors, which are spread throughout the Construction Noise Study Area, it is appropriate for the assessment to be undertaken at these receptor locations, which are also representative of other receptors within their vicinity.</p> <p>The construction noise assessments for Parts A and B are both based on the same recognised calculation methodologies. For corresponding construction calculations, all assumed plant items and operating times are the same for both Part A and B. Whilst, due to the different number of receptors in Part A and Part B, different assessment approaches have been adopted, both Part A and B appropriately assess the potential for significant effects to occur and a suitable and consistent approach to mitigation has been presented. The differences in assessment approach are therefore not material to the outcome of the assessments.</p>
Landscape and Visual	<p>Use of viewpoints for assessment:</p> <p>A different approach has been used with the use of viewpoints for assessments for Part A and Part B, to reflect the nature of the receptors in the different Study Areas (fewer receptors for Part B and within a more enclosed online corridor). In Chapter 7: Landscape and Visual, Volume 2 of this ES (Application Document Reference: TR010041/APP/6.2) for Part A, assessment was undertaken for every receptor and viewpoint. In Chapter 7: Landscape and Visual, Volume 3 of this ES (Application Document Reference: TR010041/APP/6.3) for Part B, assessment was undertaken for receptors only.</p> <p>These assessments are directly comparable in terms of assessment approach as the users / occupiers of all sensitive visual receptors have been assessed to an appropriately detailed level for both Part A and Part B, but with some broader additional viewpoints included for Part A. The more limited range of the viewpoints for the Part B assessment was decided on the basis that there are very few dwellings and other receptors within the Study Area, including highways and commercial development.</p> <p>Assessment of Public Rights of Way (PRoW):</p> <p>Footpaths were split into sections for Part A, whereas for Part B the worst case section of the footpath was assessed on the assumption that users would generally walk the whole footpath rather than a particular section so would experience the footpath as a whole. This is due to the broader network of PRoW for Part A that allows a more varied walking route selection, whereas the PRoW network associated with Part B is less well connected and therefore opportunities to vary routes are reduced and it is anticipated that walkers would use the whole PRoW route.</p>

Technical Topic	Summary of Assessment and Outcome
	<p>However, these assessments are directly comparable and the assessments for Part A and Part B both identify the users of the PRow as the highest order of sensitivity. Whilst the figures on Part A differentiate the sections of PRow where lower orders of impact are anticipated to arise, these are not specifically differentiated within the assessment schedule, therefore the assessments are comparable.</p> <p>Assessment of National Character Areas: National Character Areas (NCAs) were scoped out of the Part B assessment because the scale of Part B (and the extent and degree to which landscape change would arise is less than for Part A) in relation to the scale of the NCA would be such that there would be no possibility of Part B having a significant effect on the NCAs. Additionally, Part B would be predominantly online widening of an existing trunk road, whereas Part A would comprise an extensive offline section.</p> <p>Study areas: Part A and Part B both use a 2 km visual assessment Study Area (Part A was reduced from 5 km to 2 km during the assessment process). However, the Study Area for the landscape character assessment is 5 km for Part A and 2 km for Part B. This is due to the more open nature of the landscape for Part A affording wider appreciation of Part A in the landscape, and therefore requiring a wider Study Area. The Study Areas have been agreed through consultation.</p>
Cultural Heritage	<p>LiDAR assessment: A LiDAR assessment has been undertaken for Part A but not Part B. A review of the availability of LiDAR data suitable for archaeological assessment was undertaken for both Part A and Part B. For Part A, data covering a total of 250 hectares was available which allowed for assessment of the two large sections of Part A. However, for Part B it was established that available data only covered 150 m of Part B and therefore there was no merit in undertaking an assessment of such a small area.</p> <p>Trial trenching: The Order Limits of Part B extend immediately adjacent to the boundaries of two Scheduled Monuments (high value heritage assets). Following consultation with Historic England and NCC, targeted pre-consent trial trench evaluations were undertaken to determine if there were remains associated with Scheduled Monuments within the Order Limits of Part B. As the Order Limits of Part A do not comprise high value heritage assets, pre-consent trial trenching was not considered to be required, as agreed with Historic England and NCC.</p>
Biodiversity	<p>Survey areas: There are several differences in survey areas between Part A and Part B, for example Part A has a Phase 1 survey of 500 m and Part B is 50 m. Survey distances for Part A were identified by the Applicant prior to selection of the preferred option and therefore allowed for potential changes in the Part A alignment and design. Part B surveys were undertaken at a later stage when the alignment was well defined, which allowed survey distances to be refined. However, Natural England have been consulted for Part A and Part B (separately) and no concerns were raised.</p> <p>Appendices: The Part A appendices are baseline reports presenting results only, and the impact assessment is presented in full within Chapter 9: Biodiversity, Volume 2 of this ES (Application Document Reference: TR010041/APP/6.2). The Part B appendices present full baseline results, potential impacts, mitigation and significance of effect. This is then summarised in Chapter 9: Biodiversity, Volume 3 of this ES (Application Document Reference: TR010041/APP/6.3). However, the same level of information is presented for Part A and Part B and there is therefore no difference in the level of assessment.</p>
Road Drainage and the Water Environment	<p>Monitoring: The monitoring sections of Chapter 10: Road Drainage and the Water Environment, Volume 2 of this ES (Application Document Reference: TR010041/APP/6.2) for Part A and Chapter 10: Road Drainage and the Water Environment, Volume 3 of this ES (Application Document Reference: TR010041/APP/6.3) for Part B are different due to main rivers in Part A needing additional monitoring and as there are no main rivers within the Study Area for Part B.</p>

