A1 in Northumberland: Morpeth to Ellingham

Scheme Number: TR010059

6.38 Environmental Statement Addendum: Stabilisation Works for Change Request

Rule 8(1)(c)

Planning Act 2008

Infrastructure Planning (Examination Procedure) Rules 2010

March 2021

Infrastructure Planning

Planning Act 2008

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The A1 in Northumberland: Morpeth to Ellingham

Development Consent Order 20[xx]

Environmental Statement Addendum: Stabilisation Works for Change Request

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APPENDICES

1 INTRODUCTION

1.1 PURPOSE OF ES ADDENDUM

1.1.1. This Environmental Statement Addendum (this "ES Addendum") to the Environmental Statement (ES) [**APP-035** to **APP-336**] supports a request to amend an application for development consent [**REP3-004** and **REP3-005**].

1.1.2. An application for development consent [**REP3-004** and **REP3-005**], which included the ES [**APP-035** to **APP-336**], was submitted by Highways England (the "Applicant") to the Secretary of State for Transport via the Planning Inspectorate (the "Inspectorate") on 7 July 2020 for the A1 in Northumberland: Morpeth to Ellingham (the "Scheme").

1.1.3. The Scheme is formed of two parts known as Part A (Morpeth to Felton) and Part B (Alnwick to Ellingham). A full description of the Scheme can be found at **Chapter 2: The Scheme** of the ES [**APP-037**]. The ES sets out the findings of the Environmental Impact Assessment (EIA) that was carried out for the Scheme.

1.1.4. The application was accepted for Examination on 4 August 2020.

1.1.5. As is normal in relation to any engineering project, further design development of the Scheme has continued to be undertaken by the Applicant since the application for the Development Consent Order (DCO) was made in order to release efficiencies and design benefits. This is particularly important in optimising a scheme being delivered by the public sector in the public interest.

1.1.6. The proposed amendment to the application that this ES Addendum relates to is the carrying out of works on the north bank of the River Coquet in order to stabilise the proposed bridge and existing bridge within Part A of the Scheme (Stabilisation Works), which consist of the following:

a. The installation of three rows of piles in the north bank of the River Coquet;

b. The installation of temporary river training works and erosion protection measures on the north bank;

c. A total of 0.28 ha of land outside the existing Order limits of Part A would be required as a working area for the installation of the piles and access to works, as well as for the carrying out of the erosion protection measures. This area of land would be planted in accordance with the revised Ancient Woodland Strategy Part A for Change Request (submitted at Deadline 4), and therefore, as a worst-case, would be required permanently to enable appropriate management and maintenance of the woodland; and

d. As the installation works would lead to the loss of an additional 0.28 ha of woodland within the Coquet River Felton Park Local Wildlife Site (LWS), there would also be a requirement for 3.1 ha of additional permanent land to facilitate compensatory habitat outside the existing Order limits of Part A. This has been calculated at a rate of 1:12 (loss:creation) ratio for the purpose of woodland compensation.

1.1.7. The details of the Stabilisation Works proposed in this amendment are described in **Chapter 2: Stabilisation Works** of this ES Addendum and shown on **Figure 1: Stabilisation Works** in **Appendix A: Figures** of this ES Addendum.

1.1.8. The purpose of this ES Addendum is to ensure that the environmental impacts of the Stabilisation Works to the application have been appropriately assessed with any likely significant environmental effects identified, and to satisfy the requirements of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (EIA Regulations).

1.1.9. This ES Addendum presents an assessment of the likely significant effects as a result of the inclusion of the Stabilisation Works in the application. It is not a duplication of the ES, submitted with the application for development consent and should be read in conjunction with the ES.

1.2 SCOPE OF THE ES ADDENDUM

1.2.1. In order to understand if there would be significant environmental effects as a result of the inclusion of the Stabilisation Works in the application, a desktop assessment was carried out. The purpose of the desktop assessment was to consider whether the Stabilisation Works would alter the conclusion of the EIA already undertaken and reported in the ES. The outcome of the desktop assessment then informed a scoping exercise to identify if further EIA, in accordance with the EIA Regulations, would be required. The findings of the scoping exercise are presented in **Appendix B: Summary of Proposed Changes to Application** of this ES Addendum which sets out the proposed extent of the Stabilisation Works and proposed approach to assessment of environmental impacts. Certain topics have been scoped out of the assessment, and reasonings are provided within this appendix.

1.2.2. **Appendix B: Summary of Proposed Changes to Application** of this ES Addendum indicated that the Stabilisation Works have the potential to change the conclusions of Part A of the ES, for the:

a. Construction assessment for **Chapter 5: Air Quality Part A** of the ES [**APP-040**];
b. Construction assessment for **Chapter 6: Noise and Vibration Part A** of the ES [**APP-042];**
c. Construction and operational assessment for **Chapter 7: Landscape and Visual Part A** of the ES [**APP-044**];
d. Construction and operational assessment for **Chapter 8: Cultural Heritage Part A** of the ES [**APP-046**];
e. Construction and operational assessment for **Chapter 9: Biodiversity Part A** of the ES [**APP-048**];
f. Construction and operational assessment for **Chapter 10: Road Drainage and the Water Environment Part A** of the ES [**APP-050**];
g. Construction and operational assessment for **Chapter 11: Geology and Soils Part A** of the ES [**APP-052**];
h. Operational assessment for **Chapter 12: Population and Health Part A** of the ES [**APP-054**]. As the assessment has progressed, it was decided to also include a construction assessment for Population and Human Health;
i. Construction assessment for **Chapter 13: Material Resources Part A** of the ES [**APP-056**]; and
j. Construction assessment for **Chapter 14: Climate Part A** of the ES [**APP-058**].

1.2.3. The findings of the scoping exercise at **Appendix B: Summary of Proposed Changes to Application** of this ES Addendum confirmed that the Stabilisation Works do not change the conclusions of Part B of the ES due to localised nature of the works in Part A. This ES Addendum therefore presents an assessment of the likely significant effects as a result of the Stabilisation Works to the north of the River Coquet upon the above environmental topics for Part A.

APPROACH TO THE ASSESSMENT

1.2.4. The assessment has been carried out in line with the methodologies described in the ES, using the professional judgement of the competent experts detailed within the ES, unless otherwise stated in the relevant technical chapters in this ES Addendum.

1.2.5. The mitigation measures detailed in **Outline CEMP** [**REP3-013 and 014**] still apply for the Stabilisation Works. **Table E-1** in **Appendix E: Register of Environmental Actions and Commitments** of the ES Addendum details those measures that are additional or require amendment to those shown in the **Outline CEMP** [**REP3-013 and 014**] for the Stabilisation Works. If the Stabilisation Works are accepted by the Planning Inspectorate and Secretary of State for Transport, then the measures in **Table E-1** will be incorporated into the Outline CEMP.

1.3 CONSULTATION

1.3.1. A summary of consultation undertaken prior to the commencement of the non-statutory consultation on 29 January 2021 and any meetings is presented in **Table 1-1** below.

Table 1-1 - Summary of Consultation by Topic

Date / Method of Contact	Consultee / Name of Consultee	Overview of Consultation
Air Quality		
There has been no change to the assessment of significance and assessment methodology. Therefore, no consultation was required for the Stabilisation Works assessment.		
Noise and Vibration		
There has been no change to the assessment of significance and assessment methodology. Therefore, no consultation was required for the Stabilisation Works assessment.		
Landscape and Visual		
17/12/2020 Teleconference	Northumberland County Council (NCC)	**Key Topics** The Applicant presented to NCC the proposed Stabilisation Works. **Key Outcomes** The NCC Landscape Officer did not raise any concerns in relation to the Stabilisation Works. Further details have been provided in the **Consultation Statement** to be submitted at Deadline 4 (12 March 2021) of the Examination.
Cultural Heritage		
08/03/2021	NCC	The Applicant confirmed that the Written Scheme of Investigation for an Archaeological Trial Trench Evaluation had been updated to include the additional land take required for the additional compensatory habitat to the south-west of the River Coquet (submitted at Deadline 4). The Applicant proposed an additional 14 trial trenches in the area of the additional compensatory habitat.
Biodiversity		
16/12/2020 Teleconference	Natural England and Environment Agency	**Key Topics** The Applicant presented to Natural England and the Environment Agency the Stabilisation Works. The proposed Stabilisation Works would result in the loss of woodland within the Coquet River Felton Park Local Wildlife Site (LWS), for which mitigation and compensation would be required. The Applicant presented a proposed approach and, in acknowledgement of proposed soil salvage efforts and replanting post-construction, woodland creation (compensation) at a ratio of 1:6 (loss:creation) was proposed. Natural England raised concern regarding the proposed scour protection of the north bank. Natural England stated the River Coquet and Coquet Valley Woodlands Site of Special Scientific Interest (SSSI) is designated for its morphology, form and function. Natural England see the use of scour protection as a permanent loss of bank habitat that would require compensation. The Environment Agency raised that in addition to construction impacts, operational impacts should also be considered in relation to the scour protection as there is the potential for materials to enter the river over the lifespan of the scour protection. This was supported by Natural England. The Environment Agency stated that the control of run-off entering the watercourse during the works should be considered and mitigation developed. **Key Outcomes** Natural England confirmed that, in relation to loss of woodland, they would prefer the approach detailed within the **Ancient Woodland Strategy Part A** [**APP-247**] (revised **Ancient Woodland Strategy for Change Request** has been submitted at Deadline 4) to be applied. This would constitute a 1:12 (loss:creation) ratio for the purpose of woodland compensation. The Applicant agreed to this approach.

Date / Method of Contact	Consultee / Name of Consultee	Overview of Consultation
		Regarding the proposed scour protection, it has been determined that there is a requirement to protect the bridge foundations from hydraulic action and that scour protection measures are required to maintain the integrity of the proposed design. The currently preferred scour protection solution is a rock armour revetment which maintains the existing channel cross section profile. This protects the bridge foundation and also prevents scour from outflanking the solution through erosion of the banks in the downstream reach. The Applicant has not concluded that compensatory provision for the loss of riverbank is necessary. The Applicant has considered the operational impacts from the proposed scour protection in this ES Addendum. The Applicant has considered mitigation to control run-off entering the river during construction. Further details will be provided in the **Consultation Statement** which has been submitted at Deadline 4 (12 March 2021) of the Examination.
17/12/2020 Teleconference	Northumberland County Council (NCC)	**Key Topics** The Applicant stated that it is intended to compensate the loss of woodland within the Coquet River Felton LWS using the same approach as detailed within the **Ancient Woodland Strategy Part A** [**APP-247**] (revised **Ancient Woodland Strategy for Change Request** has been submitted at Deadline 4). This was agreed following consultation with Natural England (16/12/2020). NCC's Ecologist requested confirmation that the baseline ecological surveys covered the proposed additional land take areas. NCC's Ecologist requested confirmation that pre-commencement surveys are in place relating to protected species and the proposed additional land take. **Key Outcomes** NCC's Ecologist confirmed agreement with the approach to woodland compensation. It was also agreed by both parties that the significance of effect would remain the same, given the same impacts and mitigation would occur, only over a slightly larger area. The Applicant confirmed that baseline ecological surveys extended beyond the Order limits by at least 100 m. The Applicant confirmed that existing baseline survey data has been used to inform this ES Addendum. The Applicant confirmed that existing mitigation, detailed in **Section 9.9, Chapter 9: Biodiversity Part A** of the ES [**APP-048**] includes pre-commencement surveys for otter, badger, bats and great created newts (of relevance to the Stabilisation Works). NCC raised no other queries in relation to biodiversity. Further details have been provided in the **Consultation Statement** to be submitted at Deadline 4 (12 March 2021) of the Examination.
03/02/2021 Email	Natural England	**Key Topic** The Stabilisation Works would result in the loss of an additional 0.04 ha of woodland to the west of the existing A1 road bridge that falls within the zone of influence assessed within the draft great crested newt licence previously reviewed by Natural England (**Appendix 9.24 Great Crested Newt Method Statement River Coquet Part A** of the ES [**APP-250**]). The additional area of woodland is between approximately 130 m and 190 m from great crested newt pond A19, which supported a small population of great crested newts (peak count of four adults during the 2017 survey). The additional area of woodland would be cleared to facilitate construction and replanted as woodland upon completion of construction. As such, for the purpose of the future licence application, the Stabilisation Works would result in the temporary loss of an additional 0.04 ha of woodland within the Intermediate impact zone (50 to 250 m from pond). The additional area of woodland to be cleared would be included within the area surrounded by temporary exclusion fencing and subject to the same capture and exclusion period and protocols as detailed within the existing method statement. A Letter of No Impediment (LONI) with caveats was previously issued by Natural England in May 2020 for the existing draft licence [**APP-250**]. The existing LONI includes a number of caveats that Natural England confirmed would need to be addressed before the licence application is formally submitted (which have been accepted by the Applicant). The caveats already include changes to the areas of permanent and temporary

Date / Method of Contact	Consultee / Name of Consultee	Overview of Consultation
		habitat loss. As the Stabilisation Works result in a very minor amendment to the existing draft licence documentation, the Applicant proposed that agreement be captured through an updated LONI rather than requiring a review of an updated draft licence. **Key Outcome** Natural England provided a response within a meeting dated 05/02/2021, see below.
05/02/2021 Teleconference	Natural England	**Key Topic** Further to the email dated 03/02/2021 (see above), the Applicant requested comment on the proposed approach to capturing agreement with the changes to the draft great crested newt licence in response to the Stabilisation Works. **Key Outcome** Natural England agreed that this could be captured within an updated LONI rather than requiring a review of an updated draft licence.
Road Drainage and the Water Environment		
16/12/2020 Teleconference	Natural England and Environment Agency	**Key Topics** The Applicant presented the approach to the environmental assessment reported in this ES Addendum. Natural England raised concern regarding the proposed scour protection of the north bank. Natural England confirmed the River Coquet and Coquet Valley Woodlands SSSI is designated for its river type, and flora and fauna. **Key Outcomes** Natural England see the use of scour protection as a permanent loss of bank habitat that would require compensation. The Applicant has not concluded that compensatory provision for the loss of riverbank is necessary. Further details have been provided in the **Consultation Statement** to be submitted at Deadline 4 (12 March 2021) of the Examination.
04/03/2021	Environment Agency	**Key Topics** The Applicant presented the results of a preliminary scour protection assessment undertaken to further inform the nature and extent of the permanent scour protection required for the north and south banks of the River Coquet.. Consideration given by the Applicant to a range of potential habitat compensation measures was presented. Points raised by the Environment Agency in their consultation response to **ES Addendum: Earthworks Amendments for Change Request, ES Addendum: Stabilisation Works for Change Request** and **ES Addendum: Southern Access Works for Change Request** with respect to the Water Framework Directive (WFD) were discussed. The Applicant presented current progress with the River Coquet hydraulic modelling and timescales for completion and review were discussed. The points raised by the Environment Agency in their consultation and the Applicant's responses are provided in the **Consultation Statement** (submitted at Deadline 4). **Key Outcomes** An update to **Appendix 10.2: Water Framework Directive Assessment Part A** of the ES **[APP-255]** would be required to reflect the changes described in this ES Addendum and in **ES Addendum: Southern Access Works for Change Request**.

Date / Method of Contact	Consultee / Name of Consultee	Overview of Consultation
		The need for compensation referred to by the Environment Agency in their consultation response to **ES Addendum: Earthworks Amendments for Change Request, ES Addendum: Stabilisation Works for Change Request** and **ES Addendum: Southern Access Works for Change Request** relates to compensation for the loss of SSSI habitat. The Applicant has not concluded that compensatory provision for the loss of riverbank is necessary. The timescales allocated for Environment Agency review of the River Coquet hydraulic model are reasonable, with consideration to be given to whether any opportunities for feedback during the review process is possible.
Geology and Soils		
There has been no change to the assessment of significance and assessment methodology. Therefore, no consultation was required for the Stabilisation Works assessment.		
Population and Human Health		
There has been no change to the assessment of significance and assessment methodology. Therefore, no consultation was required for the Stabilisation Works assessment.		
Material Resources		
There has been no change to the assessment of significance and assessment methodology. Therefore, no consultation was required for the Stabilisation Works assessment.		
Climate		
There has been no change to the assessment of significance and assessment methodology. Therefore, no consultation was required for the Stabilisation Works assessment.		
Cumulative Effects		
There has been no change to the assessment methodology. Changes to the assessment of significance relate to Biodiversity and Road Drainage and the Water Environment cross topic combined effects and have been considered as part of the consultation undertaken for those topics, as detailed above.		

1.3.2. Based on the meeting with Environment Agency and Natural England, the operational impacts of the proposed scour protection have been considered in the Biodiversity and Road Drainage and Water Environment assessments presented in this ES Addendum. This has resulted in the scope of the environment sensitivity assessments as presented in **Appendix B: Summary of Proposed Changes to Application** of this ES Addendum evolving to include these aspects of the assessment.

1.3.3. The Environment Agency and Natural England have lodged representations to the Planning Inspectorate in relation to the Stabilisation Works. Both the Environment Agency and Natural England raised concerns relating to the Stabilisation Works, in particular to the permanent loss of riverbank associated with the proposed scour protection.

1.3.4. The West End Anglers has also lodged a representation to the Planning Inspectorate in relation to the Stabilisation Works. The West End Anglers main concerns relate to access to the riverbank under the A1 viaduct during operation and construction and the impact of scour protection on fish passage. The riverbank would be accessible during the operation of the Stabilisation Works, however during construction access would be limited for health and safety reasons. As detailed in **Chapter 7: Biodiversity** of this ES Addendum, the Stabilisation Works would not significantly affect fish passage during construction or operation.

1.3.5. Non-statutory consultation was held between 29 January and 25 February 2021, with the following consultees providing responses in relation to the Stabilisation Works:

a. Natural England;
b. Environment Agency;
c. Northumbrian Wildlife Trust;
d. West End Angler's Club;
e. Historic England;
f. Northumberland County Council; and
g. The Coal Authority.

1.3.6. Further detail of these responses is provided within the **Consultation Statement** submitted at Deadline 4 of the Examination.

1.4 STRUCTURE OF THE ES ADDENDUM

1.4.1. This ES Addendum consists of the following:

a. ES Addendum Main Text, setting out the environmental assessment.
b. ES Addendum Technical Appendices (including ES Addendum Figures)

i. **Appendix A**: **Figures**
ii. **Appendix B**: **Summary of Proposed Changes to Application**
iii. **Appendix C: Visual Effects Schedule**
iv. **Appendix D: River Coquet Valley Slope Instability**
v. **Appendix E: Register of Environmental Actions and Commitments**
vi. **Appendix F: Preliminary Scour Assessment**

c. Non-Technical Summary (NTS)

1.4.2. The ES Addendum Main Text follows the content structure set out below:

a. **Chapter 1: Introduction** - Provides introduction to this ES Addendum including the purpose of the document, a brief overview of the Stabilisation Works, the scope of the assessment and a summary of consultation.
b. **Chapter 2: Stabilisation Works** - Provides a description of the Stabilisation Works.
c. **Chapter 3: Assessment of Alternatives** provides a description of the reasonable alternative considered and justification for the chosen option.
d. **Chapter 4 – 13** details the EIA process, legislative and policy framework, methodology, design, mitigation and enhancement measures and the likely significant effects for each of the environmental topics assessed in this ES Addendum, including:

    i. **Chapter 4: Air Quality**
    ii. **Chapter 5: Noise and Vibration**
    iii. **Chapter 6: Landscape and Visual**
    iv. **Chapter 7: Cultural Heritage**
    v. **Chapter 8: Biodiversity**
    vi. **Chapter 9: Road Drainage and the Water Environment**
    vii. **Chapter 10: Geology and Soils**
    viii. **Chapter 11: Population and Human Health**
    ix. **Chapter 12: Material Resources**
    x. **Chapter 13: Climate**
    xi. **Chapter 14: Assessment of Cumulative Effects**

e. **Chapter 15**: **Summary** - Provides a summary of the likely significant effects reported in this ES Addendum.
f. **Chapter 16: Abbreviations**

1.4.3. Within each chapter of this ES Addendum, updated information is presented under the same section headings as the original assessment of the ES. Where text has not changed, it is stated under the section headings, unless otherwise indicated.

2 STABILISATION WORKS

2.1 INTRODUCTION

2.1.1. The content of **Chapter 2: The Scheme** of the ES [**APP-037**] remains unchanged and valid, with the exceptions of the additions and changes outlined below.

2.2 NEED FOR THE STABILISATION WORKS

JUSTIFICATION FOR STABILISATION WORKS

2.2.1. As is usual with an infrastructure project of this nature, further detailed ground investigation and design has been undertaken in parallel with the DCO application process. It was identified in December 2019 that supplementary ground investigation would be required to inform the detailed design work for the Scheme. This ground investigation was undertaken between January and March 2020 followed by analysis of the results with the first draft report being available on 17 July 2020 (therefore, after the application had been submitted on 7 July 2020). The results were reviewed over the summer of 2020, with the latest report being available on 2 December 2020.

2.2.2. The review of the geological and geotechnical information, including the reporting of the ground investigation works undertaken between January and March 2020, has identified that the north slope of the River Coquet Valley is suffering from instability. Without treatment this could cause a failure in the slope during the construction and operation of the new bridge and could also have a detrimental impact on the existing bridge structure.

2.2.3. A number of options have been considered to address the instability and a number of piling configurations have been considered. The proposed solution comprises spaced, bored piles, ensuring the stability of the northern valley sides and allowing the new pier foundation to be installed. This is considered to be the best solution given the slope failure mechanism and depth of failure surface.

2.2.4. The benefits of the Stabilisation Works are as follows:

a. Stabilise the northern slope such that the new bridge foundations are not adversely impacted by slope instability movement.
b. Stabilise the northern slope such that the existing bridge is not impacted by slope movement in the future.
c. Provide a position from which traditional foundations can be constructed for the northern pier and abutment.
d. Provide stabilisation of the slope such that the new bridge would not be destabilised.

2.2.5. **Appendix D: River Coquet Valley Slope Instability** of this ES Addendum provides further detail on the slope failure mechanism and proposed stabilisation solution.

JUSTIFICATION FOR SCOUR PROTECTION

2.2.6. A preliminary hydraulic analysis of distributed design flows and velocities within the river corridor has been undertaken to identify the scour risk on the north bank of the River Coquet. This analysis has indicated that there is a scour risk on the north bank of the River Coquet and concluded that scour protection systems are required to maintain the integrity of the proposed design. The proposed scour protection comprises a hard engineered 'grey'

solution in closer proximity to the structure in the form of rock armour moving to a green-grey solution for the reinstated banks outside the zone of protection required for the bridge foundations. Green-grey solutions are a hybrid of engineered and biodegradable / vegetated solutions that are considered more environmentally sensitive but have a greater resistance to scour than green solutions like wood revetment or biodegradable vegetated matting. Further analysis will be undertaken to further define the design criteria, particularly the hydraulic conditions and a 2-D hydraulic model will be used to inform the scour design process. The scour design will be refined, where possible, in order to reduce impacts on the environment. Further details are provided in **Appendix F: Preliminary Scour Assessment** of this ES Addendum.

2.3 STABILISATION WORKS LOCATION

2.3.1. The activities associated with the Stabilisation Works would be located at the northern end of Part A, as shown in **Figure 2: Location Plan and Compensatory Habitat Location** in **Appendix A: Figures** of this ES Addendum.

2.3.2. As detailed in **paragraph 2.3.5**, the Stabilisation Works would require additional permanent land to facilitate compensatory habitat. This compensatory habitat would be located to south-west of the River Coquet, as shown on **Figure 2: Location Plan and Compensatory Habitat Location** in **Appendix A: Figures** of this ES Addendum.

2.3.3. The remaining Scheme location details within **Section 2.3, Chapter 2: The Scheme** of the ES [**APP-037**] remains unchanged and valid.

STABILISATION WORKS FOOTPRINT

2.3.4. Additional land would be required outside the existing Order limits of Part A in order to install the piles and provide erosion protection along the north bank of the River Coquet. The extent of this additional land would be approximately 0.28 ha and is shown in the **Figure 1: Stabilisation Works** in **Appendix A: Figures** of this ES Addendum. This area of land would be planted in accordance with the revised **Ancient Woodland Strategy Part A for Change Request** (submitted at Deadline 4) and therefore, as a worst-case, would be required permanently to enable appropriate management and maintenance of the woodland.

2.3.5. The use of the additional land outside the existing Order limits of Part A for the installation works and erosion protection would lead to the clearance of 0.28 ha of woodland within the Coquet River Felton Park LWS. For the purposes of mitigation, this woodland is treated as ancient woodland, and therefore the ratio of loss:creation is 1:12 in accordance with the revised Ancient Woodland Strategy Part A for Change Request (submitted at Deadline 4) as agreed with Natural England and Northumberland County Council. The 0.28 ha of woodland within the Coquet River Felton Park LWS that would be cleared would be planted in accordance with the revised Ancient Woodland Strategy Part A for Change Request (submitted at Deadline 4) . This means, as a worst-case, this 0.28 ha would be acquired permanently to enable appropriate management and maintenance of the woodland. In addition to compensate for the loss of woodland, there would be a requirement for the creation of additional compensatory habitat, which would require additional permanent land outside the Order limits of Part A, as shown in **Figure 2: Location Plan and Compensatory Habitat Location** in **Appendix A: Figures** of the ES Addendum. The extent of the additional compensatory habitat would therefore be approximately 3.1 ha in accordance with the 1:12 (loss:creation) woodland creation ratio.

OVERVIEW OF SURROUNDING AREA

2.3.6. An element of the Stabilisation Works would be undertaken within the River Coquet and Coquet Valley Woodlands SSSI and the Coquet River Felton Park LWS. The closest receptor is a residential receptor located approximately 350 m to the north-east of the Site at Felton Park. The closest Listed Building is the Grade II Listed 'Boundary Stones to the South and South West of Longfield Cottage', located approximately 350 m north of the Site.

2.3.7. The permanent land required for the provision of compensatory habitat is also located outside the existing Order limits of Part A. This land falls within the revised Order limits, as shown on **Figure 2: Location Plan and Compensatory Habitat Location** in **Appendix A: Figures** of this ES Addendum The land is located entirely within West Moor Farm, in an area of land classified by the Agricultural Land Classification as Grade 3b (not 'best and most versatile'). The closest receptor to the permanent land proposed for compensatory habitat is approximately 700 m south in the hamlet of West Moor. The closest Listed Building is the Grade II Listed 'Milepost Approximately 55 Metres South West of Thurston New Houses Farmhouse', located approximately 600 m south-east.

2.4 STABILISATION WORKS DESCRIPTION

2.4.1. The content of **Section 2.5, Chapter 2: The Scheme** of the ES [**APP-037**] remains unchanged and valid, with the exception of the additions and changes outlined below.

2.4.2. The revised **General Arrangement Plans for Change Request** (submitted at Deadline 4) illustrates the main components of the Scheme including these design changes.

2.4.3. The Stabilisation Works would be required on the north bank of the River Coquet and would comprise two rows of spaced piles to the north side of the proposed pier location for the River Coquet bridge and a third row to the south side as shown in the **Figure 1: Stabilisation Works** in **Appendix A: Figures** of this ES Addendum. All the piles would be concrete and approximately 600 mm in diameter and indicatively 14 m in length.

2.4.4. All of the permanent piling works would be within the existing Order limits of Part A. However, construction of the piling works within the existing Order limits of Part A would present engineering challenges due to insufficient space for safe access for construction plant within the existing Order limits. It is therefore necessary to provide temporary working areas in order to ensure that the Stabilisation Works can be carried out and this requires further additional land outside the existing Order limits of Part A. This is shown on **Figure 2: Location Plan and Compensatory Habitat Location** in **Appendix A: Figures** of this ES Addendum.

2.4.5. As explained in **paragraph 2.2.6** of this ES Addendum, it has been determined that there is a requirement to protect the bridge foundations from hydraulic action and that scour protection measures are required to maintain the integrity of the proposed design. The Stabilisation Works on the slope would, therefore, include scour protection along the river's edge on the north bank of the River Coquet to provide erosion protection to the lower stabilisation piles to avoid further maintenance works during the design life of the structure, which is 120 years.

2.4.6. The results of the preliminary scour assessment indicated that the best scour protection solution is a rock armour revetment which maintains the existing channel cross section profile and grey-green bank protection at the downstream end. This protects the bridge

foundation and also prevents scour from outflanking the solution through erosion of the banks in the downstream reach.

2.4.7. A reasonable environmental worst case scenario has been used for the assessment presented in this ES Addendum. The worst case scenario for the scour protection is 86 m of scour protection on the north bank, with 62 m of rock armour plus an additional 24 m of green-grey bank protection at the downstream end. This equates to a total of 1,200 m^3 (or 2, 640 tonnes) of rock armour and 93 m^3 of grey-green bank protection (e.g. a geotextile turf type solution) The location of the scour protection is shown on **Figure 1: Stabilisation Works** in **Appendix A: Figures** of this ES Addendum.

2.5 ENVIRONMENTAL DESIGN

2.5.1. The proposed use of land outside the existing Order limits of Part A for the installation of the Stabilisation Works would lead to the loss of 0.28 ha of woodland within the Coquet River Felton Park LWS. For the purposes of mitigation, this woodland is treated as ancient woodland, and therefore the ratio of loss:creation is 1:12 in accordance with the revised **Ancient Woodland Strategy Part A for Change Request** (submitted at Deadline 4) as agreed with Natural England and Northumberland County Council. The 0.28 ha of woodland within the Coquet River Felton Park LWS that would be cleared would be planted in accordance with the revised **Ancient Woodland Strategy Part A for Change Request** (submitted at Deadline 4) . In addition to compensate for the loss of woodland, there would be a requirement for the creation of additional compensatory habitat, which would require additional permanent land outside the existing Order limits of Part A. The extent of the additional compensatory habitat would be approximately 3.1 ha in accordance with the approach detailed in the revised **Ancient Woodland Strategy Part A for Change Request** (submitted at Deadline 4). As detailed in **Table 1-1**, consultation regarding the approach to the compensatory habitat has been undertaken with Northumberland County Council and Natural England. Further details have been provided in the **Consultation Statement** submitted at Deadline 4 (12 March 2021) of the Examination. A proposed location for permanent land to facilitate compensatory habitat is shown on the **Figure 2: Location Plan and Compensatory Habitat Location** in **Appendix A: Figures** of this ES Addendum and has been considered within the environmental assessments presented in this ES Addendum. This would require an extension of the existing Order limits of Part A in that location.

2.5.2. The environmental design of the remaining elements of the revised Scheme would not change from that contained in **Chapter 2: The Scheme** of the ES [**APP-037**].

2.6 CONSTRUCTION

2.6.1. The content of **Section 2.8, Chapter 2: The Scheme** of the ES [**APP-037**] remains unchanged and valid, with the exception of the additions outlined below.

2.6.2. The construction works associated with the Stabilisation Works would last approximately six months, with the piling works taking place in summer 2022. During this time, the construction would include the formation of access to the work area (including any site clearance required) and the preparation of piling platforms and access routes to these, for the installation of the Stabilisation Works as shown on **Figure 1: Stabilisation Works** in **Appendix A: Figures** of this ES Addendum. The Stabilisation Works would involve the construction of two rows of spaced piles to the north side of the proposed pier location for

the new bridge and a third row to the south side near the toe of the slope. The area would then be used for the construction of the new bridge structure and therefore would not be reinstated until completion of the permanent works.

2.6.3. The additional land required outside of the existing Order limits of Part A would be used for the provision of working platforms and access routes to and around the platforms for use by the plant and equipment required for the construction process, as shown in **Figure 1: Stabilisation Works** in **Appendix A: Figures** of this ES Addendum. Given the nature of the required works and the requirement for large construction plant to access the slope, this could not be carried out within the existing Order limits of Part A. The additional land would also support the movement of the equipment around the piles (once installed) to the rest of the works in the area in this challenging topography. The formation of the accesses and platforms would involve the localised grading of areas, as well as the cutting and filling of several benches within the existing slope.

2.6.4. The Stabilisation Works would involve the creation of a dry area to allow reparation of the riverbed to accept river training works. The location of the temporary training works are shown on **Figure 1: Stabilisation Works** in **Appendix A: Figures** of this ES Addendum. The installation of temporary river training works is expected to take approximately four weeks and would likely be in place for approximately 16 months (July 2022 until November 2023).

2.6.5. The plant which would be used during construction include:

a. Excavators;
b. Dump trucks;
c. Dumpers;
d. Delivery wagons (stone / concrete etc);
e. Piling rigs;
f. Cranes; and
g. Compaction equipment.

2.6.6. Access to the site would be from the north of the Site, as shown in **Figure 1: Stabilisation Works** in **Appendix A: Figures** of this ES Addendum.

2.6.7. The Stabilisation Works would require approximately one week of overnight road closures on the A1 at the River Coquet bridge to safely construct the run in and install the temporary barrier at the start of the works, and then again to remove and reinstate at completion.

CHANGES TO TRAFFIC FLOWS

2.6.8. The content of **Section 2.7, Chapter 2: The Scheme** of the ES [**APP-037**] remains unchanged and valid, with the exception of the additions outlined below.

2.6.9. The requirement for additional construction activities associated with the Stabilisation Works would generate construction traffic movements additional to those assessed in the ES, including:

a. 166 Heavy Good Vehicles (HGV) movements associated with the transport of 500 m^3 concrete;
b. 400 HGV movements associated with the transport of 1,500 m^3 rock armour (steel bodied trucks so limited weight);

c. 350 HGV movements associated with the transport of 3,500m^3 temporary stone; and

d. 1,400 HGV movements associated with the temporary cut and fill. In-site movements would be on 25 tonne articulated dump trucks, therefore it is assumed there would be 700 loads which would include allowance for reuse of some of the cut material.

2.6.10. The Stabilisation Works would not change the operational traffic flows.

2.7 OPERATIONAL MAINTENANCE AND MANAGEMENT

2.7.1. The content of **Section 2.9, Chapter 2: The Scheme** of the ES [**APP-037**] remains unchanged and valid, with the exception of the additions outlined below

2.7.2. The operational maintenance and management measures outlined in the ES Part A and the **Outline CEMP** [**REP3-013 and REP3-014**] would remain the same as originally proposed. As outlined in **Appendix E: Register of Environmental Actions and Commitments** of this ES Addendum, following completion of construction of the Stabilisation Works (including scour protection), the main contractor would be responsible for defects over a set period (generally 12 months). After this period the Stabilisation Works (including scour protection) would be adopted by the Applicant and fall within their routine schedule of maintenance and inspections. Towards the end of the construction period the CEMP would be developed as a Handover Environmental Management Plan (HEMP) which would include the monitoring and management arrangements of the Stabilisation Works (including scour protection) going forward during future maintenance and operation.

3 ASSESSMENT OF ALTERNATIVES

3.1.1. Since the submission of the Summary of the Proposed Changes to the Application document submitted as part of Deadline A of the Examination in December 2020 (see **Appendix B: Summary of Proposed Changes to Application** of this ES Addendum) the design has evolved and been refined in order to reduce environmental effects. These design changes are a result of consultation undertaken on the Stabilisation Works.

3.1.2. **Table 1-1** details the consultation in relation to the Stabilisation Works undertaken prior to the commencement of the non-statutory consultation.

3.1.3. Non-statutory consultation was held between 29 January and 25 February 2021, with the following consultees providing responses in relation to the Stabilisation Works:

a. Natural England;
b. Environment Agency;
c. Northumbrian Wildlife Trust;
d. West End Angler's Club;
e. Historic England;
f. Northumberland County Council; and
g. The Coal Authority.

3.1.4. Further detail of these responses is provided within the **Consultation Statement** submitted at Deadline 4 of the Examination.

3.1.5. The comments raised prior to the non-statutory consultation and as part of the non-statutory consultation have been considered and influenced design as shown in **Table 3-1**.

Table 3-1 – Environmental considerations in the evolution of the design

Environmental topic	Consultation Comments		Original Design	Amended Design	Reason for Changes and Effects
River Training Works on North Bank					
Biodiversity Road Drainage and the Water Environment	As part of the consultation, concerns were raised in relation to the river training works. It was raised that the river training works should not damage existing geomorphological features of value at the site or downstream.	Length of the temporary river training works: c.80 m Position of the works within the river channel: minimum channel width of c.20 m	Length of the temporary river training works: c.80.5 m Position of the works within the river channel: minimum channel width of c.24 m	Based on feedback received from consultees, the temporary training works have been realigned and bought closer to the river bank on the north bank. The amended river training works design has a number of benefits: – The alignment of the river training works is closer to the river bank than the original option, lessening the extent of constriction to the width of the river by up to 6 m. – The river training works are better aligned with the river bank, therefore changes in flow patterns are likely to be more muted. – Approximately 17 m of the riverbank within the affected 80 m stretch of the river, comprises non-natural bank, hence the length of affected natural river bank is c. 63 m. The amended river training works are a similar length to the original design, meaning there would be no new impacts on receptors. With the implementation of the mitigation set out in **Chapter 8: Biodiversity**, **Chapter 9: Road Drainage and the Water Environment** and **Appendix E: Register of Environmental Actions and Commitments** of this ES Addendum, there are not expected to be any additional effects on receptors.
Permanent Scour Protection on North Bank					
Biodiversity Road Drainage and the Water Environment	During consultation, it was raised that rock armour is not favourable due to its visual and geomorphological impact and the limitations it can pose on ecology. Furthermore, it is also unlikely to have a lifespan to match that of the bridge	Form of the permanent scour protection: Rock armour	Form of the permanent scour protection type: Combination of rock armour and form of grey-green bank protection (e.g. a geotextile turf type solution)	Based on feedback received from consultees and the results of a preliminary hydraulic assessment and preliminary scour assessment (**Appendix F: Preliminary Scour Assessment**), the type of permanent scour protection proposed has been amended and the length of rock armour has been reduced from 80 m to 62 m. The amended permanent scour protection design has a number of benefits: – As a result of the use of green-grey bank protection, the amended design represents a 22.5 % reduction in hard bank (grey) protection compared to the original design. Whilst the range of impacts identified with the original design would remain with the amended design, many of the impacts would be reduced in their extent and / or severity as a result of the benefits outlined above. The design of the scour protection is being further developed. As detailed in **paragraph 2.2.6** and **Appendix F: Preliminary Scour Assessment** of this ES Addendum, further analysis is being undertaken and the scour design is being further refined to limit impacts on the environment where possible.
	As part of the consultation, concerns that permeant scour protection along the north bank of the River Coquet could damage riverbank habitat and geomorphological process were raised.	Permanent scour protection length: 80 m	Permanent scour protection length: Rock armour (62 m) and grey-green bank protection (24 m)		

4 AIR QUALITY

4.1 INTRODUCTION

4.1.1. **Chapter 5: Air Quality Part A** of the ES [**APP-040**] considers the likely significant effects of Part A on Air Quality. The results of the assessment show that there are no significant air quality effects resulting from Part A.

4.1.2. This section of the ES Addendum considers only the likely significant effects of the Stabilisation Works on Air Quality. As detailed in **Appendix B: Summary of Proposed Changes to Application** of this ES, the Stabilisation Works are not anticipated to impact operational Air Quality and therefore this has not been considered in this chapter.

4.2 COMPETENT EXPERT EVIDENCE

4.2.1. As detailed in **Table 4-1**, the professionals contributing to the production of this assessment have sufficient expertise to ensure the completeness and quality of this assessment. The table sets out the details of expertise where this is different to those presented in the ES.

Table 4-1 – Air Quality Professional Competence

Name	Role	Qualifications and Professional Membership	Experience
Sioni Hole	Author	MPhys, Physics Associate of the Institute for Environmental Scientist (AIES) Associate of the Institute for Air Quality Management (AIAQM)	Six years of relevant Environmental Impact Assessment (EIA) experience - Air Quality specialist on the A1 Birtley to Coal House Stages 2 and 3 Assessments - Air Quality specialist on the A1 Scotswood to North Brunton Stages 2 and 3 Assessments - Air Quality specialist for the A1(M), M27 and M3 smart motorway schemes
Bethan Tuckett-Jones	Reviewer	BSc, Physics PhD Meteorology Member of the Institution of Environmental Sciences (MIES) Member of the Institute of Air Quality Management (MIAQM)	20 years of relevant EIA experience: - Air Quality technical lead on the A1 Birtley to Coal House Stages 2 and 3 Assessments - Air Quality technical lead on the A1 Scotswood to North Brunton Stages 2 and 3 Assessments

Name	Role	Qualifications and Professional Membership	Experience
			- Air Quality technical lead for the A1(M), M27 and M3 smart motorway schemes

4.3 LEGISLATIVE AND POLICY FRAMEWORK

4.3.1. The legislative and policy framework for Air Quality has not changed since the publication of the ES. Therefore, the text within **Section 5.3, Chapter 5: Air Quality Part A** of the ES [**APP-040**] remains valid.

4.4 ASSESSMENT METHODOLOGY

4.4.1. In order to ensure a comparable assessment with the ES, the assessment methodology followed for Air Quality has not changed in response to the Stabilisation Works. Therefore, the text within **Section 5.4, Chapter 5: Air Quality Part A** of the ES [**APP-040**] remains unchanged and valid.

4.5 ASSESSMENT ASSUMPTIONS AND LIMITATIONS

4.5.1. The assessment assumptions and limitations for Air Quality for the Stabilisation Works have not changed from the ES. Therefore, the text within **Section 5.5, Chapter 5: Air Quality Part A** of the ES [**APP-040**] remains unchanged and valid.

4.6 STUDY AREA

4.6.1. The Study Area for the assessment of construction dust set out within **Section 5.6, Chapter 5: Air Quality Part A** of the ES [**APP-040**] is extended slightly as a result of the Stabilisation Works. The Study Area consists of a 200 m corridor about the Order limits of Part A. The original Study Area is shown **in Figure 5.4: Construction Receptors Part A** of the ES [**APP-078**], and the new Study Area is shown in **Figure 3: Environmental Constraints** in **Appendix A: Figures** of this ES Addendum.