Technical Topic	Summary of Assessment and Outcome
	<p>Geomorphological assessment: A geomorphological assessment was undertaken for Part A as a result of the proposed new River Coquet Bridge and the sensitivity of the River Coquet and through consultation with the Environment Agency. This assessment was not required for Part B.</p> <p>Flood Risk Activities Permit (FRAP): A FRAP would only be required for Part A as there are no main rivers crossed by Part B.</p>
Geology and Soils	There are no differences in the assessment methodology between Part A and Part B.
Population and Human Health	<p>Agricultural Consultants: The significance of effect criteria terminology for agricultural land holdings for Part A and Part B is slightly different. However, as the application of the criteria is comparable the definition of a significant effect is comparable.</p> <p>Chapter 12: Population and Human Health, Volume 3 of this ES (Application Document Reference: TR010041/APP/6.3) presents detailed mitigation for agricultural land holdings for Part B, whereas the detailed mitigation for Part A is presented within the relevant appendix (and summarised in Chapter 12: Population and Human Health, Volume 2 of this ES (Application Document Reference: TR010041/APP/6.2)). However, as this is a difference in presentation and the implementation of mitigation itself is comparable, the outcome of the assessment is consistent.</p> <p>Employment by industry baseline data: Part A considers data for 2011, whereas Part B also considers data for 2017 / 2018, because the assessments were completed at different times. However, it is considered that there would be no material difference if 2017 / 2018 data was used for Part A.</p>
Material Resources	There are no differences in the assessment methodology between Part A and Part B.
Climate	There are no differences in the assessment methodology between Part A and Part B.
Assessment of Cumulative Effects	There are no differences in the assessment methodology between Part A and Part B.

4.4. GENERAL ASSESSMENT ASSUMPTIONS AND LIMITATIONS

- 4.4.1. The following assumptions have been made, and limitations encountered in the preparation of this ES:
- a. Potential impacts and their effects cannot be predicted with absolute certainty. The assessments carried out in the EIA are, however, based on the best information available at the time of writing and have followed appropriate, industry recognised guidance and techniques wherever possible. The assessments presented in this ES therefore indicate the most likely significant effects as a result of the Scheme.
 - b. The assessments presented in this ES have been based on the description of the Scheme as presented in **Chapter 2: The Scheme** of this ES. Following the submission of the draft DCO, the Scheme would progress to the next design stage (detailed design) whereby it is possible that there would be some variations to the Scheme as design and construction methodologies are further refined. However, any changes to the Scheme at the next design stage will be within the assessment parameters as detailed within **Chapter 2: The Scheme** of this ES, and the limits of deviation as shown on the **Works Plans (Application Document Reference: TR010041/APP/2.3)**.
 - c. The assessment has taken account of the limits of deviation in the **draft DCO (Application Document Reference: TR010041/APP/3.1)** in relation to the works that it would authorise.
 - d. The commencement of construction has been assumed to be December 2021, with the main construction works starting in March 2022, and the opening year of the Scheme to be 2024 (2024 for Part A and 2023 for Part B).
 - e. The construction strategy detailed in **Chapter 2: The Scheme** of this ES has been developed in consultation with the Buildability Advisor in the absence of the main contractor who would construct the Scheme. The effects of the Scheme during construction assessed within **Technical Chapters 5 to 15 of Volume 2** of this ES (**Application Document Reference: TR010041/APP/6.2**) for Part A and of **Volume 3** of this ES (**Application Document Reference: TR010041/APP/6.3**) for Part B are based on this information.
 - f. It is assumed that data and information received from third parties is accurate, complete and up-to-date.
 - g. The assessment has proceeded on the basis of reasonable worst-case assumptions.
- 4.4.2. Assumptions and limitations have been described on a topic by topic basis, within **Technical Chapters 5 to 15 of Volume 2** of this ES (**Application Document Reference: TR010041/APP/6.2**) for Part A and of **Volume 3** of this ES (**Application Document Reference: TR010041/APP/6.3**) for Part B.
- 4.4.3. Whilst the Scheme Opening Year would be 2024 (2024 for Part A and 2023 for Part B), and the Design Year 2039 (as discussed in **paragraph 4.1.10**), the traffic model has used the following scenarios:
- a. Baseline Year (2015).
 - b. Opening Year of the Scheme, i.e. when traffic can use it (2023).
 - c. Design Year of the Scheme, i.e. 15 years after opening which is typically considered to be the time when the Scheme would be operating at its most efficient, or when mitigation measures would be fully effective (2038).

- 4.4.4. Traffic model assumptions and limitations are detailed within **Chapter 4** of the **Case for the Scheme (Application Document Reference: TR010041/APP/7.1)**.

LIMITS OF DEVIATION

- 4.4.5. The **draft DCO (Application Document Reference: TR010041/APP/3.1)** contains powers of lateral and vertical deviation as shown on the **Works Plans (Application Document Reference: TR010041/APP/2.3)**. Further assessment parameters are detailed in **Chapter 2: The Scheme** of this ES for particular elements of the Scheme within the limits of deviation. On this basis the outputs of the assessment are not considered likely to change materially as a result of the limits of deviation.

4.5. SIGNIFICANCE CRITERIA

- 4.5.1. The approach to assessment has been based on the guidance in DMRB Volume 11 Section 2 Part 5 (**Ref. 4.8**). In accordance with the DMRB, the assessment covers the likely significant effects arising from the permanent and temporary, direct, indirect, secondary, cumulative, short, medium and long-term, beneficial and adverse effects of the Scheme.
- 4.5.2. The significance of effect is determined by combining the value or sensitivity of a receptor with the magnitude of change as shown in **Table 4-8** below which follows DMRB guidance (**Ref. 4.1**). The assessment of significance is carried out by taking into account committed design and mitigation measures that have been identified.
- 4.5.3. Each specific environmental topic may use slightly different significance criteria as outlined in DMRB Volume 11 Section 3 (**Ref. 4.1**). In addition, DMRB Volume 11 and IAN 125/15 (**Ref. 4.4**) advise on the method to be used for each specific environmental assessment. For the topics for which there is no such guidance, the effects have been identified using professional judgement and experience from similar schemes, where possible.

Table 4-8 - Matrix for determining the significance of effect

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

Source: Table 2.4 of DMRB Volume 11 Section 2 Part 5 (HA205/08)

- 4.5.4. It should be noted that effects, whether adverse or beneficial, assessed as ‘moderate’ or above significance are deemed to be significant. Effects determined to be slight or neutral are deemed to be not significant. Any deviation from this approach has been clearly documented in the relevant chapter of this ES.
- 4.5.5. The significance of effects within **Chapter 15: Assessment of Combined Effects, Volume 2** of this ES (**Application Document Reference: TR010041/APP/6.2**) for Part A, **Volume 3** of this ES (**Application Document Reference: TR010041/APP/6.3**) for Part B, and **Chapter 16: Assessment of Cumulative Effects, Volume 4** of this ES (**Application Document Reference: TR010041/APP/6.4**), were evaluated in a similar way as that described above. However, for this assessment when determining whether an effect is considered significant, effects of ‘slight’ (not significant) or above significance are taken into consideration, to account for the potential for multiple ‘non-significant’ effects to combine to result in an overall significant cumulative effect. Cumulative and in-combination effects are described further in the above chapters.

REPORTING SIGNIFICANT EFFECTS

- 4.5.6. This ES identifies potential impacts before mitigation but does not assess their significance. The ES only reports the significance of the environmental effects of the Scheme with consideration of the proposed mitigation.

4.6. DUPLICATION OF ASSESSMENT

- 4.6.1. A **Habitats Regulations Assessment (HRA)** (**Application Document Reference: TR010041/APP/6.14**) and **Flood Risk Assessment (FRA)** (**Appendix 10.1, Volume 7** of this ES (**Application Document Reference: TR010041/APP/6.7**) for Part A, and **Appendix 10.1, Volume 8** of this ES (**Application Document Reference: TR010041/APP/6.8**) for Part B) have been carried out to support information presented within this ES. These documents have been produced by the same teams and so the assessments that have taken place are complimentary rather than duplicated.

REFERENCES

Ref. 4.1 Design Manual for Roads and Bridges (DMRB) Volume 11 Section 3. Available at: <http://www.standardsforhighways.co.uk/ha/standards/dmr/vol11/section3.htm>

Ref. 4.2 The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017. Available at: <http://www.legislation.gov.uk/uksi/2017/572/contents/made>

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Ref. 4.4 Interim Advice Note 125/15. Supplementary guidance for users of DMRB Volume 11 'Environmental Assessment' Published October 2015.

Ref. 4.5 Department of Energy and Climate Change (2012) Power Lines: Demonstrating compliance with EMF public exposure guidelines. A voluntary code of practice. Available at: <https://www.gov.uk/government/publications/demonstrating-compliance-with-emf-public-exposure-guidelines-voluntary-code-of-practice>

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