4.6.2. The Stabilisation Works would result in an extension to the Order limits of Part A, however, there are no additional receptors sensitive to air quality impacts arising from construction works as a result of the Stabilisation Works (including the compensatory habitat). Therefore, the text covering the construction aspect of Part A set out **within Section 5.6, Chapter 5: Air Quality Part A** of the ES [**APP-040**] remains unchanged and valid.

4.7 BASELINE CONDITIONS

4.7.1. The baseline for the Air Quality assessment has not changed for the Stabilisation Works. Therefore, the text within **Section 5.7, Chapter 5: Air Quality Part A** of the ES [**APP-040**] remains unchanged and valid.

4.8 POTENTIAL IMPACTS

CONSTRUCTION

4.8.1. The assessment of impacts arising from construction dust detailed within **Section 5.8, Chapter 5: Air Quality Part A** of the ES [**APP-040**] considers the potential impacts of all dust generating activities arising from construction of Part A. Inherent within the assessment methodology is the assumption that dust generating activities may occur at any location within the Order limits of Part A. Whilst there are changes to the Order limits of Part A with the Stabilisation Works (including the compensatory habitat), there are no additional receptors for dust impacts and therefore all impacts during construction remain unchanged.

4.9 DESIGN, MITIGATION AND ENHANCEMENT MEASURES

4.9.1. The mitigation requirements for Air Quality have not changed due to the Stabilisation Works. Therefore, the text within **Section 5.9, Chapter 5: Air Quality Part A** of the ES [**APP-040**] remains unchanged and valid. Additional mitigation measures are not required as a result of the Stabilisation Works.

4.10 ASSESSMENT OF LIKELY SIGNIFICANT EFFECTS

CONSTRUCTION

4.10.1. As set out within **Section 5.10, Chapter 5: Air Quality Part A** of the ES [**APP-040**], with the application of appropriate mitigation measures there are no significant effects expected as a result of Part A. This assessment would remain valid and unchanged with the Stabilisation Works.

4.11 MONITORING

4.11.1. The monitoring requirements for Air Quality have not changed due to the Stabilisation Works. Therefore, the text within **Section 5.11, Chapter 5: Air Quality Part A** of the ES [**APP-040**] remains unchanged and valid.

4.12 UPDATED DMRB GUIDANCE

4.12.1. Since the assessments in the ES were completed, the DMRB methodology was superseded and replaced with updated guidance as detailed in **Section 5.4, Chapter 5: Air Quality Part A** of the ES [**APP-040**]. An Air Quality DMRB sensitivity test for likely significant effects has been undertaken as detailed in **Appendix 5.8: Air Quality DMRB Sensitivity Test Part A** of the ES [**APP-205**], wherein it was determined that there would be a non-material change to the methodology of the assessment of construction dust as a result of the updated methodology. Therefore, there would be no change to the results of the assessment in this ES Addendum as a result of the updated DMRB guidance.

5 NOISE AND VIBRATION

5.1 INTRODUCTION

5.1.1. **Chapter 6: Noise and Vibration Part A** of the ES [**APP-042**] considers the likely significant effects of Part A on construction Noise and Vibration.

5.1.2. This section of the ES Addendum considers only the likely significant effects of the Stabilisation Works with respect to Noise and Vibration. As detailed in **Appendix B: Summary of Proposed Changes to Application** of this ES Addendum, the Stabilisation Works are not anticipated to have an impact on Noise and Vibration during operation and therefore this has not been considered in this chapter. The alignment of the Part A carriageway and traffic data would remain unchanged, therefore the operational stage assessment presented within the **Noise Addendum** [**REP1-019**] remains valid.

5.2 COMPETENT EXPERT EVIDENCE

5.2.1. The competent expert advice for the Noise and Vibration assessment has not changed for this assessment. Therefore, the text relating to Michael Ashcroft, Nicola Bolton and Steve Fisher within **Section 6.2, Chapter 6: Noise and Vibration Part A** of the ES [**APP-042**] remains unchanged and valid.

5.3 LEGISLATIVE AND POLICY FRAMEWORK

5.3.1. The legislative and policy framework for the Noise and Vibration assessment has not changed since the publication of the ES. Therefore, the text within **Section 6.3, Chapter 6: Noise and Vibration Part A** of the ES [**APP-042**] remains valid.

5.4 ASSESSMENT METHODOLOGY

5.4.1. In order to ensure a comparable assessment with the ES, the methodology followed for the construction Noise and Vibration assessment has not changed in response to the Stabilisation Works. Some additional construction plant is assumed to be required for Stabilisation Works and the details are discussed in **Section 5.8** of this ES Addendum. Therefore, the text within **Section 6.4, Chapter 6: Noise and Vibration Part A** of the ES [**APP-042**] remains valid.

5.5 ASSESSMENT ASSUMPTIONS AND LIMITATIONS

5.5.1. The assumptions and limitations for the construction Noise and Vibration assessment for the Stabilisation Works have not changed from the ES. As noted above some additional construction plant is assumed to be required for the Stabilisation Works and the details are discussed in **Section 5.8** of this ES Addendum. The text within **Section 6.5, Chapter 6: Noise and Vibration Part A** of the ES [**APP-042**] remains valid.

5.6 STUDY AREA

5.6.1. **Paragraph 6.6.4** within **Section 6.6, Chapter 6: Noise and Vibration Part A** of the ES [**APP-042**] states that the Construction Stage Study Area has been set at 300 m from the boundary of any construction activity associated with Part A. Given the Stabilisation Works require an extension to the Order limits of Part A, the Construction Stage Study Area (300 m from the boundary of any construction activity) has been extended to incorporate these

additional areas as shown in **Figure 3: Environmental Constraints** in **Appendix A: Figures** of this ES Addendum.

5.7 BASELINE CONDITIONS

5.7.1. The baseline for the Noise and Vibration assessment has not changed for the Stabilisation Works. Therefore, the text within **Section 6.7, Chapter 6: Noise and Vibration Part A** of the ES [**APP-042**] remains unchanged and valid. There are no additional receptors within the extended Construction Stage Study Area.

5.8 POTENTIAL IMPACTS

CONSTRUCTION

5.8.1. No significant adverse noise and vibration impacts are anticipated during the Stabilisation Works, as there are no receptors within the extended Construction Stage Study Area. Further details are provided below.

5.8.2. It is anticipated that the Stabilisation Works would be undertaken during the daytime, with only limited night-time working potentially required to form the access route for the works. The construction plant items anticipated to be used during the Stabilisation Works do not differ greatly from those associated with the bridge and underbridge construction activity (including piling) which is assumed to be undertaken in a similar area in the assessment within **Chapter 6: Noise and Vibration Part A** of the ES [**APP-042**]. In addition to the plant assumed for bridge construction (detailed within **Appendix 6.4: Source Information and Assumptions for Construction Noise Assessment Part A** of the ES **[APP-209**]) an additional crane, compaction equipment, dump trucks and dumpers may be used. Whilst these items would increase the predicted noise levels associated with the activity and lead to a larger significant observed adverse effect level (SOAEL) zone (the area within which the SOAEL is exceeded and significant impacts occur), significant impacts are not anticipated outside of the Construction Stage Study Area (300 m from construction works). As there are no receptors within 300 m of the Stabilisation Works, significant adverse impacts are not anticipated as a result of this activity.

5.8.3. The night-time works potentially required to form the access for the Stabilisation Works are likely to be less noisy than the Stabilisation Works themselves. The site access works are unlikely to require particularly different construction plant items assumed for other construction activities assessed in **Chapter 6: Noise and Vibration Part A** of the ES [**APP-042**]. As significant adverse impacts were not predicted outside of the 300 m Construction Stage Study Area for any of these activities, significant adverse impacts from these site access works are not anticipated.

5.8.4. In addition to the extension to the Order limits of Part A within the River Coquet valley itself, there is an additional extension to the Order limits of Part A to the south west of the River Coquet. Permanent land-take is required as compensatory habitat for the woodland to be removed from the Coquet River Felton Park LWS to facilitate the Stabilisation Works. It is expected that any construction works on the compensatory habitat land would be minimal, requiring limited mechanical plant and short in duration. Within the assessment of construction noise within **Chapter 6: Noise and Vibration Part A** of the ES [**APP-042**] it is assumed that the earthworks activity could take place anywhere within the Order limits of Part A (excluding easements). During the daytime the SOAEL zone for the earthwork's activity is 52 m. As there are no receptors within the 300 m Construction Stage Study Area

from the extension to the Order limits of Part A, significant adverse impacts are not anticipated.

5.8.5. **Table 6-26** within **Chapter 6: Noise and Vibration Part A** of the ES [**APP-042**] identifies the calculated SOAEL zone for construction vibration as a result of percussive piling as 160 m1. This calculation is a likely worst-case as there are other piling methods available which produce lower levels of vibration. There are no receptors within 160 m of the proposed piling locations for the Stabilisation Works and therefore, significant adverse construction vibration impacts are not anticipated.

5.8.6. All other impacts during construction, detailed within **Section 6.8, Chapter 6: Noise and Vibration Part A** of the ES [**APP-042**], remain unchanged and valid.

5.9 DESIGN, MITIGATION AND ENHANCEMENT MEASURES

5.9.1. The construction mitigation measures detailed within **Section 6.9, Chapter 6: Noise and Vibration Part A** of the ES [**APP-042**] remain unchanged and valid. Additional mitigation measures are not required as a result of the Stabilisation Works.

5.10 ASSESSMENT OF LIKELY SIGNIFICANT EFFECTS

CONSTRUCTION

5.10.1. The assessment of likely significant effects for Noise and Vibration has not changed due to the Stabilisation Works. Therefore, the text within **Section 6.10, Chapter 6: Noise and Vibration Part A** of the ES [**APP-042**], remains unchanged and valid.

5.11 MONITORING

5.11.1. The monitoring requirements for Noise and Vibration during the construction stage have not changed due to the Stabilisation Works. Therefore, the text within **Section 6.11, Chapter 6: Noise and Vibration Part A** of the ES [**APP-042**] remains unchanged and valid.

5.12 UPDATED DMRB GUIDANCE

5.12.1. Since the assessments in the ES were completed, the DMRB methodology was superseded and replaced with updated guidance in the form of DMRB LA 111 Noise and Vibration Revision 2 (LA 111).

5.12.2. The methodology used to undertake the construction Noise and Vibration assessments detailed within **Section 6.4, Chapter 6: Noise and Vibration Part A** of the ES [**APP-042**] is sufficiently similar to that presented within LA 111 that the potential for changes to the conclusions of the construction stage assessments is considered to be low.

[1] It is noted that this distance is outside of the prediction range for the calculation of vibration levels generated by percussive piling. However, the calculated distance has not been limited in order to present a worst-case approach at this stage. Refer to **Table 6-26** within **Chapter 6: Noise and Vibration Part A** of the ES **[APP-042]** for further details.

6 LANDSCAPE AND VISUAL

6.1 INTRODUCTION

6.1.1. **Chapter 7: Landscape and Visual Part A** of the ES [**APP-044**] considers the likely significant effects of Part A on Landscape and Visual.

6.1.2. This section of the ES Addendum considers only the likely significant effects of the Stabilisation Works on Landscape and Visual.

6.2 COMPETENT EXPERT EVIDENCE

6.2.1. As detailed in **Table 6-1**, the professionals contributing to the production of this assessment have sufficient expertise to ensure the completeness and quality of this assessment. The table sets out the details of expertise where this is different to those presented in the ES.

Table 6-1 – Landscape and Visual Professional Competence

Name	Role	Qualifications and Professional Membership	Experience
Sophie Lewis	Author	BA (Hons) Landscape Architecture MA Landscape Architecture CMLI (Chartered member of the Landscape Institute)	Senior Landscape Architect Chartered member of the Landscape Institute, with over five years of project experience. Project experience includes responsibility for Landscape Visual Impact Assessments and design inputs for a diverse range of schemes including: – Spalding Western Relief Road, Sections 1 and 5 – M1 Junction 19 Improvement scheme
Andrew Williams	Reviewer	BA (Hons) Landscape Architecture Grad Dip Landscape Architecture CMLI	Technical Director Over 20 years' experience of landscape architecture with a focus on highways. Preparation of and review of Landscape and Visual Impacts Assessments, including: – A1 Birtley to Coal House – A31 Magherafelt bypass – Lincoln Eastern By-pass

6.3 LEGISLATIVE AND POLICY FRAMEWORK

6.3.1. The legislative and policy framework for Landscape and Visual has not changed since the publication of the ES. Therefore, the text within **Section 7.3, Chapter 7: Landscape and Visual Part A** of the ES [**APP-044**] remains valid.

6.4 ASSESSMENT METHODOLOGY

6.4.1. In order to ensure a comparable assessment with the ES, the assessment methodology followed for Landscape and Visual has not changed in response to the proposed Stabilisation Works. Therefore, the text within **Section 7.4, Chapter 7: Landscape and Visual Part A** of the ES [**APP-044**] remains unchanged and valid.

6.5 ASSESSMENT ASSUMPTIONS AND LIMITATIONS

6.5.1. The assessment assumptions and limitations for Landscape and Visual for the Stabilisation Works has not changed from **Section 7.5, Chapter 7: Landscape and Visual Part A** of the ES [**APP-044**], with the exception that:

a. Within the areas required for the Stabilisation Works to the north of the River Coquet, all woodland would be removed (405 m^2 to the west, and 2,400 m^2 to the east of the existing A1 bridge crossing);

b. Lifting equipment comprising cranes would be required for the duration of the construction period of six months and that clearance operations would be undertaken at the commencement of the construction period; and

c. Replacement mitigation woodland planting and compensatory habitat would be planted at the same time as the landscape mitigation proposals as set out on **Figure 7.8: Landscape Mitigation Masterplan Part A** of the ES [**REP3-008**] (submitted at Deadline 4) and would therefore establish over a similar timeframe. Therefore, the remaining text **within Section 7.5, Chapter 7: Landscape and Visual Part A** of the ES [**APP-044**] remains unchanged and valid. The **Landscape Mitigation Masterplan Part A for Change Request** has been submitted at Deadline 4.

6.6 STUDY AREA

6.6.1. The study area for the Landscape and Visual assessment has not materially changed for the Stabilisation Works, the 2 km buffer extending from the centre line of the Scheme. Therefore, the text within **Section 7.6, Chapter 7: Landscape and Visual Part A** of the ES [**APP-044**] remains unchanged and valid.

6.7 BASELINE CONDITIONS

6.7.1. The baseline for the Landscape and Visual assessment has not changed for the Stabilisation Works. Therefore, the text within **Section 7.7, Chapter 7: Landscape and Visual Part A** of the ES [**APP-044**] remains unchanged and valid, and no new receptors have been identified.

6.8 POTENTIAL IMPACTS

VISUAL

Construction

6.8.1. The potential visual impacts, and specifically those viewpoints and visual receptors that currently experience views of the River Coquet valley are anticipated to change. During construction, the anticipated additional impacts of the Stabilisation Works, over and above those that identified in **Section 7.8, Chapter 7: Landscape and Visual Part A** of the ES [**APP-044**] are outlined below.

6.8.2. For the residents of Receptor 27 (Hemelspeth) to the south-west of Felton (refer to **Figure 7.6: Visual Effects Drawings Residential Properties Part A** of the ES [**APP-093**]) with views orientated to the west and north-west, potential impacts would arise as a result of:

a. A marginal increase in the area of woodland impacted and of activity associated with the construction of the River Coquet bridge, beyond the existing woodland in the foreground, some of which would be removed by the Stabilisation Works.

6.8.3. For the users of Public Rights of Way (PRoW) to the south side of the River Coquet and with views to the north (Footpath 422/020 and Footpath 422/002) and associated viewpoints 18 and 19, south of the River Coquet, potential impacts would arise as a result of:

a. The awareness of the removal of an additional area of the existing woodland from the north side of the River Coquet valley at a distance of approximately 100-150 m. Totalling 405 m^2 to the west, and 2,400 m^2 to the east of the existing A1 bridge crossing;

b. The presence of additional land stabilisation activity in the form of sheet piling and erosion control measures, and associated plant, representing a larger working footprint (additional 2,805 m^2).

6.8.4. For the users of the PRoW to the north side of the River Coquet and with views to the south (St Oswald's Way) and associated viewpoints 21 and 24, north of the River Coquet, potential impacts would arise as a result of:

a. The awareness of the removal of an additional area of the existing woodland from the north side of the River Coquet valley at a distance of approximately 0-50 m. Totalling 405 m^2 to the west, and 2,400 m^2 to the east of the existing A1 bridge crossing;

b. The presence of additional land stabilisation activity, including erosion control measures, in close proximity, in the form of sheet piling, and associated plant, representing a larger working footprint (additional 2,805 m^2).

6.8.5. For the users of PRoW to the south side of the River Coquet and with views to the south along the A1 corridor (Footpath 422/020 and Footpath 422/002) and associated viewpoint 20, south of the River Coquet, potential impacts would arise as a result of:

a. The awareness of the additional mitigation planting within the compensatory habitat to the south-west, on the edge of the proposed cutting slope.

6.8.6. All other landscape and visual impacts during construction, detailed within **Section 7.8, Chapter 7: Landscape and Visual Part A** of the ES [**APP-044**], remain unchanged are valid.

Operation

6.8.7. The potential visual impacts, and specifically those viewpoints and visual receptors that currently experience views of the River Coquet valley are anticipated to change for some. During operation, the anticipated additional impacts of the Stabilisation Works, over and above those that identified in **Chapter 7: Landscape and Visual Part A** of the ES [**APP-044**] are outlined below.

6.8.8. For the residents of Receptor 27 (Hemelspeth) to the south-west of Felton (refer to **Figure 7.6: Visual Effects Drawings Residential Properties Part A** of the ES [**APP-093**]) with views orientated to the west and north-west, potential impacts would arise as a result of:

a. The gradual restoration in the woodland cover as woodland within the valley re-establishes, would be screened in summer months by the existing woodland in the foreground.

6.8.9. For the users of PRoW to the south side of the River Coquet and with views to the north (Footpath 422/020 and Footpath 422/002) and associated viewpoints 18 and 19, south of the River Coquet, potential impacts would arise as a result of:

a. In winter Year (Yr) 1 and prior to the re-establishment of woodland, the awareness of the absence of existing woodland from the north side of the River Coquet valley at a distance of approximately 100-150 m, removed during construction, would remain. Totalling 405 m^2 to the west, and 2,400 m^2 to the east of the existing A1 bridge crossing;

b. In winter Yr 1 and prior to the re-establishment of woodland, the awareness of the erosion protection measures on the north bank would be visible from elevated locations looking into the valley; and

c. In the summer Yr 15 the establishment of the mitigation planting would substantially restore the wooded characteristics of the River Coquet valley, limiting visibility of the interventions on the north side of the river.

6.8.10. For the users of the PRoW to the north side of the River Coquet and with views to the south (St Oswald's Way) and associated viewpoints 21 and 24, north of the River Coquet, potential impacts would arise as a result of:

a. In winter Yr 1 and prior to the re-establishment of woodland, the awareness of the absence of existing woodland from the north side of the River Coquet valley at a distance of approximately 0-50 m, removed during construction, would remain. Totalling 405 m^2 to the west, and 2,400 m^2 to the east of the existing A1 bridge crossing

b. In the summer Yr 15 the establishment of the mitigation planting would substantially restore the wooded characteristics of the River Coquet valley.

6.8.11. For the users of PRoW to the south side of the River Coquet and with views to the south along the A1 corridor (Footpath 422/020 and Footpath 422/002) and associated viewpoint 20, south of the River Coquet, potential impacts would arise as a result of:

a. The awareness of the additional mitigation planting within the compensatory habitat to the south-west, on the edge of the proposed cutting slope.

6.8.12. All other landscape and visual impacts during construction, detailed within **Section 7.8**, **Chapter 7: Landscape and Visual Part A** of the ES [**APP-044**], remain unchanged are valid.

6.9 DESIGN, MITIGATION AND ENHANCEMENT MEASURES

6.9.1. In addition to the measures detailed within **Section 7.9, Chapter 7: Landscape and Visual Part A** of the [**APP-044**], the following mitigation measures would be implemented.

CONSTRUCTION

6.9.2. As outlined in **Appendix E: Register of Environmental Actions and Commitments** of this ES Addendum, during the construction phase, the following additional mitigation measures would be included:

a. The partial re-planting of woodland within the areas (405 m^2 to the west, and 2,400 m^2 to the east of the existing A1 bridge crossing) which would be subject to vegetation removal during the construction period. This would be constrained by the need for offsets from above and below ground structures meaning that not all existing woodland planting would be replaced; and

b. The planting of an additional 3.1 hectares of woodland (compensatory habitat), to replace 0.28 hectares of broadleaved woodland lost within the Coquet River Felton Park LWS, to be provided in addition to the Woodland Creation Area set out in the revised **Ancient Woodland Strategy Part A for Change Request** (submitted at Deadline 4). The additional planting would be located to the south of the existing ancient woodland to the south of the River Coquet as shown in in **Figure 2: Location Plan and Compensatory Habitat Location** in **Appendix A** of this ES Addendum. This would require additional permanent land-take.

6.9.3. The Landscape Mitigation Masterplan Part A for Change Request has been submitted at Deadline 4.

OPERATION

6.9.4. No additional mitigation measures for the Stabilisation Works have been identified as being required during the operational phase of the revised Scheme.

6.10 ASSESSMENT OF LIKELY SIGNIFICANT EFFECTS

VISUAL

6.10.1. As set out in **Section 6.8** of this ES Addendum, the additional impacts of the Stabilisation Works would be limited to the following recreational receptors and associated viewpoints:

Residential Receptor

a. The residents of Receptor 27 (Hemelspeth)

Recreational Receptors:

a. Users of Footpath 422/020;
b. Users of Footpath 422/002; and
c. Users of Footpath St Oswald's Way (115/009).

Viewpoints:

a. Viewpoint 18: View looking north-west from PRoW (422/020);
b. Viewpoint 19: View looking north from PRoW (422/020);
c. Viewpoint 20: View looking south from PRoW (422/020)
d. Viewpoint 21: View looking south-west from St Oswald's Way (115/009);
e. Viewpoint 24: View looking west from St Oswald's Way (115/009).

CONSTRUCTION

6.10.2. The detailed visual assessment of the potential impacts at construction stage of the Stabilisation Works is set out in **Appendix C: Visual Effects Schedule** of this ES Addendum and detailed below:

6.10.3. For the residents of Receptor 27 (Hemelspeth) to the south-east of the River Coquet, the intervening distance and retention of the majority of the woodland associated with the River Coquet valley would result in no change to the findings of the assessment in **Appendix 7.3: Residential Visual Effects Schedule - Part A** of the ES [**APP-218**].

6.10.4. For the users of PRoW to the south side of the River Coquet and with views to the north (Footpath 422/020 and Footpath 422/002) and associated viewpoints 18 and 19, south of the River Coquet, the magnitude of impact and resulting effects during construction of the Stabilisation Works would not change from those identified in **Appendix 7.2: Viewpoints Visual Effects Schedule Part A** of the ES [**APP-217**] and **Appendix 7.4: Public Rights of Way Visual Effects Schedule Part A** of the ES [**APP-219**].

6.10.5. For the users of PRoW to the south side of the River Coquet with views to the south along the A1 corridor (Footpath 422/020 and Footpath 422/002) and associated viewpoint 20, south of the River Coquet the effects during construction of the Stabilisation Works would not change from those identified in **Appendix 7.4: Public Rights of Way Visual Effects Schedule Part A** of the ES [**APP-219**] in relation to the PRoW and **Appendix 7.2: Viewpoints Visual Effects Schedule Part A** of the ES [**APP-217**] in relation to the viewpoints.

6.10.6. For the users of PRoW to the north side of the River Coquet and with views to the south (St Oswald's Way (PRoW 115/009)) and associated viewpoints 21 and 24 north of the River Coquet, potential impacts of the additional woodland clearance would not give rise to a perceptible increase in the magnitude of impact. The additional clearance would be most perceptible within views that are closest to the works or associated with the footpath diversion of St Oswald's Way, and associated with Viewpoint 24; the major magnitude of impact and Large Adverse significant of effect (significant) identified within **Appendix 7.4: Public Rights of Way Visual Effects Schedule Part A** of the ES [**APP-219**], would be unchanged. For locations along St Oswald's Way to the east and west of the proposed River Coquet crossing, the magnitude of impact and resulting effects during construction of the Stabilisation Works would not change from those identified in **Appendix 7.2: Viewpoints Visual Effects Schedule Part A** of the ES [**APP-217**] in relation to the viewpoint 21 and **Appendix 7.4: Public Rights of Way Visual Effects Schedule Part A** of the ES [**APP-219**] in relation to the PRoW.

OPERATION

6.10.7. The visual assessment of the potential impacts of the Stabilisation Works at the operation stage of the revised Scheme are set out in **Appendix C: Visual Effects Schedule** of this ES Addendum and detailed below:

6.10.8. For the residents of Receptor 27 (Hemelspeth) to the south-east of the River Coquet, the intervening distance and retention of the majority of the woodland associated with the River Coquet valley would result in no change to the findings of the assessment in **Appendix 7.3: Residential Visual Effects Schedule - Part A** of the ES [**APP-218**].

6.10.9. For the users of the PRoW to the south side of the River Coquet and with views to the north (Footpath 422/020 and Footpath 422/002) and associated viewpoints 18 and 19, south of the River Coquet, the magnitude of impact and resulting effects during operation of the revised Scheme as a result of the Stabilisation Works would change from those identified in **Appendix 7.4: Public Rights of Way Visual Effects Schedule Part A** of the ES [**APP-219**] in relation to the PRoW and **Appendix 7.2: Viewpoints Visual Effects Schedule Part A** of the ES [**APP-217**] in relation to the viewpoint.

a. The users of PRoW 422/020 and associated Viewpoint 18 would be subject to a slight increase in the magnitude of impact, increasing in the summer yr. 15 from no change to minor, the resulting significance of effect increasing from neutral to Slight Adverse (non-significant).
b. The users of PRoW 422/002 and associated Viewpoint 19 would be subject to a slight increase in the magnitude of impact, the beneficial impact previously identified becoming adverse, resulting in a Slight Adverse significance of effect in winter Yr. 1. Similarly, for summer Yr. 15 the beneficial impact previously identified would become adverse and the minor magnitude of impact would result in a Slight Adverse significance of effect (non-significant).

6.10.10. The users of PRoW to the south side of the River Coquet and with views to the south associated with the A1 corridor, and the diversion of Footpath 422/020 and Footpath 422/002, and associated viewpoint 20, the magnitude of impact during operation of the revised Scheme as a result of the Stabilisation Works, would change from those identified in **Appendix 7.4: Public Rights of Way Visual Effects Schedule Part A** of the ES [**APP-219**] in relation to the PRoW and **Appendix 7.2: Viewpoints Visual Effects Schedule Part A** of the ES [**APP-217**] in relation to the viewpoint. As the orientation of the view would be changed and there would be greater awareness of the cleared woodland to the north, following construction. Therefore, the PRoW (Footpath 422/020 and Footpath 422/002) and Viewpoint 20 would be subject to a slight increase in the magnitude of impact, the beneficial impact previously identified becoming adverse, resulting in a Slight Adverse significance of effect in winter Yr. 1. Similarly, for summer Yr. 15 the beneficial impact previously identified would become adverse and the minor magnitude of impact would result in a Slight Adverse significance of effect (non-significant).

6.10.11. Away from the footpath diversion and west of the A1, views from the PRoW (Footpath 422/002) remain to the south and the compensatory habitat to the south side of the Woodland Creation Area would not be readily perceived upon planting and in the subsequent winter of Yr. 1 and would be screened from view as the planting establishes in summer Yr. 15.

6.10.12. For the users of PRoW to the north side of the River Coquet and with views to the south (St Oswald's Way (Footpath 115/009)) and associated viewpoints 21 and 24, north of the River Coquet, potential impacts would rise to a perceptible increase in the magnitude of impact from the diversion of St Oswald's Way (Footpath 115/009) and for Viewpoint 24. The proximity to the cleared areas of woodland from the Coquet River Felton Park LWS resulting in the magnitude of impact increasing in winter Yr. 1, from minor to moderate for St Oswald's Way (Footpath 115/009) and Viewpoint 24, resulting in the significance of effect increasing from moderate adverse (significant) to Large Adverse (significant). For St Oswald's Way (Footpath 115/009) and Viewpoint 24, the magnitude of impact in the summer Yr. 15 would also increase marginally, from no change to minor, and the significance of effect would also increase from no change to Slight Adverse (non-significant).

6.10.13. For locations along St Oswald's Way to the east of the proposed River Coquet crossing associated with Viewpoint 21, the intervening woodland would substantially reduce the impact of the woodland removal from the Coquet River Felton Park LWS, and the magnitude of impact is unlikely to change from that identified in **Appendix 7.2 Viewpoints Visual Effects Schedule Part A** of the ES [**APP-217**].

6.11 MONITORING

6.11.1. The monitoring requirements for Landscape and Visual have not changed due to the Stabilisation Works. Therefore, the text within **Section 7.11, Chapter 7: Landscape and Visual Part A** of the ES [**APP-044**] remains unchanged and valid.

6.12 UPDATED DMRB GUIDANCE

6.12.1. Since the assessments in the ES were completed, the DMRB methodology was superseded and replaced with updated guidance as detailed in **Section 7.4, Chapter 7: Landscape and Visual Part A** of the ES [**APP-044**]. A DMRB sensitivity test for likely significant effects has been undertaken, that identified that changes to the sensitivity of some receptors would be higher, and that less focus would be given to individual receptors, instead the focus would be on the effects on settlements/communities. The findings of the sensitivity test presented in **Chapter 7: Landscape and Visual Part A** of the ES [**APP-044**] are valid for the assessment in this ES Addendum, meaning there would be no material change to the assessment outlined above.

7 CULTURAL HERITAGE

7.1 INTRODUCTION

7.1.1. **Chapter 8: Cultural Heritage Part A** of the ES **[APP-046]** considers the likely significant effects of Part A on Cultural Heritage. This comprises buried heritage assets (archaeological remains) and above ground heritage assets (structures and landscapes of heritage interest) within or immediately around Part A. It also considers the impact of Part A on historic character and setting of designated assets within and beyond Part A (e.g. views to and from listed buildings and conservation areas).

7.1.2. This section of the ES Addendum considers only the likely significant effects of the Stabilisation Works on Cultural Heritage.

7.2 COMPETENT EXPERT EVIDENCE

7.2.1. As detailed in **Table 7-1**, the professionals contributing to the production of this assessment have sufficient expertise to ensure the completeness and quality of this assessment. The table sets out the details of expertise where this is different to those presented in the ES.

Table 7-1 – Cultural Heritage Professional Competence

Name	Role	Qualifications and Professional Membership	Experience
Alexandra Grassam	Author	BA (Hons) Archaeology and Prehistory MSc Professional Archaeology Member of the Chartered Institute for Archaeologists (MCIfA)	Principal Consultant 17 years professional experience in impact assessment. Other recent relevant experience includes: - Lead specialist for the Great Yarmouth River Crossing Development Consent Order application - Lead specialist for the Spalding Relief Road Environmental Impact Assessment
Natasha Powers	Reviewer	BSc (Hons) Archaeological Science MSc Osteology, Palaeopathology and Funerary Archaeology Fellow of the Society of Antiquaries (FSA)	Associate Director 25 years professional experience managing heritage projects in Scotland and England. Other recent relevant experience includes: - Project Manager/Specialist Consultant for Lincoln Cathedral Connected Project - Specialist Consultant for HS2

Name	Role	Qualifications and Professional Membership	Experience
			- Project Manager, Triton Knoll Offshore Windfarm

7.3 LEGISLATIVE AND POLICY FRAMEWORK

7.3.1. The legislative and policy framework for Cultural Heritage has not changed since the publication of the ES. Therefore, the text within **Section 8.3, Chapter 8: Cultural Heritage Part A** of the ES [**APP-046**] remains valid.

7.4 ASSESSMENT METHODOLOGY

7.4.1. In order to ensure a comparable assessment with the ES, the assessment methodology followed for Cultural Heritage has not changed in response to the Stabilisation Works. Therefore, the text within **Section 8.4, Chapter 8: Cultural Heritage Part A** of the ES [**APP-046**] remains unchanged and valid.

7.5 ASSESSMENT ASSUMPTIONS AND LIMITATIONS

7.5.1. The assessment assumptions and limitations for Cultural Heritage for the Stabilisation Works north of the River Coquet have not changed from the ES. Therefore, the text within **Section 8.5, Chapter 8: Cultural Heritage Part A** of the ES [**APP-046**] remains unchanged and valid.

7.6 STUDY AREA

7.6.1. The Study Areas for the Cultural Heritage assessment has been extended to include the expansion in Order limits of Part A (i.e. 500 m and 1 km from the Order limits of Part A) as shown on **Figure 3: Environmental Constraints** in **Appendix A: Figures** of this ES Addendum.

7.7 BASELINE CONDITIONS

7.7.1. The increase in the Order limits of Part A has resulted in the extension of the inner (500 m) and outer (1 km) Study Areas around the River Coquet. As a result, there is now one additional heritage asset, increasing the number from 149 (as reported in **Section 8.7, Chapter 8: Cultural Heritage Part A** of the ES [**APP-046**]) to 150 as shown in **Figure 3: Environmental Constraints** in **Appendix A: Figures** of this ES Addendum. They comprise 64 designated assets and 86 non-designated heritage assets (previously reported as 85). The additional non-designated heritage asset identified within the inner Study Area as a result of the increase to the Order Limits of Part A is the site of a now demolished World War II Pill Box (HER 11364), located approximately 490 m to the west of Part A Order limits. The asset is of low value. Due to its distance from Part A, it would not be subject to impacts during construction or operation of Part A.

7.7.2. While no additional below ground heritage assets are located within the Stabilisation Works and within the area required for the compensatory habitat, there is, however, a potential for

currently unknown below ground heritage assets to be located within the extended Order limits of Part A.

7.7.3. At the River Coquet, a large collection of work flints of prehistoric date are reported to have been collected (HER 11368). The location of the find spots is not precisely recorded but is shown approximately 10 m to the east of Part A, on the south bank of the River Coquet, and may be evidence for prehistoric activity in or close by this location. Where present, below ground remains of prehistoric date are anticipated to be up to medium value.

7.8 POTENTIAL IMPACTS

CONSTRUCTION

7.8.1. During construction, the anticipated impacts of the Stabilisation Works are the additional loss of currently unknown below ground heritage assets located within the extended Order limits of Part A. The impacts would arise from construction activities such as ground levelling, topsoil stripping, pilling, temporary haul roads and landscape planting. All impacts would be permanent direct adverse in nature.

7.8.2. All other impacts during construction, detailed within **Section 8.8, Chapter 8: Cultural Heritage Part A** of the ES [**APP-046**], remain unchanged and valid.

OPERATION

7.8.3. All impacts during operation, detailed within **Section 8.8, Chapter 8: Cultural Heritage Part A** of the ES [**APP-046**], remain unchanged and valid.

7.9 DESIGN, MITIGATION AND ENHANCEMENT MEASURES

7.9.1. All measures during construction and operation of Part A, detailed within **Section 8.9, Chapter 8: Cultural Heritage Part A** of the [**APP-046**], remain unchanged and valid. Additional mitigation measures are not required as a result of the Stabilisation Works.

7.10 ASSESSMENT OF LIKELY SIGNIFICANT EFFECTS

CONSTRUCTION

7.10.1. There is a potential for additional direct adverse impacts on currently unknown below-ground heritage assets due to the Stabilisation Works and compensatory habitat area, including those of prehistoric date. The value of the heritage assets is currently unknown but could range in value from low to medium. Where present, the magnitude of impact after preservation by record would be moderate adverse. The effects would be Moderate Adverse (significant) for medium value assets and Slight Adverse (not significant) for low value assets, as previously report within **Section 8.10, Chapter 8: Cultural Heritage Part A** of the ES [**APP-046**].

OPERATION

7.10.2. All likely significant effects in operation of Part A, detailed within **Section 8.10, Chapter 8: Cultural Heritage Part A** of the ES [**APP-046**], remain unchanged and valid.

7.11 MONITORING

7.11.1. The monitoring requirements for Cultural Heritage have not changed due to the Stabilisation Works. Therefore, the text within **Section 8.11, Chapter 8: Cultural Heritage Part A** of the ES [**APP-046**] remains unchanged and valid.

7.12 UPDATED DMRB GUIDANCE

7.12.1. Since the assessments in the ES were completed, the DMRB methodology was superseded and replaced with updated guidance as detailed in **Section 8.4, Chapter 8: Cultural Heritage Part A** of the ES [**APP-046**]. As detailed in Chapter 8: Cultural Heritage Part A of the ES [APP-046], a DMRB sensitivity test for likely significant effects has been undertaken to determine whether the Study Areas applied remained appropriate and if the value of any heritage assets required amending (in particular Grade II Listed Buildings). The findings of the sensitivity test presented in **Chapter 8: Cultural Heritage Part A** of the ES [**APP-046**] are valid for the assessment in this Addendum, meaning there would be no material change to the assessment outlined above.

8 BIODIVERSITY

8.1 INTRODUCTION

8.1.1. **Chapter 9: Biodiversity Part A** of the ES [**APP-048**] considers the likely significant effects of Part A on Biodiversity.

8.1.2. This section of the ES Addendum considers only the likely significant effects of the Stabilisation Works on Biodiversity.

8.1.3. As detailed in **Appendix B: Summary of Proposed Changes to Application** of this ES Addendum, the Stabilisation Works are not anticipated to have an impact on operational air quality and nitrogen deposition levels, and therefore this has not been considered in this chapter.

8.2 COMPETENT EXPERT EVIDENCE

8.2.1. As detailed in **Table 8-1**, the professional contributing to the production of this assessment has sufficient expertise to ensure the completeness and quality of this assessment. The table sets out the details of expertise where this is different to those presented in the ES.

Table 8-1 - Biodiversity Professional Competence

Name	Role	Qualifications and Professional Membership	Experience
Dr Mark Webb	Reviewer / Approver	Bachelor of Science (Honours) Doctor of Philosophy Chartered Ecologist and Fellow of the Chartered Institute of Ecology and Environmental Management (FCIEEM) Chartered Environmentalist with Society for the Environment (CEnv)	Director >20 years' experience in ecological consultancy, particularly in relation to major infrastructure. Particular skills and experience in ecological impact assessment. Lead author for Highways England's Highways Biodiversity Plan.

8.3 LEGISLATIVE AND POLICY FRAMEWORK

8.3.1. The legislative and policy framework for Biodiversity has not changed since the publication of the ES. Therefore, the text within **Section 9.3, Chapter 9: Biodiversity Part A** of the ES [**APP-048**] remains valid.

8.4 ASSESSMENT METHODOLOGY

8.4.1. In order to ensure a comparable assessment with the ES, the assessment methodology followed for Biodiversity has not changed in response to the Stabilisation Works. Therefore, the text within **Section 9.4, Chapter 9: Biodiversity Part A** of the ES [**APP-048**] remains unchanged and valid.

8.5 ASSESSMENT ASSUMPTIONS AND LIMITATIONS

8.5.1. The assessment assumptions and limitations for Biodiversity for the Stabilisation Works have not changed from the ES. Therefore, the text within **Section 9.5, Chapter 9: Biodiversity Part A** of the ES [**APP-048**] remains unchanged and valid.

8.6 STUDY AREA

8.6.1. The Stabilisation Works result in the extension of the Order Limits of Part A. However, the Study Area for the Biodiversity assessment has not changed for the Stabilisation Works and is considered valid for the assessment in this ES Addendum. Therefore, the text within **Section 9.6, Chapter 9: Biodiversity Part A** of the ES [**APP-048**] remains unchanged and valid.

8.7 BASELINE CONDITIONS

8.7.1. The baseline for the Biodiversity assessment has not changed for the Stabilisation Works. Therefore, the text within **Section 9.7, Chapter 9: Biodiversity Part A** of the ES [**APP-048**] remains unchanged and valid.

8.8 POTENTIAL IMPACTS

8.8.1. Potential impacts are presented below for those ecological receptors that may be impacted by the Stabilisation Works. Potential impacts for all other ecological receptors, detailed within **Section 9.8** and summarised in **Table 9-21**, **Chapter 9: Biodiversity Part A** of the ES [**APP-048**], remain unchanged and valid.

8.8.2. Whilst the River Coquet represents a Habitat of Principal Importance (HPI), the flora and fauna of the river are qualifying features of the River Coquet and Coquet Valley SSSI. As such, impacts to the river habitat have been assessed as part of the impact assessment of the SSSI.

8.8.3. Impacts to European sites for nature conservation are not discussed within this Addendum and have been assessed within an Updated Habitats Regulations Assessment (HRA) Report for Change Request issued at Deadline 4.

CONSTRUCTION

8.8.4. During construction, the potential impacts of the Stabilisation Works are:

River Coquet and Coquet Valley Woodlands SSSI – River Course

a. Permanent damage or degradation of watercourse due to changes in water chemistry (in relation to materials used);
b. Permanent loss of riverbank habitat as a result of construction of the permanent scour protection;
c. Temporary damage of in-river habitat during the installation of temporary river training measures;
d. Temporary, indirect damage or degradation of watercourse due to potential pollution event and silt run-off during installation of temporary river training measures, permanent scour protection and installation of erosion protection measures on the northern bank; and

e. Temporary indirect impacts (such as noise, dust, light, vibration).

Coquet River Felton Park Local Wildlife Site (LWS)

a. Permanent, direct loss of 0.28ha of woodland habitat (whilst it is proposed to replant the area post-construction, the loss is considered permanent as the habitat is adopted as ancient woodland, an irreplaceable habitat, for the purpose of mitigation);
b. Temporary direct and indirect damage to retained LWS woodland;
c. Temporary indirect impacts (such as noise, dust, light, vibration, compaction) to retained LWS woodland.

Great Crested Newts

a. Temporary, direct loss of terrestrial habitat (approximately 0.04 ha of broadleaved, semi-natural woodland to the west of the A1 carriageway) within proximity to a known great crested newt pond (pond A19);
b. Direct mortality of individual newts during site clearance, due to entrapment in voids/trenches or due to vehicle movements; and
c. Temporary indirect disturbance (noise, dusk, light, vibration, visual).

Breeding Birds

a. Temporary, direct loss of suitable nesting habitat; and
b. Temporary indirect disturbance (noise, dusk, light, vibration, visual).

Otter

a. Reduction in foraging success due to permanent damage or degradation of watercourse that may affect fish populations; and
b. Temporary indirect disturbance and displacement should otter be present along the River Coquet (noise, dust, light, vibration, visual).

Fish

a. Permanent reduction in population due to damage or degradation of watercourse resulting from changes in water chemistry (in relation to materials used);
b. Permanent loss of bankside habitat, which may be used by juvenile fish, as a result of the permanent scour protection;
c. Temporary loss of habitat during installation of river training measures;
d. Temporary obstruction to the passage of migratory fish as a result of the temporary river training measures;
e. Temporary, indirect damage or degradation of watercourse due to potential pollution event and silt run-off during installation of temporary river training measures, permanent scour protection and installation of erosion protection measures on the northern bank; and
f. Temporary indirect disturbance (such as noise, light, vibration, visual).

Aquatic invertebrates

a. Permanent reduction in population due to damage or degradation of watercourse resulting from changes in water chemistry (in relation to materials used);
b. Temporary reduction in population due to mortality from the construction of river training measures;
c. Permanent loss of bankside habitat as a result of the permanent scour protection;
d. Temporary loss of river habitat during installation of river training measures; and
e. Temporary, indirect damage or degradation of watercourse due to potential pollution event and silt run-off during installation of temporary river training measures permanent scour protection and installation of erosion protection measures on the northern bank.

OPERATION

8.8.5. Following consultation with Natural England and the Environment Agency, impacts identified and assessed for the operational phase comprise adverse impacts to the River Coquet (SSSI and HPI) from materials of the scour protection entering the watercourse and impacts on biodiversity due to permanent changes in morphology.

8.8.6. The release of materials from the scour protection may occur during flood events or following natural degrading of the scour protection over its lifespan. This has also been considered with regards to otter, fish and aquatic invertebrates, which are reliant on the health of the watercourse.

8.8.7. All other impacts during operation of Part A, detailed within **Section 9.8, Chapter 9: Biodiversity Part A** of the ES [**APP-048**], remain unchanged and valid.

8.9 DESIGN, MITIGATION AND ENHANCEMENT MEASURES

8.9.1. In addition to the measures detailed within **Section 9.9, Chapter 9: Biodiversity Part A** of the ES [**APP-048**], the following mitigation measures would be implemented.

CONSTRUCTION

8.9.2. The temporary river training measures and permanent scour protection would be constructed using suitable materials to avoid changes in water chemistry, such as the use of washed stone or inert materials. This measure is captured in **Appendix E: Register of Environmental Actions and Commitments** of this ES Addendum.

8.9.3. A site-specific drainage management plan would be created to attenuate, treat and discharge site runoff. In-channel silt barriers (i.e. silt curtains or similar) would be deployed as far as reasonably practical or a similar form of barrier if silt water runoff is discharging into the River Coquet to control the downstream dispersion of suspended solids. Further, a suitable geomembrane would be installed between the river training works and piling platform (to form the piles in the north bank of the River Coquet) to minimise the release of construction aggregate associated with the piling platform. This measure is captured in **Appendix E: Register of Environmental Actions and Commitments** of this ES Addendum.

8.9.4. An assessment of the biological water quality and water chemistry would be undertaken prior to and during construction to monitor the river during the Stabilisation Works. The main contractor would monitor and take appropriate action if water quality deteriorates, following

agreement with Natural England and the Environment Agency where required (for example where a permit or licence is in place with conditions/restrictions). The monitoring would asses pH, suspended solids, Biochemical Oxygen Demand (BOD) and Chemical Oxygen Demand (COD). The methodology of the monitoring would be determined at detailed design and captured within a monitoring and management strategy for the Stabilisation Works. The monitoring and management strategy is captured in **Appendix E: Register of Environmental Actions and Commitments** of this ES Addendum.

8.9.5. To protect fish, particularly migratory salmon *Salmo salar* and brown trout *Salmo trutta*, mitigation measures EM014 and EM017 detailed within **Table 9-23, Chapter 9: Biodiversity Part A** of the ES [**APP-048**], and complimentary measures detailed within measures S-W12, S-B14, A-B29 and A-B33 of the **Outline CEMP** [**REP3-013 and REP3-014**], would also be applied to the installation of the temporary river training measures and piling activities associated with the bank stabilisation. This includes the timing of these works outside the 'in river works' period, restriction of works to daylight hours and implementation of a fish rescue plan during dewatering activities to create a dry area behind the river training measures. Night works may be required in relation to the formation of an access off the A1 carriageway into the works area. However, these works would be away from the river at the top of the northern bank. As such, there are no anticipated disturbance impacts predicted as a result of these night works. Supervision would also be provided by an Ecological Clerk of Works or fish biologist with sufficient experience of fish rescue plans, who would temporarily suspend works should evidence be obtained to suggests the works are having a negative impact on fish migration/spawning. Fish rescue would also include a search for lamprey ammocoetes (larvae) that may be present. The river training measures may be in situ for approximately 16 months, although once installed would not incur a barrier to fish migration as the training measures are located close to the northern riverbank.

8.9.6. Following the removal of the temporary river training measures, the riverbed would be restored to a pre-works comparable condition, as outlined in **Appendix E: Register of Environmental Actions and Commitments** of this ES Addendum.

8.9.7. The permanent scour protection would be designed to be in keeping with existing natural rocky areas of the River Coquet (see Image 1 below as an example). Whilst the scour protection would result in the permanent loss of natural riverbank habitat, the design of the scour protection would provide suitable sheltering habitat for aquatic invertebrates and juvenile fish and would naturally become vegetated over time. The design and form of the permanent scour protection is detailed **within Appendix E: Register of Environmental Actions and Commitments** of this ES Addendum.

Image 1. Existing rocky banks of the River Coquet. Image of the southern bank of the river, to the immediate east of the existing A1 bridge. Photo taken 22 August 2018

8.9.8. To address the loss of woodland within the Coquet River Felton Park LWS, adopted as ancient woodland for the purposes of mitigation, the areas of additional permanent land take to facilitate the compensatory habitat have been incorporated into the revised **Ancient Woodland Strategy Part A for Change Request** (submitted at Deadline 4 of the Examination). In addition to the measures detailed within the former **Ancient Woodland Strategy Part A** [**APP-247**], the following measures have been included in the revised **Ancient Woodland Strategy Part A for Change Request** (submitted at Deadline 4) (which are also outlined **in Appendix E: Register of Environmental Actions and Commitments** of this ES Addendum):

a. There would be site-specific sampling for the additional land to determine soil pH and nutrient status, which would be used to inform soil preparation post-construction prior to planting (see item b below);

b. The additional land take (0.28 ha) would be replanted as broadleaved, semi-natural woodland, using native species of local provenance, in keeping with the retained surrounding woodland (referred to as the "Replanted Area" within the revised **Ancient Woodland Strategy Part A for Change Request** submitted at Deadline 4);

c. An additional area of approximately 3.1 ha of compensatory woodland habitat would be created, an expansion to the Woodland Creation Area located to the south-west of the existing River Coquet Bridge (as detailed in revised **Ancient Woodland Strategy Part A for Change Request** (submitted at Deadline 4)). In combination with the replanting of the

0.28 ha of land to the north of the River Coquet, the proposed woodland creation equates to a ratio of approximately 1:12 (loss:creation); and

d. Monitoring and maintenance of the associated replanted and created woodland as part of the revised **Ancient Woodland Strategy Part A for Change Request** (submitted at Deadline 4).

8.9.9. The replanted and created woodland discussed in **paragraph 8.9.8** above would provide opportunities for nesting birds to compensate for the loss of woodland.

8.9.10. The temporary loss of woodland to the west of the carriageway would be incorporated into the future great crested newt European Protected Species (EPS) licence application. The future licence application would be issued to Natural England prior to construction. The additional area to the west of the carriageway would be included within the area enclosed by amphibian exclusion fencing. This would be followed by a capture and translocation period, to move newts out of the works area prior to site clearance and construction. Following construction, the woodland would be reinstated (temporary loss of habitat). As detailed in **Table 1-1**, consultation with Natural England confirmed that it is not necessary to update the existing draft great crested newt licence (**Appendix 9.24: Great Crested Newt Method Statement River Coquet Part A** of the ES [**APP-250**]) in response to the proposed changes to the Scheme. Natural England confirmed an updated LONI would be provided to confirm that, as the competent licensing authority, Natural England sees no impediment to issuing a licence in the future based on information assessed to date (inclusive of the Scheme and the proposed changes to the Scheme). All engagement with Natural England shall also be captured within the Statement of Common Ground.

OPERATION

8.9.11. A management and monitoring strategy for the proposed scour protection of the northern riverbank would be developed at detailed design in consultation with Natural England and the Environment Agency. The requirement for the strategy is captured within **Appendix E: Register of Environmental Actions and Commitments** of this ES Addendum. The strategy would include, but not limited to, inspections of the scour protection at an appropriate frequency throughout its lifespan to monitor the structural condition and conduct repairs/replacement where necessary. Any repair or replacement works would be subject to the same construction mitigation detailed within **Section 9.9, Chapter 9: Biodiversity Part A** of the ES [**APP-048**], relevant measures within the **Outline CEMP** [**REP3-013** and **REP3-014**] and **paragraphs 8.9.2 to 8.9.7** of this ES Addendum.

8.9.12. An assessment of the biological water quality and water chemistry would be undertaken post-construction to monitor water conditions within the River Coquet. The results of the monitoring would be compared against baseline data collected prior to and during construction. If required, remedial actions would be implemented following consultation and agreement with Natural England and the Environment Agency. The requirement for this post-construction monitoring is captured within **Appendix E: Register of Environmental Actions and Commitments** of this ES Addendum.

8.10 ASSESSMENT OF LIKELY SIGNIFICANT EFFECTS

8.10.1. An assessment of likely significant effects is presented below for those ecological receptors that may be impacted by the Stabilisation Works. The significance of effects for all other

ecological receptors, detailed within **Section 9.10, Chapter 9: Biodiversity Part A** of the ES [**APP-048**], remains unchanged and valid.

CONSTRUCTION

Statutory Sites, Non-Statutory Sites and Ancient Woodland

8.10.2. The Stabilisation Works would result in the permanent loss of natural habitat along the northern bank of the River Coquet (part of the River Coquet and Coquet Valley Woodlands SSSI) as a result of the construction of the permanent scour protection.

8.10.3. The design of the scour protection has been considered to reduce the level of impact to the SSSI. As detailed in **paragraph 8.9.7** above, the design of the scour protection would provide suitable sheltering habitat for aquatic invertebrates and fish (qualifying features of the SSSI) and shall naturally become vegetated over time. In addition, as detailed in **paragraph 8.9.2**, the scour protection would be designed to avoid permanent impacts to the watercourse (SSSI) as a result of changes in water chemistry.

8.10.4. Mitigation detailed within **Chapter 9: Biodiversity Part A** of the ES [**APP-048**] would reduce the effects of habitat damage/degradation, including adherence to Pollution Prevention Guidance (PPG) (see EM045 of **Table 9-23, Chapter 9: Biodiversity Part A** of the ES [**APP-048**]), which has been secured in measure A-B38 of the **Outline CEMP** [**REP3-013** and **REP3-014**]. Measure A-W15 of the **Outline CEMP** [**REP3-013** and **REP3-014**] includes the use of sediment barriers between earth works, the construction zone and the watercourse to prevent sediment from washing into the river. Silt management would be implemented not only adjacent to the watercourse, but also up the valley sides to minimise fine sediment input to the watercourse. In addition, the **Outline CEMP** [**REP3-013** and **REP3-014**] includes adherence to the control of water pollution from construction sites guidance produced by the Construction Industry Research and Information Association (CIRIA) (C532), as well as other good practice guidance (see S-W8 of the **Outline CEMP** [**REP3-013** and **REP3-014**]).

8.10.5. Further, mitigation is proposed to control sources of disturbance (noise, light and vibration) detailed within **Section 9.9, Chapter 9: Biodiversity Part A** of the ES [**APP-048**]; measures S-G5, S-B14 and S-B16 of the **Outline CEMP** [**REP3-013** and **REP3-014**].

8.10.6. The loss of riverbank habitat represents an adverse impact to an ecological receptor of National importance. As such, in strict accordance with the DMRB, the loss of riverbank habitat as a result of the Stabilisation Works might be considered to result in a Very Large adverse effect to the SSSI. However, the extent of impact to riverbank habitat as a result of the land stabilisation north of the River Coquet represents approximately 0.19% of the total bank length of the SSSI unit (Unit 5) within which the Stabilisation Works are located and is unlikely to affect the integrity of the SSSI or its ecological function. This takes into account a total of 62 m of rock armour and 24 m of green-grey bank protection. Therefore, the significance of effect is downgraded. The loss of riverbank habitat of the SSSI as a result of the Stabilisation Works would result in a direct, permanent Moderate Adverse effect. This does not exceed the Very Large adverse effect to the SSSI as a result of the loss of ancient woodland habitat within the SSSI, as detailed in **paragraph 9.10.2**, **Chapter 9: Biodiversity Part A** of the ES [**APP-048**].

8.10.7. The Stabilisation Works would result in the loss of 0.28 ha of broadleaved woodland within the Coquet River Felton Park LWS, adopted as ancient woodland for the purposes of

mitigation and compensation. This is in addition to the 0.41 ha of LWS woodland lost and assessed within **Chapter 9: Biodiversity Part A** of the ES [**APP-048**]. However, following the implementation of the revised **Ancient Woodland Strategy Part A for Change Request** (submitted at Deadline 4) and additional measures detailed above (see **paragraph 8.9.8** of this ES addendum), it is considered that the significance of effect to the LWS due to the loss of habitat remains the same, Moderate Adverse, as detailed in **paragraph 9.10.3, Chapter 9: Biodiversity Part A** of the ES [**APP-048**].

Great Crested Newts

8.10.8. The Stabilisation Works would result in additional loss of great crested newt terrestrial habitat, although considered temporary as proposals are to reinstate the woodland habitat post-construction. Following the implementation of an EPS licence, the Stabilisation Works would result in a Neutral (not significant) effect to great crested newts during construction. As such, there is no change to the significance of effect reported in **Chapter 9: Biodiversity Part A** of the ES [**APP-048**].

Breeding Birds

8.10.9. The Stabilisation Works would result in loss of habitat that may support nesting birds, although considered temporary as proposals are to reinstate the woodland habitat post-construction. Proposed habitat reinstatement and woodland creation in relation to the Stabilisation Works would provide nesting opportunities for birds.

8.10.10. Mitigation detailed within **Chapter 9: Biodiversity Part A** of the ES [**APP-048**] includes the timing of vegetation and site clearance (see EM001 of **Table 9-23, Chapter 9: Biodiversity Part A** of the ES [**APP-048**]), which has been secured via measure S-B9 of the **Outline CEMP** [**REP3-013** and **REP3-014**].

8.10.11. Following the successful implementation of mitigation, the Stabilisation Works would not alter the assessment of significant effects detailed within **Chapter 9: Biodiversity Part A** of the ES [**APP-048**]. As such, it is considered Part A would result in a Neutral (not significant) effect to breeding birds during construction.

Otter

8.10.12. Following the successful implementation of mitigation to reduce disturbance impacts detailed within **Section 9.9, Chapter 9: Biodiversity Part A** of the ES [**APP-048**] and measure A-B2 of the **Outline CEMP** [**REP3-013** and **REP3-014**]. , the Stabilisation Works would not alter the assessment of significant effects detailed within **Chapter 9: Biodiversity Part A** of the ES [**APP-048**]. As such, it is considered Part A would result in a Neutral (not significant) effect to otter during construction.

Fish

8.10.13. The Stabilisation Works would incur temporary disturbance to fish during the installation of river training measures, which would include the creation of a dry works area, and subsequent construction of the permanent scour protection works. Temporary disturbance may also occur during the installation of erosion protection measures on the northern bank, particularly as a result of piling activities. Mitigation measures are proposed to reduce the effects of disturbance (seasonal and daily timing of works, supervision from an ECoW, control of light, noise and vibration) and to rescue fish during the works. In addition,

sediment barriers would be used between earth works, the construction zone and the watercourse to prevent sediment from washing into the river.

8.10.14. Whilst the river training measures are in place, the works would incur a temporary obstruction to an area of river that may be used by fish. However, works would not result in an obstruction to migration as river training measures would be located close to the northern riverbank. The Stabilisation Works would incur the permanent loss of a small stretch of the northern riverbank as a result of the permanent scour protection. However, as detailed in **paragraph 8.9.7** above, the design of the scour protection would allow for natural vegetation colonisation and development overtime. As such, in the long-term, opportunities for sheltering juvenile fish would be created.

8.10.15. Following successful implementation of mitigation, the Stabilisation Works would result in a temporary Slight Adverse effect to fish (not significant) during construction. As such, there is no change to the significance of effect reported in **Chapter 9: Biodiversity Part A** of the ES [**APP-048**].

Aquatic Invertebrates

8.10.16. The Stabilisation Works would result in the temporary loss of aquatic habitat during construction of the scour protection and creation of a dry area, although this would be reinstated post-construction. The construction of the permanent scour protection would result in the permanent loss of a small stretch of the northern riverbank. Nevertheless, the design of the scour protection shall provide suitable sheltering habitat for aquatic invertebrates and shall naturally become vegetated over time.

8.10.17. Mitigation detailed within **Chapter 9: Biodiversity Part A** of the ES [**APP-048**] would reduce the effects of habitat damage/degradation, including adherence to Pollution Prevention Guidance (PPG) (see EM045 of **Table 9-23, Chapter 9: Biodiversity Part A** of the ES [**APP-048**]), which has been secured via measure A-B38 of the **Outline CEMP** [**REP3-013** and **REP3-014**]. Measure A-W15 of the **Outline CEMP** [**REP3-013** and **REP3-014**] includes the use of sediment barriers between earth works, the construction zone and the watercourse to prevent sediment from washing into the river. In addition, the **Outline CEMP** [**REP3-013** and **REP3-014**] includes adherence to the control of water pollution from construction sites guidance produced by the Construction Industry Research and Information Association (CIRIA) (C532), as well as other good practice guidance (see S-W8 of the **Outline CEMP** [**REP3-013** and **REP3-014**]).

8.10.18. Following the successful implementation of mitigation, the Stabilisation Works would not alter the assessment of significant effects detailed within **Chapter 9: Biodiversity Part A** of the ES [**APP-048**]. As such, it is considered Part A would result in a Slight temporary, adverse effect to aquatic invertebrates (not significant) during construction.

OPERATION

8.10.19. Following the implementation of the proposed management and monitoring strategy for the permanent scour protection, effects to both the River Coquet watercourse (HPI), River Coquet and Coquet Valley Woodlands SSSI, otter, fish and aquatic invertebrates as a result of materials entering the watercourse are predicted to be Neutral (not significant).

8.10.20. Regarding impacts to biodiversity due to permanent changes in morphology, the operational geomorphology assessment presented within **Chapter 9: Road Drainage and Water Environment** (summarised in **Table 9-8**) of this ES Addendum concludes that whilst there

may be local effects on the dynamics of water flow, water velocity, sediment regime and natural fluvial processes as a result of the proposed scour protection, impacts are predicted to be minor adverse or negligible. It is therefore concluded that the impacts to biodiversity would also be comparable (minor adverse or negligible) in relation to geomorphology. The permanent changes in morphology would result in Slight Adverse (not significant) effects to biodiversity (namely River Coquet watercourse (HPI), River Coquet and Coquet Valley Woodlands SSSI, fish and aquatic invertebrates).

8.10.21. As such, whilst the significance of effects has increased from that reported in **Section 9.10, Chapter 9: Biodiversity Part A** of the ES [**APP-048**], the effects remain not significant.

8.11 MONITORING

8.11.1. Monitoring would be undertaken as part of the maintenance and monitoring strategy for the permanent scour protection. The details of the proposed monitoring would be determined at detailed design in consultation with Natural England and the Environment Agency.

8.11.2. All other monitoring requirements for Biodiversity have not changed due to the Stabilisation Works and the text within **Section 9.11, Chapter 9: Biodiversity Part A** of the ES [**APP-048**] remains valid.

8.12 UPDATED DMRB GUIDANCE

8.12.1. Since the assessments in the ES were completed, the DMRB methodology was superseded and replaced with updated guidance as detailed in **Section 9.4, Chapter 9: Biodiversity Part A** of the ES [**APP-048**]. As detailed in **paragraph 9.4.31** of **Chapter 9: Biodiversity Part A** of the ES [**APP-048**], with the exception of the updated guidance relating to air quality (LA 105 Air Quality), the other updated DMRB guidance documents relevant to the Biodiversity assessment are less prescriptive in their requirements regarding methodologies and approach to mitigation when compared to the former guidance. The updated DMRB guidance primarily references best practice, Chartered Institute of Ecology and Environmental Management (CIEEM) guidelines and standing advice, which were used to inform the assessment presented within this ES Addendum. As detailed in **paragraph 4.1.2** of this ES Addendum, an assessment in relation to operational air quality has been scoped out. As such, the conclusions of the assessment in this ES Addendum in relation to potential impacts and their likely significance would remain unchanged with the application of the updated guidance.

9 ROAD DRAINAGE AND THE WATER ENVIRONMENT

9.1 INTRODUCTION

9.1.1. **Chapter 10: Road Drainage and the Water Environment Part A** of the ES [**APP-050**] considers the likely significant effects of Part A on Road Drainage and the Water Environment.

9.1.2. This section of the ES Addendum considers only the likely significant effects of the Stabilisation Works on Road Drainage and the Water Environment.

9.2 COMPETENT EXPERT EVIDENCE

9.2.1. As detailed in **Table 9-1**, the professionals contributing to the production of this assessment have sufficient expertise to ensure the completeness and quality of this assessment. The table sets out the details of expertise where this is different to those presented in the ES.

Table 9-1 – Road Drainage and the Water Environment Professional Competence

Name	Role	Qualifications and Professional Membership	Experience
Alexander Bellis	Author (Geomorphology)	BA (Hons) Geography MSc Applied Geomorphology Fellow of Geological Society of London Member of the British Society for Geomorphology	Eight years of experience in consultancy as a geomorphologist including contributions to EIA assessment for: - A9 Glen Garry to Dalraddy (Central Section) Dualling - Hawick Flood Protection scheme - A82 (Tarbet to Inverarnan) Improvements
Ian Coleman	Author (Groundwater)	PhD Hydrogeology, Newcastle University MSc Groundwater Engineering, Newcastle University BSc (Hons) Geology and Geography, University of Bedfordshire Fellow of the Geological Society	19 years' experience providing consultancy support to infrastructure, industrial, public sector and private clients in groundwater, contaminated land and environmental assessment. 8 years Environmental Impact Assessment (EIA) experience, recent project experience includes work on EIA for large road and other infrastructure

Name	Role	Qualifications and Professional Membership	Experience
			developments in England, Scotland and Wales.
Andrew Picken	Author (Water Quality)	BSc (Hons) Physics MSc Applied Meteorology Member of the Chartered Institute of Water and Environmental Management (MCIWEM) Chartered Water and Environmental Manager (C.WEM)	11 years' experience in environmental consultancy providing water related support to infrastructure, public sector, and private clients in water quality, flood risk, and environmental assessment. Nine years' water environment impact assessment, recent project experience includes: - A9 Pass of Birman to Tay Crossing - Confidential Water Pipeline Upgrade
Ian Griffin	Reviewer	BSc (Hons) Botany PhD Environmental Science Member of the Chartered Institute of Water and Environmental Management (MCIWEM) Chartered Water and Environmental Manager (C.WEM) Chartered Environmentalist (CEnv)	19 years' academic, conservation and consultancy experience in river process, geomorphology, hydrology and environmental engineering. Recent relevant project experience includes: - Technical Lead, A9 Pass of Birman to Tay Crossing - Technical Lead, A9/A96 Inches to Smithton - Project Principal, Manchester North West Quadrant

9.3 LEGISLATIVE AND POLICY FRAMEWORK

9.3.1. The legislative and policy framework for Road Drainage and the Water Environment has not changed since the publication of the ES. Therefore, the text within **Section 10.3, Chapter 10: Road Drainage and the Water Environment Part A** of the ES [**APP-050**] remains valid.

9.4 ASSESSMENT METHODOLOGY

9.4.1. In order to ensure a comparable assessment with the ES, the assessment methodology followed for Road Drainage and the Water Environment within **Section 10.4, Chapter 10: Road Drainage and the Water Environment Part A** of the ES [**APP-050**] remains unchanged and valid, other than the limited, specific changes relating to the geomorphological assessment as described below.

GEOMORPHOLOGICAL ASSESSMENT

9.4.2. The geomorphological assessment for this ES Addendum comprises a desk study drawing upon baseline data collected and documented in **Appendix 10.7: Geomorphology Assessment – River Coquet Parameter 10 Part A** of the ES [**APP-260**], and site visits carried out on 26 January and 26 February 2021. During the site visit, channel forms, features, processes and flow types were mapped and a geolocated photographic record captured. In addition, the presence and extent of existing modifications were mapped, which included the existing A1 bridge pier, river training works, drainage outfall and estimated extent of construction works area from the existing bridge. In addition, the weir approximately 700 m downstream of the A1 bridge was surveyed and the estimated upstream backwater effect mapped.

9.4.3. The geomorphological assessment also draws upon the results from hydraulic calculations of water level, velocity, stream power and shear stress to assess potential changes in sediment transport, erosion and deposition. The methodologies of these calculations are the same as those documented in **Appendix 10.7: Geomorphology Assessment – River Coquet Parameter 10 Part A** of the ES [**APP-260**]

9.4.4. The previous assessment in **Table 5-2** of **Appendix 10.7: Geomorphology Assessment – River Coquet Parameter 10 Part A** of the ES [**APP-260**] provides criteria for estimating the magnitude of impact on the River Coquet. This table has been adapted (**Table 9-2**) to make it specific for the purposes of assessing the geomorphological impacts for the Stabilisation Works within this ES Addendum.

Table 9-2 - Criteria for Estimating the Magnitude of Impact on the River Coquet

Magnitude	Description
Major Adverse	Sediment regime: Major change to the natural equilibrium through modification, significantly changing the natural function of the watercourse (sediment source, sink or transfer zone). This may arise from a major increase in amount of fine sediment and turbidity and/or transport of large (boulder) particle sizes. Channel morphology: Major impacts on channel morphology through the removal of a wide range of morphological features. Significant alteration to the natural channel cross-section and bank profiles. A significant increase in stream power may result. Which may pose erosion risk problems. Natural fluvial processes: Major interruption to fluvial processes such as channel planform evolution or erosion and deposition.
Moderate Adverse	Sediment regime: Moderate change to the natural equilibrium through modification, partially changing the natural function of the

Magnitude	Description
	watercourse (sediment source, sink or transfer zone). This may arise from a moderate increase in amount of fine sediment and turbidity and/or transport of large substrate sizes (large cobbles and small boulders). Channel morphology: Moderate impact on channel morphology through the removal of a range of morphological features. Any works that may alter out-of-bank flows and cause scour. Natural fluvial processes: Moderate interruption to fluvial processes such as channel planform evolution or erosion.
Minor Adverse	Sediment regime: Minor change to the natural equilibrium through modification, locally changing the natural function of the watercourse (sediment source, sink or transfer zone). This may arise from a slight increase in amount of fine sediment and turbidity and/or transport of small cobbles. Channel morphology: Limited impact on channel morphology, through removal of some morphological features. Natural fluvial processes: Slight change in fluvial processes operating in the river; any change is likely to be localised.
Negligible	Sediment regime: Negligible change to the natural equilibrium. Negligible amount of sediment released into the watercourse, with no noticeable change to the turbidity or bed substrate. Channel morphology: No significant impact on channel morphology in the local vicinity of proposed new River Coquet bridge. Natural fluvial processes: No change in fluvial processes operating in the river; any change is likely to be highly localised.

9.4.5. In addition, to account for the potential impacts arising from the Stabilisation Works, the magnitude of impact assessed takes into account the duration of the impact, and reversibility of the impact.

9.5 ASSESSMENT ASSUMPTIONS AND LIMITATIONS

9.5.1. The assessment assumptions and limitations stated within **Section 10.5, Chapter 10: Road Drainage and the Water Environment Part A** of the ES [**APP-050**] remains unchanged and valid for the purposes of this assessment.

9.5.2. The hydraulic analysis undertaken to support the assessment set out in this ES Addendum is limited to a single cross section of the channel and utilises one-dimensional hydraulic calculation methods to estimate water level, velocity, stream power and shear stress.

9.5.3. The method allows an approximation of the magnitude of impact of the proposed works. However, the spatial extent (upstream and downstream) of such change cannot be evaluated at this time. Further detailed hydraulic modelling is anticipated within the Examination to allow verification of these results and provide further detail on the spatial extents and changes in flow and sediment behaviour in the vicinity of the works.

9.6 STUDY AREA

9.6.1. The Study Area for the Road Drainage and the Water Environment assessment has not changed for the Stabilisation Works. The additional land required for the Stabilisation Works is located within the defined Study Areas for the discipline topics which extend several hundred metres upstream and downstream of Part A. Therefore, the text within **Section 10.6, Chapter 10: Road Drainage and the Water Environment Part A** of the ES [**APP-050**] and **Appendix 10.7: Geomorphology Assessment – River Coquet Parameter 10 Part A** of the ES [**APP-260**] remains unchanged and valid.

9.7 BASELINE CONDITIONS

9.7.1. The baseline for the Road Drainage and the Water Environment assessment has not changed for the Stabilisation Works except for the points detailed below.

9.7.2. Review of the Environment Agency's Catchment Data Explorer2 indicates an overall quality of the River Coquet (Coquet from Forest Burn to Tidal Limit) of 'Moderate' with the ecological quality assessed as 'Good' and the chemical quality assessed as 'Fail', due to a fail for priority substances. The hydromorphological status remains unchanged as 'Supports Good'.

9.7.3. The River Coquet is designated as part of the River Coquet and Coquet Valley Woodlands SSSI. The SSSI is designated for aquatic flora and fauna, the habitats for which have the potential to be affected by geomorphological change. In accordance with **Appendix 10.7: Geomorphological Assessment – River Coquet Parameter 10 Part A** of the ES [**APP-260**] an importance of 'High' has been given to the River Coquet when assessing the geomorphological importance of the river.

9.7.4. The site visits carried out on the 26 January and 26 February 2021 showed that the north bank within the reach of the proposed works exhibited evidence of previous modification. This included modification associated with the construction of the existing crossing, including means for access, and a highway related drainage outfall with associated rock armour protection. The south bank also exhibits modification with encroachment into the channel from river training works associated with the existing southern bridge pier (a total length of 35 m, including the pier and the river training works upstream and downstream of the pier). Approximately 640 m downstream of the proposed works, a river wide weir impounds the river creating a backwater effect which extend approximately 300-350 m upstream (to within 300-350 m of the proposed works).

9.7.5. Further monitoring of groundwater in five ground investigation boreholes on the north side of the River Coquet has been undertaken between January and March 2020 (BH1904, BH1906, BH1910, BH1911 and BH1914)3. Of these, only two are monitoring groundwater in the superficial deposits (BH1906 and BH1914) and these have recorded maximum

[2] Environment Agency (2020), Catchment Data Explorer [Available online] https://environment.data.gov.uk/catchment-planning/ [Accessed December 2020]

[3] Jacobs (2020), A1 Morpeth to Ellingham Dualling – River Coquet Combined Preliminary Sources Study And Ground Investigation Report. HE551459-JAC-HGT-M2F_S03_NS39363-RP-GI-0001, Rev. P02.

groundwater levels between around 0.6 m and 4 m below ground level. This is consistent with conditions reported in **Chapter 11: Geology and Soils Part A** of the ES [**APP-052**]. For the purposes of the assessment set out in this ES Addendum, the functional groundwater surface has been assumed to be shallow, at around 1 m below ground level, on the north side of the River Coquet.

9.7.6. The remainder of the text within **Section 10.7, Chapter 10: Road Drainage and the Water Environment Part A** of the ES [**APP-050**] and **Appendix 10.7: Geomorphology Assessment – River Coquet Parameter 10 Part A** of the ES [**APP-260**] remains unchanged and valid.

9.8 POTENTIAL IMPACTS

CONSTRUCTION

9.8.1. The potential impacts during the construction phase of the Stabilisation Works would be short-term, limited to the duration of the works, which is anticipated to be around 16 months for near and in-channel works.

9.8.2. During construction, the anticipated impacts of the Stabilisation Works are:

a. Potential for increased fine sediment delivery to the watercourse.
b. Reduced groundwater baseflow to the River Coquet due to groundwater drawdown.
c. Ground disturbance and compaction associated with construction.
d. Potential for subsidence impact to the existing A1 and road bridge.
e. Potential geomorphological (hydromorphological) impacts including:
f. Potential for alteration of the sediment regime.
g. Potential for an increase in fluvial activity, such as erosion of mobile bed material and the banks within the area of the proposed works as well as downstream.
h. Potential for loss or adverse impact to bed and bank morphological features.

9.8.3. These impacts are discussed in more detail in **paragraphs 9.8.4** to **paragraphs 9.8.10** below, with further information on geomorphological impacts included in **Table 9-3**.

Sedimentation

9.8.4. There is the potential for temporary increases in sedimentation within the River Coquet caused by surface water runoff containing elevated levels of suspended particles, which may result from activities associated with the installation of the piling platform and associated river training works required for the Stabilisation Works. It is anticipated that the works would require the formation of a series of haul roads and platforms to be constructed to allow for access to the working area. This would involve cuts into the existing slope which would result in exposed areas susceptible to surface water erosion. To reach a suitable working elevation for the platforms, fill material would be placed on the ground surface. Plant machinery tracking may also lead to increased sediment generated due to the localised disturbance caused by repeated movements of heavy vehicles.

9.8.5. In-channel works would be required for the placement of the temporary river training structures and construction of the lower piling platform. These works could mobilise sediments from the removal of bank-side vegetation which may lead to an increase in suspended sediment and turbidity within the river.

Pollution Risk

9.8.6. Due to the close proximity of works in relation to the River Coquet, there is increased risk of pollution from the spillage or leak of fuels or other harmful substances from plant machinery. Earthworks required for the haul roads and working areas may expose unidentified contaminants which may be a risk to water quality.

Construction Activities within Watercourses

9.8.7. There is the potential for impacts to the hydromorphological, chemical and ecological quality associated with the Stabilisation Works within, or in close proximity to the River Coquet, from the installation of the piling platform and associated river training works. Further details on the potential impacts to geomorphological process are detailed below.

Groundwater Resources

9.8.8. There is the potential for a localised reduction in baseflow to the River Coquet due to groundwater drawdown associated with excavation of access, piling and crane working platforms. Furthermore, baseflows could be impacted from ground disturbance and compaction associated with construction of piling and crane working platforms.

9.8.9. There is also the potential for subsidence impact to the existing A1 and road bridge due to groundwater drawdown associated with excavation of access, piling and crane working platforms.

Geomorphology

9.8.10. Potential impacts on geomorphology during construction are summarised in **Table 9-3**

Table 9-3 – Potential Impacts on Fluvial Geomorphology during Construction

Source of impact	Potential impact to	Description
Lower north bank piling platform and associated works, including temporary retaining wall/river training works.	Sediment regime	Construction of the piling platform and temporary retaining wall/river training works could lead to a short-term increase in the volume of fine sediment directly entering the channel and cause siltation of the channel substrate. Any out-of-bank flows reaching the construction areas may entrain material from exposed stockpiles, surfaces and excavations which may be transported to the watercourse. This sediment may be carried a considerable distance downstream, with the potential for detrimental impacts on important aquatic habitats. The restriction of flow and reduced channel width due to the river training walls may, for the duration of the works, alter the sediment transport competence of the river locally, potentially resulting in increased sediment transport competence adjacent to the river training works. Upstream of the works, the channel constriction may result in the potential for reduced sediment transport during times of high flows. The prevailing sediment transport regime is characterised by efficient transport of coarse sediment through the reach with relatively little deposition driven by the confined nature of the gorge and bedrock channel. The potential for significant deposition upstream is therefore low. There may be a very limited and localised impact on coarse sediment supply at times of high flow due to the works footprint extending over any potential bank and bed sediment sources, thus reducing sediment supply to the channel from the left bank. The channel constriction may however increase the risk of erosion to the right bank with the potential to increase sediment supply from this bank.
	Channel morphology	Changes in sediment transport capacity may locally change the distribution of erosional and depositional features. In addition, bank and bed features, including riparian vegetation, would be lost within the footprint of the works. There may also be a requirement to 'key in' the temporary river training works to the bed, which may include removal of some bed material (including bedrock) to create a level surface on which to construct the retaining wall.
	Natural fluvial processes	The encroachment of the works into the channel would alter the channel dynamics under both low and high flow conditions. This could result in increased coarse sediment deposition upstream, bed scour and lateral erosion parallel with the works and downstream eddying (beyond the channel constriction). These changes may locally change fluvial process and the distribution of erosional and depositional features. At low to normal flows, very localised changes in velocities may be anticipated adjacent to the river training walls, causing very localised changes in sand and fine sediment deposition here. Away from the river training walls, there is unlikely to be any impact on velocities, sediment transport, erosion or deposition.

9.8.11. All other impacts during construction, detailed within **Section 10.8, Chapter 10: Road Drainage and the Water Environment Part A** of the ES [**APP-050**], remain unchanged and valid.

OPERATION

9.8.12. During operation of the Scheme, the anticipated impacts of the Stabilisation Works are:

a. Reduced groundwater baseflow to the River Coquet due to installation of piles for ground stabilisation.

b. Increased potential for groundwater flooding on the upgradient side of piles installed for ground stabilisation and bridge foundations.

c. Increased modification to the watercourse due to the permanent stabilisation works and associated erosion and scour protection measures.

d. Potential for the permanent alteration of the sediment regime, channel morphology and natural fluvial processes due to the introduction of erosion protection.

9.8.13. These impacts are discussed in more detail in **paragraphs 9.8.14** to **paragraphs 9.4.18** below, with further information on geomorphological impacts included in **Table 9-4**.

9.8.14. The total extent of rock armour required for the north bank would be a maximum of approximately 62 m. The extent of natural bank that this would impact is approximately 51 m because rock armour would be constructed over 11 m of bank that was disturbed and reinstated during the construction of the pier for the existing River Coquet Bridge.

9.8.15. A further 24 m of bank that would be disturbed during construction would be reinstated to existing profiles, as much as reasonably practicable, following completion of the temporary works using green or green-grey erosion control methods set out in HR Wallingford (2017)[4] and planted to allow recovery of the riparian vegetation structure.

Sedimentation

9.8.16. Surfaces exposed during construction of the Stabilisation Works would remain to be temporarily prone to surface water runoff during reinstatement and the establishment of erosion controls. This could lead to increased inputs of suspended solids and turbidity which could temporarily deteriorate water quality until establishment is achieved.

Groundwater Resources

9.8.17. There is the potential for reduced groundwater baseflow to the River Coquet due to the permanent pile installation for ground stabilisation. There is increased potential for groundwater flooding on the upgradient side of the permanent pile installations required for the ground stabilisations.

[4] HR Wallingford (2017) Green approaches in river engineering, Supporting implementation of green infrastructure.

Geomorphology

9.8.18. During operation, the anticipated impacts of the Stabilisation Works are shown in **Table 9-4.**

Table 9-4 – Potential Impacts on Fluvial Geomorphology during Operation

Source of impact	Potential impact to	Description
North bank stabilisation including erosion protection.	Sediment regime	The protection of 62 m of bank may lead to a very localised reduction in availability of erodible material and reduced sediment supply from the protected banks. Further protection of a 24 m of bank, which was disturbed during the construction works may lead to a very localised reduction in the availability of erodible bank material and very localised reduction in sediment supply from the grey-green protected banks. Increased run-off may occur locally due to immature vegetation in the reinstated construction zone, outwith the extent of the permanent erosion protection.
	Channel morphology	The works are anticipated to reinstate the existing bank profile, to minimise change to the channel geometry. However, some bank and near-bank bed morphological features would be permanently lost within the footprint of these works.
	Natural fluvial processes	The change in materials from which the bank is composed would, by necessity of design, reduce the channel's ability to adjust within the extent of the works, thus protecting the asset. The north bank stabilisation erosion protection may lead to a very localised alterations in channel cross sectional area, and bank roughness which could potentially cause very localised changes to stream power, channel velocity, water level and erosion and deposition during high flows. For example, a reduced bank roughness of the proposed revetment, compared to the current tree lined bank could increase erosion immediately downstream of the revetment. In addition, any exposed hard revetment edges may also drive localised erosion if adjacent to the natural bank. At low to normal flows, very localised changes in velocities may be anticipated adjacent to the scour protection, causing very localised changes in sand and fine sediment deposition here. Away from the channel

Source of impact	Potential impact to	Description
		margins there is unlikely to be any impact on velocities, sediment transport, erosion or deposition.

9.8.19. All other impacts during operation of Part A, detailed within **Section 10.8, Chapter 10: Road Drainage and the Water Environment Part A** of the ES [**APP-050**], remain unchanged and valid.

9.9 DESIGN, MITIGATION AND ENHANCEMENT MEASURES

9.9.1. In addition to the measures detailed within **Section 10.9, Chapter 10: Road Drainage and the Water Environment Part A** of the ES [**APP-050**], the following mitigation measures would be implemented.

9.9.2. Prescribed mitigation measures to address any potential impacts arising from the Stabilisation Works as detailed in **Table 9-5** and **Table 9-6** and included within **Appendix E: Register of Environmental Actions and Commitments** of this ES Addendum.

CONSTRUCTION

9.9.3. The duration of the construction impacts is anticipated to be around 16 months for near-channel and in-channel works. Following this period, bank and bed features which would not be replaced by permanent infrastructure (see **Operation Section** below), would be reinstated as close as possible to their original form.

9.9.4. A summary of the mitigation measures to reduce the impact of the construction activities are provided in **Table 9-5** and outlined in **Appendix E: Register of Environmental Actions and Commitments** of this ES Addendum.

Table 9-5 – Mitigation Measures for Construction

Source of impact	Mitigation Measure	Type of mitigation
General construction activities associated with proposed design.	Previous assessment has listed mitigation for reducing and preventing fine sediment delivery to the channel. These proposed measures are relevant to this ES Addendum. Furthermore, sediment barriers (i.e. silt fences) would be installed at regular intervals following slope contours. The silt fences would be placed at regular intervals between the slope crest and foot to reduce the silt accumulation burden placed on silt fence. Silt fences and/or other edge protection measures would be installed along the River Coquet bank to reduce the risk of increased sedimentation entering the channel during construction. A site-specific drainage management plan would be created to attenuate, treat and discharge site runoff. Due consideration of the drainage requirements would be given to collect, attenuate, treat and discharge any groundwater seepage that may occur due to cuts into the slope. Suitable surface material should be used on haul roads to reduce structural damage from vehicular movements and exposure of bare ground which would be susceptible to surface water runoff. Deploy in-channel silt barriers (i.e. silt curtains or similar) as far as reasonably practical or a similar form of barrier if silt water runoff is discharging into the River Coquet to control the downstream dispersion of suspended solids. Install a suitable geomembrane between the river training works and piling platform to minimise the release of construction aggregate associated with the piling platform. During periods of heavy rain, adopt regular visual inspections of the watercourse to identify discharges of silt laden runoff and take immediate action if required.	Reduction and prevention
Lower north bank piling platform and associated works, including temporary retaining wall/river training works.	Near and in-channel works to be anticipated to be around 16 months.	Reduction
	Bank and bed features (outside the extent of permanent works – see **Operation Section** below) as far as practicable to be reinstated to existing profiles following completion of the permanent works. Prior to construction, any sedimentary bed features that may be would be mapped and photographed, and boulders (>0.5 m) would be surveyed, numbered and marked to show orientation relative to the channel bed. At onset of the construction phase, these sediments would be removed and stored. Upon completion of construction, the sedimentary bed features would be reinstated where practicable, with boulders placed according to the surveyed data.	Reduction
	River training walls to be lined with geotextile to prevent release of construction aggregate associated with the piling platform, to the channel.	Reduction

OPERATION

9.9.5. A summary of the mitigation measures to reduce the operational impacts is provided in **Table 9-5** and outlined in **Appendix E: Register of Environmental Actions and Commitments** of this ES Addendum.

Table 9-6 – Mitigation Measures for Operation

Source of impact	Mitigation Measure	Type of mitigation
North bank stabilisation piles	Design of drainage arrangements to prevent build-up of groundwater behind the installed piles, if necessary.	Prevention
North bank stabilisation including erosion protection.	Construct erosion protection to reflect natural bank profile.	Reduction
	Minimise the extent of hard engineered erosion protection.	Reduction
	Use sympathetic materials and construction techniques, likely to replicate existing bank roughness. Likely measures to be refined during detailed design.	Reduction
	Re-plant the reinstated made ground, using a locally appropriate tree, shrub and seed mix. Apply seeded biodegradable geotextile if outside of growing season, to reduce likelihood of erosion following reinstatement during out-of-bank flows. A total of 24 m of bank impacted by construction activities and lying outside of the proposed permanent scour protection is proposed to be reinstated (where possible) using green or green-grey erosion control methods set out in HR Wallingford (2017)[5] and planted to allow recovery of the riparian vegetation structure. Reinstate bed substrate to a pre-works comparable condition.	Reduction

[5] HR Wallingford (2017) Green approaches in river engineering, Supporting implementation of green infrastructure.

9.10 ASSESSMENT OF LIKELY SIGNIFICANT EFFECTS

CONSTRUCTION

Increased Sedimentation

9.10.1. The magnitude of the potential impacts associated with the Stabilisation Works is likely to be greater during periods of heavy rainfall. The greatest risk to increased sedimentation is most likely to be associated with runoff from cut and fill areas, working areas and haul roads that are required to facilitate the Stabilisation Works. Further risk is associated with repeated plant vehicle movements which could cause further ground disturbance.

9.10.2. Any increase in sedimentation from construction runoff would likely reduce shortly after completion of the works when bare areas are reinstated. The mitigation measures detailed in **Section 8.9** of this ES Addendum and within measures S-W1, S-W8, S-W9, S-W10, S-W12 and A-W15 of the **Outline CEMP** [**REP3-013** and **REP3-014**] would ensure the risk of increased sedimentation and potential effects to the watercourse is low. For example, as detailed in reference S-W9 of the **Outline CEMP** [**REP3-013** and **REP3-014**] the main contractor would set out how construction activities would be undertaken to ensure all risks to the water environment from material excavation and storage would be further developed as part of the Main Contractor's working method statements. The effects would be direct and temporary, with no long term or permanent impacts expected.

Pollution Risk

9.10.3. With the implementation of mitigation measures outlined within measures S-W1, S-W8, S-W10, S-W11, S-GS8 and S-GS13 of the **Outline CEMP** [**REP3-013** and **REP3-014**], it is considered unlikely that pollution of the River Coquet would occur. For example, as detailed in reference S-W10 of the **Outline CEMP** [**REP3-013** and **REP3-014**] the main contractor would be required to comply with the relevant sections of BS 6031:2009 Code of Practice for Earthworks with respect to protection of water quality and control of site drainage. Further measures to reduce pollution risk would be implemented, such as storing mechanical plant including generators in bunded areas when not in use as detailed as detailed in reference S-W11 of the **Outline CEMP** [**REP3-013** and **REP3-014**].

Construction Activities within Watercourses

9.10.4. Temporary works within or in close proximity to the River Coquet could result in damage to the banks resulting in short term increases to sediment loading and turbidity.

9.10.5. Potential impacts associated with construction works within the watercourse channels are considered to be direct and temporary as water quality within the watercourses would improve over time as sediments settle and any pollutants are treated by entrapment, dilution and natural processes.

Existing A1 and Road Bridge

9.10.6. The construction of the two working platforms/benches to the north of the River Coquet would require areas of both cut and fill. The maximum depths of excavation would be around 2.25 m and 1.5 m for the northerly and southerly platforms respectively. These excavations would therefore be expected to intercept groundwater and cause drawdown of the groundwater surface as a consequence of the associated groundwater drainage. This

could lead to subsidence in dewatered unconsolidated sediments (i.e. superficial deposits, including made ground).

9.10.7. However, considering the relatively shallow proposed excavations and being situated on the steep north bank of the river, the degree of groundwater interception and the consequent potential radius of influence of drawdown would be minimal.

River Coquet

9.10.8. The drawdown of the groundwater surface associated with drainage of the working platform excavations and the ground disturbance and compaction associated with the construction work would likely reduce shallow groundwater flow towards the River Coquet and, consequently, reduce groundwater baseflow to the river. However, the area potentially affected would be minimal compared to the size of the River Coquet and the impact would not be expected to be significant.

Geomorphology

9.10.9. The construction impacts on the sediment regime and natural fluvial processes could occur across the full range of flow conditions. Impacts from fine sediment ingress may be greatest during low flows, however, impacts on coarse sediment transport and erosion and deposition are likely to be greatest during higher and out-of-bank flows where the effects from the works on channel width would be greatest.

9.10.10. As described above, the duration of the works would be relatively short term (approximately 16 months for near-channel and in-channel works) and, once completed, the natural bed and banks outside the extent of any permanent works would be reinstated to their baseline cross-sectional profile. As such, impacts to the sediment regime and natural fluvial processes are considered localised, short term and reversible with the commitment to reinstatement following completion of the works.

9.10.11. The loss of some bank features are unlikely to be reversible through natural processes in the short-term. Bank features such as exposed roots, undercut banks, and exposed bedrock would have developed over a long period of time through the balance between fluvial bank erosion and stabilisation by tree growth.

9.10.12. Some bed deposits show indications of long-term stability and may only be transported small distances during rare large magnitude flow events. These features also act to promote deposition of finer sediments through sheltering. Where impacted, such deposits are unlikely to reform in the short-term through natural deposition but over time would develop if boulders exhibiting long-term stability can be replaced or reinstated at their original locations.

9.10.13. Sedimentary bed features that may be directly impacted by construction activities would be mapped prior to construction and sediment removed, stored and reinstated where practicable following construction. Specific measures would be implemented to ensure that any in-channel boulders, affected by the works, that are over 0.5 m are placed back in the same location, with the same orientation.

9.10.14. **Table 9-7** provides a summary of the likely significant effects associated with the Stabilisation Works during construction. Permanent effects to hydromorphology associated with the proposed bank protection are discussed as operational effects.

Table 9-7 – Assessment of Effects During Construction

Source of Impact	Comments	Magnitude of Impact	Significance of Effect
Increased Sedimentation	A temporary increase in sedimentation associated with the exposure and disturbance of surfaces and works either in or in close proximity to the River Coquet could lead to increased suspended solids and turbidity. River Coquet specific mitigation measures in **Section 8.9** of this ES Addendum, **Appendix E: Register of Environmental Actions and Commitments** of this ES Addendum and measures S-W1, S-W8, S-W9, S-W10, S-W12 and A-W15 of the **Outline CEMP** [**REP3-013 and 014**] would ensure minimal impact. For example, as detailed in reference S-W9 of the **Outline CEMP** [**REP3-013 and 014**] measures for managing excavated and stored material would be further developed as part of the Main Contractor's working method statements.	Minor adverse	Slight (not significant)
Pollution Risk	Fuel and other harmful substances from plant vehicles and disturbance of unidentified contaminants could lead to a temporary deterioration in water quality. With robust mitigation and spill containment measures proposed in measures S-W8, S-W10, S-W11, S-GS8 and S-GS13 of the **Outline CEMP** [**REP3-013 and 014**], discharge of significant volumes of harmful substances is unlikely to occur. Measures include, for example, that the main contractor would be required to comply with the relevant sections of BS 6031:2009 Code of Practice for Earthworks with respect to protection of water quality and control of site drainage as detailed in reference S-W10 of the **Outline CEMP** [**REP3-013 and 014**]. Further measures to reduce pollution risk would be implemented, such as storing mechanical plant including generators in bunded areas when not in use as detailed as detailed in reference S-W11 of the **Outline CEMP** [**REP3-013 and 014**].	Negligible	Neutral (not significant)
Construction Activities within Watercourse	The removal of bankside vegetation and disturbance to the riverbed and banks could lead to increased suspended solids and turbidity. Fuel or other harmful substances from plant vehicles could also lead to a deterioration in water quality. Mitigation measures proposed in S-W9, S-W10, S-W12, A-W15 and S-GS9 of the **Outline CEMP [REP3-013 and 014]** would ensure minimal impact. For example, works would be avoided during high flow events and intense rainfall to reduce the risk of fine sediment release as detailed in reference A-W15 of the **Outline CEMP** [**REP3-013 and 014]**	Negligible	Neutral (not significant)
Existing A1	Potential for subsidence due to groundwater drawdown associated with excavation of access and working platforms.	Negligible	Neutral (not significant)
River Coquet	Reduced groundwater baseflow associated with construction of working platforms.	Negligible	Neutral (not significant)
General construction activities associated with proposed design	Sediment regime: A temporary short-term increase in water turbidity and siltation of the channel substrate may occur due to a potential increase in fine sediment supply. The removal of vegetation, resulting in exposed earth, earthworks and excavation could contribute to the release of fine sediment. This sediment may be carried considerable distances downstream, altering the sediment regime with potential detrimental impacts on	Negligible	Neutral (not significant)

Source of Impact	Comments	Magnitude of Impact	Significance of Effect
	important aquatic habitats. Channel morphology: Limited, localised draping of bedforms with fine sediment as a result of increased fine sediment supply. This may settle between the cobbles and boulders and, where the water is shallow or the sediment is exposed during baseflow conditions, in-channel vegetation may establish. Any spawning gravels may be covered. These impacts are likely to be temporary and limited in duration, as relatively frequent flushing flows are likely to transfer and distribute this excess sediment downstream. Natural fluvial processes: Temporary increases in the extent of bare soil surfaces could result in localised changes to the quantity of flow entering the channel due to more rapid run-off, which has the potential to locally alter flow dynamics.		
Lower north bank piling platform and associated works, including temporary retaining wall/river training works	Sediment regime: Construction of the piling platform and associated works, including the temporary retaining wall/river training works, could create a short-term increase in the volume of fine sediment directly entering the channel and consequently increase turbidity. The restriction of flow and reduced channel width at all flows may alter the sediment transport capability of the river, enabling the transport of larger material at lower flows compared to the baseline. Impacts are likely to be temporary and reversible following completion of construction and reinstatement works. Channel Morphology: Bank and bed features would be degraded within the footprint of the works. Channel bed impacts may be reversible following the end of construction with mitigation provided to reinstate features where practicable, although any loss of bedrock may not be reversible. The impacts on banks are assessed under **Operation Section** below. Natural fluvial processes: The presence of the piling platform and associated works including the temporary retaining wall/river training works could alter the channel dynamics, which could result in localised increases in erosion and sediment transport rates. Impacts may cease following the end of construction.	Minor adverse	Slight (not significant)

OPERATION

Sedimentation

9.10.15. It is anticipated that any impacts on sedimentation during operation would be short-term whilst erosion controls are established, and bare soil surfaces are restored. **Table 9-6** provides a summary of the likely significant effects associated with sediment laden runoff.

River Coquet

9.10.16. The installation of piles for ground stabilisation would likely intercept groundwater and potentially reduce shallow groundwater flow towards the River Coquet. However, this would be mitigated by the use of spaced piles and, if necessary, incorporation of drainage to prevent build-up of groundwater behind the piles. In addition, the area potentially affected would be minimal compared to the size of the River Coquet and the impact would not be expected to be significant.

Groundwater Flooding

9.10.17. The potential for groundwater flooding on the upgradient side of ground stabilisation piles would be mitigated by the use of spaced piles and, if necessary, incorporation of drainage to prevent build-up of groundwater behind the piles. Consequently, no significant effects would be expected.

Geomorphology

9.10.18. Operational impacts are likely to be localised to the footprint of the erosion protection and reinstated made ground included for the north bank. These are summarised in **Table 9-6**. The changes would last for the design life of the bridge.

9.10.19. The upstream extent of the proposed erosion protection is within an area affected by the original bridge construction. The maximum length of natural bank which would be affected on the north bank by the proposed rock armour would be approximately 51 m. The length of disturbed bank affected on the north bank by the proposed rock armour would be approximately 11 m. A further 24 m of river bank disturbed during construction but outside of the footprint of the proposed rock armour would be as far as practicable reinstated to existing profiles following completion of the temporary works using green or green-grey erosion control methods set out in HR Wallingford (2017)[6] and planted to allow recovery of the riparian vegetation structure.

9.10.20. The existing undisturbed natural bank comprises of woodland, which has established over the top of colluvium. Along the north bank this includes the presence of boulder sized material derived from rockfall, likely to be similar in grade to the proposed scour protection. (**Image 2** and **Image 3**).

[6] HR Wallingford (2017) Green approaches in river engineering, Supporting implementation of green infrastructure.

Image 2. Rockfall along northern banks of the River Coquet 200 m downstream of proposed crossing

Image 3. Rockfall along northern banks of the River Coquet 200 m downstream of proposed crossing

9.10.21. However, the structure of the riparian zone would be impacted through the permanent loss of marginal bed and river bank features beneath the footprint of the proposed scour protection. This would include the loss of bank features such as exposed roots, undercut

banks, and exposed bedrock which would have developed over a long period of time through the balance between fluvial bank erosion and stabilisation by tree growth. These impacts are however localised to the footprint of the works.

9.10.22. Within the context of the reach as defined by the confined gorge channel typology (approximately 1.4 km), the proposed impacted bank length comprises approximately 2% of the total bank length within the gorge.

9.10.23. The River Coquet and Coquet Valley Woodlands SSSI (Swarland Burn to Coquet Mouth) is approximately 22.7 km in length (a total bank length of approximately 45 km). The proposed rock armour constitutes approximately 0.14% of the bank length (north bank) of the SSSI unit within which the Site is located.

9.10.24. The Coquet from Forest Burn to Tidal Limit WFD waterbody is 31.2 km long (which equates to approximately 62.4 km total bank length). The proposed rock armour constitutes approximately 0.1% of the water body length.

9.10.25. The proposed scour protection would be designed to replicate as far as practicable the existing bank profile, maintaining the overall cross-sectional area. However, minor localised differences in channel width at the margins would be expected between a natural bank and engineered bank within the footprint of the works. Scour protection bank roughness is likely to be less rough than the natural bank roughness due to the absence of trees. Chow (1959)[7] , suggests that rock armour may have a Manning's roughness of 0.04. In comparison, the existing bank roughness as observed on Site can be described as 'light brush and trees' which in winter has a roughness of 0.05 (Chow, 1959) but may be higher in summer.

9.10.26. The dynamics of water flow may be locally affected by the proposed scour protection at the channel margins adjacent to the scour protection. These changes may locally alter fluvial processes and the distribution of erosional and depositional features affecting the structure and substrate of the riverbed adjacent to the scour protection and immediately downstream. Hydraulic calculations, the methods of which are comparable to those set out in **Appendix 10.7: Geomorphological Assessment – River Coquet Parameter 10 Part A** of the ES [**APP-260**], show that any associated change in bank roughness between the natural bank and proposed scour protection is likely to have a negligible (6 mm reduction) impact on water depth during the 2-year flood event and by 0.03 m during the 200-year flood event.

9.10.27. The maximum change in velocity due to the change in roughness is an increase of around 0.3 m/s at the channel margin, during the 2-year flood event and an increase of 0.5 m/s during the 200-year flood event, presenting changes of 29% and 24% in velocity, respectively.

9.10.28. Increases in stream power are indicated to be a maximum of 8 W/m2 (24%) at the channel margin during the 2-year flood event and 31 W/m2 (24%) at the channel margin during the 200-year flood event.

[7] Chow. V.T., 1959. *Open Channel Hydraulics*. McGraw-Hill.

9.10.29. However, these increases are not across the whole channel. The results show a negligible change in velocity and stream power during the 2-year flood event and a small, ≤0.035 m/s reduction in velocity across the rest of the channel during the 200-year flood event.

9.10.30. Analysis of sediment entrainment competence shows that grain sizes entrained in the margins were typically within the gravel range. Decreasing bank roughness resulted in negligible change to the sediment entrained across the channel during the 2-year flood event, and ±1 mm during 200-year flood event.

9.10.31. The hydraulic calculations support the conclusion that there may be very localised, very minor changes in depositional features adjacent to the proposed scour protection but that there is unlikely to be a significant impact on depositional features away from the toe of the scour protection.

9.10.32. The detailed design stage will seek to minimise the extent of hard engineered erosion protection required and consider the use of sympathetic materials and construction techniques likely to provide increased roughness and improve riparian structure (such as vegetated rock armour).

9.10.33. The proposed works could create a short-term, intermittent increase in the volume of fine sediment directly entering the channel during storm events, until vegetation growth stabilises the surface. This may cause limited, localised draping of bedforms with fine sediment as a result of increased fine sediment supply. These impacts are likely to be temporary and limited in duration.

9.10.34. The protection of the bank may lead to a permanent but localised reduction in the availability of erodible sediment. Locally, the banks are not considered to be an important source of sediment for the channel.

9.10.35. The impact on the sediment regime and natural fluvial processes are assessed to be negligible, with any long-term effects very minor and localised to the area of permanent works. It is unlikely that there would be a significant change in the sediment regime due to the localised nature of the works, the existing limited sediment supply from the left bank and the marginal changes to the channel cross-section. The impact on channel morphology is considered minor adverse.

9.10.36. **Table 9-8** below provides a summary of the likely significant effects during operation of the Stabilisation Works.

Table 9-8 - Assessment of Effects During Operation

Source of Impact	Comments	Magnitude of Impact	Significance of Effect
Sedimentation	Prior to establishment, bare soil surfaces could temporarily lead to increased levels of suspended solids and turbidity in the water column. River Coquet specific mitigation measures in **Section 8.9** of this ES Addendum,	Negligible	Neutral (not significant)

Source of Impact	Comments	Magnitude of Impact	Significance of Effect
	Appendix E: Register of Environmental Actions and Commitments of this ES Addendum and measure A-W18 of the **Outline CEMP** [**REP3-013 and 014**] would ensure minimal impact. For example, the main contractor would reinstate vegetation post-construction with a mix of native tree species with an understorey, including reinstatement of the riparian zone. This would reduce the operational impacts of the River Coquet bridge on river flow and geomorphology.		
River Coquet	Reduced groundwater baseflow associated with ground stabilisation piling.	Negligible	Neutral (not significant)
Groundwater Flooding	No significant impact expected.	n/a	n/a
North bank stabilisation including erosion protection	Sediment regime: The protection of the north bank may lead to a permanent but localised reduction in the availability of erodible sediment. Locally, the north bank is not considered to be an important source of sediment for the channel. Channel morphology: Some north bank and near-bank bed features would be lost within the footprint of these works. The existing north bank profile would be reinstated so alterations in channel cross-section are anticipated to be minimal. Some alterations to channel roughness may occur. Any reduction in roughness compared to the existing tree lined bank may locally increase erosion rates. However, impacts are likely to be small and very localised to the channel margins and limited to the extent of the scour protection. Natural fluvial processes: The change in materials from which the north bank is composed would, by design, reduce the channel's ability to adjust and mature	Minor adverse	Slight (not significant)

Source of Impact	Comments	Magnitude of Impact	Significance of Effect
	riparian vegetation would be lost. Increased run off may occur locally due to immature vegetation.		

Impacts on the Fluvial Geomorphological Forms and Function Supporting the SSSI

9.10.37. The River Coquet and Coquet Valley Woodlands SSSI is designated for a variety of river types developing from upland mountain stream (Type IX: oligotrophic, mountains and moorland), through to lowland river (Flowing waters - Type V: principally a lowland type, widespread over resistant rocks in England and Wales). The citation[8] describes a range of aquatic flora and fauna that in many cases are specific to the river type and also rely upon the geomorphic forms and processes operating both within the scheme specific reach and upstream.

9.10.38. The citation states that below Rothbury, it is these reaches where the river cuts through sand, gravel and alluvium where richer and fine sediments support a greater diversity of aquatic plants. Specifically, water-crowfoot *Ranunculus fluitans* as being common on riffles while curled, perfoliate and horned pondweeds, branched and un-branched burweeds and alga reflect the base-rich nature of the river. On rocks, the mosses *Fontinalis antipyretica* and *Rhyncostegium lusitanicum* are found. Riverside shingle and sand habitats support an assemblage of ground beetles with several nationally scarce species including *Bembidion schuppeli*.

9.10.39. As described in **Table 9-7** and **Table 9-8** of this ES Addendum, channel morphology in the form of natural bank and sediment bedforms would be locally adversely impacted by the north bank stabilisation works. Both bedrock and a limited area of mobile sediment deposits would be disturbed by the temporary works, and a limited extent of bank would be modified permanently due to scour protection. Within the context of the SSSI, Unit Number 005, within which the proposed works are located, the extent of disturbance would be less than 0.2% of the approximate 45 km total bank length within the unit.

9.10.40. The construction of bank protection is unlikely to significantly alter the current or future sediment supply to the reach, nor significantly change either the reach's morphological behaviour, or the function of the reach as a sediment transfer zone. The Stabilisation Works are also considered unlikely to change the river typology which is determined by the confined gorge like channel and substantially bedrock bed.

[8] Natural England (2020), Designated Sites View, River Coquet and Coquet Valley Woodlands SSSI [Available Online] https://designatedsites.naturalengland.org.uk/PDFsForWeb/Citation/2000052.pdf [Accessed January 2021]

9.10.41. The impact from the Stabilisation Works are considered to be local to the works and therefore unlikely to impact the form or function of the river upstream or downstream beyond the immediate locality of the works.

9.10.42. The assessment above indicates a localised slight adverse impact on geomorphology based on the criteria set out in **Appendix 10.7: Geomorphological Assessment – River Coquet Parameter 10 Part A** of the ES [**APP-260**]. However, within the context of the SSSI, these localised geomorphological impacts are considered unlikely to extend significantly beyond the locality of the works and are therefore unlikely to significantly affect the supporting features of the SSSI. The assessment will be refined as detailed in **paragraph 9.13.1** of this ES Addendum.

9.11 MONITORING

9.11.1. The monitoring requirements for Road Drainage and the Water Environment have changed due to the Stabilisation Works. Visual survey of the bed and banks would be undertaken to understand the degree and nature of change following any high flow events during construction to verify the findings of the assessment set out in this ES Addendum. This should be undertaken by an appropriately qualified geomorphologist or environmental clerk of works with appropriate fluvial geomorphological experience.

9.11.2. Existing monitoring is provided in Table 5-1 of the **Outline CEMP** [**REP3-013** and **REP3-014**] including, for example, monitoring watercourses within 50 m of the earthworks to identify any pollution. In addition to this existing monitoring, during construction regular visual inspections during periods of heavy rain should be undertaken to identify if silt water runoff is discharging into the River Coquet. This has been included as part of **Appendix E: Register of Environmental Actions and Commitments** of this ES Addendum.

9.11.3. The remaining text within Section 10.11, Chapter 10: Road Drainage and the Water Environment Part A of the ES [APP-050] remains unchanged and valid.

9.12 UPDATED DMRB GUIDANCE

9.12.1. Since the assessments in the ES were completed, the DMRB methodology was superseded and replaced with updated guidance as detailed in **Section 10.4, Chapter 10: Road Drainage and the Water Environment Part A** of the ES [**APP-050**]. A DMRB sensitivity test for likely significant effects showed that the new guidance did not affect the conclusions of the Road Drainage and the Water Environment assessment in **Chapter 10: Road Drainage and the Water Environment Part A** of the ES [**APP-050**] and similarly does not affect the conclusions presented in this ES Addendum.

9.13 FURTHER WORK

9.13.1. The impact on sediment regime, natural fluvial processes and morphology will be refined and aid the design of suitable scour protection measures. This will be reported in a further iteration of this Chapter in the ES Addendum or Technical Note (as appropriate) that will be submitted to the Examination.

10 GEOLOGY AND SOILS

10.1 INTRODUCTION

10.1.1. **Chapter 11: Geology and Soils Part A** of the ES [**APP-052**] considers the likely significant effects of Part A on Geology and Soils.

10.1.2. This section of the ES Addendum considers only the likely significant effects of the Stabilisation Works on Geology and Soils.

10.2 COMPETENT EXPERT EVIDENCE

10.2.1. As detailed in **Table 10-1**, the professionals contributing to the production of this assessment have sufficient expertise to ensure the completeness and quality of this assessment. The table sets out the details of expertise where this is different to those presented in the ES.

Table 10-1 – Geology and Soils Professional Competence

Name	Role	Qualifications and Professional Membership	Experience
Heather Biggin	Author	MSci (Hons) Geological Sciences MSc Engineering Geology Chartered Geologist (CGeol), Geological Society of London	15 years of geological experience – A14 Cambridge to Huntingdon – A9 Project 7 – Aberdeen Western Peripheral Route (AWPR) – Carradale to Crossaig Power Line Upgrade – Bardon Quarry Extension – Murchison Dam Spillway Upgrade – Awaroa 4 Opencast Coal Mine
Chris Jackson	Reviewer	BSc (Hons) Geology MSc Geotechical Engineering Design & Management. EurGeol, CGeol, FGS. RoGEP Specialist	16 years of geological experience – A628 Landslide Stabilisation – M1 Jct 37 Stabilisation – A1M West Cornforth Stabilisation – A19 Cramlington Stabilisation – A1 GNWB Landslip Remediation

Name	Role	Qualifications and Professional Membership	Experience
			– Highways England Geotechnical Maintenance Liaison Engineer Operations – Clifton Ings CAT A Reservoir Dam Design – Keswick Flood Alleviation scheme – Wakefield Flood Alleviation Scheme – Todmorden Flood Alleviation scheme

10.3 LEGISLATIVE AND POLICY FRAMEWORK

10.3.1. The legislative and policy framework for Geology and Soils has not changed since the publication of the ES. Therefore, the text within **Section 11.3, Chapter 11: Geology and Soils Part A** of the ES [**APP-052**] remains valid.

10.4 ASSESSMENT METHODOLOGY

10.4.1. In order to ensure a comparable assessment with the ES, the assessment methodology followed for Geology and Soils has not changed in response to the Stabilisation Works. Therefore, the text within **Section 11.4, Chapter 11: Geology and Soils Part A** of the ES [**APP-052**] remains unchanged and valid.

10.5 ASSESSMENT ASSUMPTIONS AND LIMITATIONS

10.5.1. The assessment assumptions and limitations for Geology and Soils for the Stabilisation Works have not changed from the ES. Therefore, the text within **Section 11.5, Chapter 11: Geology and Soils Part A** of the ES [**APP-052**] remains unchanged and valid.

10.6 STUDY AREA

10.6.1. The Study Area for the Geology and Soils assessment has changed for the Stabilisation Works due to the extended Order limits as shown in **Figure 2: Location Plan and Compensatory Habitat Location** in **Appendix A** of this ES Addendum.

10.7 BASELINE CONDITIONS

10.7.1. The baseline for the Geology and Soils assessment has largely not changed for the Stabilisation Works. Therefore, the text within **Section 11.7, Chapter 11: Geology and Soils Part A** of the ES [**APP-052**] remains unchanged and valid, with the addition of the following information.

10.7.2. It was identified in December 2019 that supplementary ground investigation would be required to inform the detailed design work for the Scheme. This ground investigation was

undertaken between January and March 2020 followed by analysis of the results with the first draft report being available on 17 July 2020 (therefore after the application had been submitted on 7 July 2020). The results were reviewed over the summer of 2020, with the latest report being available on 2 December 2020. The ground conditions recorded are as per **Chapter 11: Geology and Soils Part A** of the ES [**APP-052**] and are summarised below.

10.7.3. Ground conditions within the valley comprised an intermixed sequence of Made Ground associated with the original bridge construction, superficial colluvial (landslip) and localised alluvial deposits. These were typically described as soft to firm clay. Bedrock of the Stainmore Formation, comprising cyclical sequences of limestone, siltstone, mudstone, sandstone and coal were encountered, close to rockhead this was typically weathered and included localised bands of residual clay.

10.7.4. A four-stage model for development of the recognised slope failure mode at the site involves: downcutting of the river valley, undercutting and block failure of the more competent units, large-scale block failure with release along weaker planes, relaxation of slope angles to a quasi-stable state, ongoing toe erosion and potential changes in groundwater triggering gradual ongoing instability.

10.7.5. The Stabilisation Works would change the land-take requirements for the Scheme. Additional permanent land take of 0.28 ha of broadleaved woodland (non-agricultural land) within the Coquet River Felton Park LWS, adopted as ancient woodland for the purpose of mitigation and compensation, would be required. Therefore, permanent land take of 3.1 ha of Subgrade 3b agricultural land would be required to provide compensatory habitat. The temporary and permanent land-take associated with Part A would therefore comprise a total area of approximately 245.38 ha, of which approximately 175.1 ha is currently in agricultural use. The permanent land-take associated with Part A would comprise an area of 170.38 ha of which 112.1 ha is in agricultural use. The temporary land-take associated with Part A comprises of an area of approximately 75 ha of which 63 ha is in agricultural use.

10.8 POTENTIAL IMPACTS

CONSTRUCTION

10.8.1. During construction, the activities anticipated for the Stabilisation Works that would impact land take are:

a. Creation of access to the slope north of the River Coquet and working platforms for plant required to install slope stabilisation and foundations for the new bridge which would require an additional 0.28 ha of land take of woodland (non-agricultural). The land would be planted in line with the revised Ancient Woodland Strategy Part A for Change Request (submitted at Deadline 4) after construction meaning the land would be acquired permanently.

b. Additional compensatory habitat which would require an additional 3.1 ha of permanent land take of Subgrade 3b agricultural land.

10.8.2. All other remaining impacts described within **Section 11.8, Chapter 11: Geology and Soils Part A** of the ES [**APP-052**] remain unchanged and are valid.

OPERATION

10.8.3. There are no additional operational impacts of the Stabilisation Works on Geology and Soils, therefore the impacts within **Section 11.8, Chapter 11: Geology and Soils Part A** of the ES [**APP-052**] remain unchanged and valid.

10.9 DESIGN, MITIGATION AND ENHANCEMENT MEASURES

10.9.1. In addition to the measures detailed within **Section 11.8, Chapter 11: Geology and Soils Part A** of the [**APP-052**], the following mitigation measures would be implemented..

CONSTRUCTION

10.9.2. Slope stability monitoring instrumentation in the form of Shape Accel-Arrays was installed as part of the recent ground investigation. This would be used during construction to monitor ground movement and hence minimise the impact of the slope instability on construction. This has been included within **Appendix E: Register of Environmental Actions and Commitments** of this ES Addendum.

10.9.3. The mitigation requirements for Soils and Geology have not changed due to the Stabilisation Works. Therefore, the text within **Section 11.9, Chapter 11: Geology and Soils Part A** of the ES [**APP-052**] remains unchanged and valid.

OPERATION

10.9.4. Slope stabilisation (including scour protection) as proposed within this ES Addendum would minimise the risk of post-construction slope instability during operation of the Scheme.

10.10 ASSESSMENT OF LIKELY SIGNIFICANT EFFECTS

CONSTRUCTION

Ground Stabilisation

10.10.1. In relation to ground stabilisation, the assessment of likely significant effects on Geology and Soils during construction have not changed due to the Stabilisation Works. Therefore, the text within **Section 11.10, Chapter 11: Geology and Soils Part A** of the ES [**APP-052**] remains unchanged and valid. No additional risks were identified during the recent ground investigation.

Temporary and Permanent Loss of Agricultural Soil

10.10.2. The temporary land take would remain the same as detailed within **Section 11.10, Chapter 11: Geology and Soils Part A** of the ES [**APP-052**] remains unchanged and valid.

10.10.3. Part A would result in the total permanent agricultural land take of approximately 112.1 ha. The proposed Stabilisation Works would result in permanent land take of 0.28 ha of woodland; however, this is non-agricultural land. A total of 3.1 ha Subgrade 3b of permanent land would be required as a result of additional compensatory habitat associated with the Stabilisation Works. The magnitude of change is major with medium sensitivity therefore there would be a Moderate Adverse effect for Subgrade 3b which is the same as reported in **Section 11.10, Chapter 11: Geology and Soils Part A** of the ES [**APP-052**]. The remaining agricultural soil types considered in **Chapter 11: Geology and Soils Part A** of the ES [**APP-052**] would not be impacted as a result of the Stabilisation Works.

Therefore, the text within **Section 11.10, Chapter 11: Geology and Soils Part A** of the ES [**APP-052**] remains unchanged and valid.

OPERATION

10.10.4. The assessment of likely significant effects on Geology and Soils during operation have not changed due to the Stabilisation Works (including scour protection). Therefore, the text within **Section 11.10, Chapter 11: Geology and Soils Part A** of the ES [**APP-052**] remains unchanged and valid. No additional risks were identified during the recent ground investigation.

10.11 MONITORING

10.11.1. As detailed in **Paragraph 10.9.2**, Slope stability monitoring instrumentation in the form of Shape Accel-Arrays was installed as part of the recent ground investigation. This would be used during construction to monitor ground movement and hence minimise the impact of the slope instability on construction.

10.11.2. The operational monitoring requirements for Geology and Soils have not changed due to the Stabilisation Works. Therefore, the text within **Section 11.11, Chapter 11: Geology and Soils Part A** of the ES [**APP-052**] remains valid.

10.12 UPDATED DMRB GUIDANCE

10.12.1. Since the assessments in the ES were completed, the DMRB methodology was superseded and replaced with updated guidance as detailed in **Section 11.10, Chapter 11: Geology and Soils Part A** of the ES [**APP-052**]. A DMRB sensitivity test for likely significant effects was undertaken as detailed in **Section 11.10, Chapter 11: Geology and Soils Part A** of the ES [**APP-052**]. The findings of this sensitivity test were that the conclusions of the ES would remain unchanged.

11 POPULATION AND HUMAN HEALTH

11.1 INTRODUCTION

11.1.1. **Chapter 12: Population and Human Health Part A** of the ES [**APP-054**] considers the likely significant effects of Part A on Population and Human Health. This comprises permanent land take and potential impacts on agricultural land holdings.

11.1.2. This section of the ES Addendum considers only the likely significant effects of the Stabilisation Works on Population and Human Health. The assessment has evolved since **Appendix B: Summary of Proposed Changes to Application**, and now considers both construction and operational impacts.

11.2 COMPETENT EXPERT EVIDENCE

11.2.1. As detailed in **Table 11-1**, the professionals contributing to the production of this assessment have sufficient expertise to ensure the completeness and quality of this assessment. The table sets out the details of expertise where this is different to those presented in the ES.

Table 11-1 – Population and Human Health Professional Competence

Name	Role	Qualifications and Professional Membership	Experience
Sheri Shai	Author	BSc (Hons) Environmental Science MSc Environmental Consultant Graduate membership of the Institute of Environmental Management & Assessment	Over three years of relevant Environment Impact Assessment (EIA) experience – Population and Human Health specialist on A27 Arundel Bypass – Population and Human Health specialist on A5 Western Transport Corridor
Sophie Collins	Reviewer	BSc (Hons) Bachelor of Science MSc Master of Science AIEMA Affiliate member of Institute of Environmental Management and Assessment	Principal Consultant Seven years' experience as a Socio-economic assessor and project manager, inputting to diverse mixed-use schemes and infrastructure projects across the UK for public and private sector clients. Other recent relevant experience includes: – A1 Birtley to Coal House scheme - preparation and review of the People and

Name	Role	Qualifications and Professional Membership	Experience
			Communities chapters for Scoping and Preliminary Environmental Information Report. – Preparation of the Population and Human Health Environmental Assessment Report chapters - A27 Arundel Bypass, A27 Worthing and Lancing and A30 Chiverton to Carland Cross.
Mike Roberts	Quality Assurance	BSc (Hons) Bachelor of Science MSc Master of Science (MIEnvSc) Member of the Institute of Environmental Science CEnv Chartered Environmentalist,	Associate Director Over 14 years' experience in the preparation of EIA with particular experience in the assessment of major infrastructure schemes across the UK, particularly the Highways Sector. Relevant experience includes: – A96 Dualling Hardmuir to Fochabers – Environmental Coordinator and discipline lead for the assessment of impacts to People and Communities. – A9 Dualling Northern schemes - Environmental Coordinator and discipline lead for the assessment of impacts to People and Communities (Walkers Cyclists and Horse-riders and Community Severance).

11.3 LEGISLATIVE AND POLICY FRAMEWORK

11.3.1. The legislative and policy framework for Population and Human Health has not changed since the publication of the ES. Therefore, the text within **Section 12.3, Chapter 12: Population and Human Health Part A** of the ES [**APP-054**] remains valid.

11.4 ASSESSMENT METHODOLOGY

11.4.1. In order to ensure a comparable assessment with the ES, the assessment methodology followed for Population and Human Health has not changed in response to the Stabilisation Works. Therefore, the text within **Section 12.4, Chapter 12: Population and Human Health Part A** of the ES **[APP-054**] and **Appendix 12.1: Agricultural Assessment Part A** of the ES [**APP-266**] remains unchanged and valid.

11.5 ASSESSMENT ASSUMPTIONS AND LIMITATIONS

11.5.1. The assessment assumptions and limitations for Population and Human Health for the Stabilisation Works have not changed from the ES. Therefore, the text within **Section 12.5, Chapter 12: Population and Human Health Part A** of the ES [**APP-054**] **and Appendix 12.1: Agricultural Assessment Part A** of the ES [**APP-266**] remains unchanged and valid.

11.6 STUDY AREA

11.6.1. The Study Area parameters for agricultural land within the Population and Human Health assessment within **Section 12.6, Chapter 12: Population and Human Health Part A** of the ES [**APP-054**] are limited to within the existing Order limits of Part A. Therefore, the Study Area is expanded to include the permanent land required for the Stabilisation Works and the permanent land required for the additional compensatory habitat as shown in **Figure 2: Location Plan and Compensatory Habitat Location** in **Appendix A: Figures** of this Addendum. The additional permanent land for the additional compensatory habitat is part of an agricultural land holding already considered within the existing baseline.

11.7 BASELINE CONDITIONS

11.7.1. The Study Area for the Population and Human Health assessment has not changed for the Stabilisation Works and additional compensatory habitat, but the land within the Study Area has expanded. However, the additional permanent land required for the compensatory habitat is part of an agricultural land holding already considered within the existing baseline, which has not changed. Therefore, the text within **Section 12.7, Chapter 12: Population and Human Health Part A** of the ES [**APP-054**] and **Appendix 12.1: Agricultural Assessment Part A** of the ES [**APP-266**] remains unchanged and valid.

11.7.2. Permanent land take required to accommodate the compensatory habitat to replace the woodland lost in the Coquet River Felton Park LWS as a result of the Stabilisation Works t is detailed in **Chapter 7: Biodiversity** of this ES Addendum. This additional, permanent land take is from West Moor Farm. West Moor Farm is an agricultural land holding of approximately 211.53 ha, with a rotation of wheat, barley, rape and oats and identified as a holding of low sensitivity due to its size.

11.8 POTENTIAL IMPACTS

CONSTRUCTION

11.8.1. During construction, the anticipated impact of the Stabilisation Works is the additional permanent loss (approximately 3.1 ha) of agricultural land from West Moor Farm. This is as a result of the additional land for compensatory habitat, which is to be located approximately 360 m south of the River Coquet and west of the A1. This is likely to result in a further reduction in profitability for the agricultural land holding to that stated in **Table 12-42**, **Chapter 12: Population and Human Health Part A** of the ES [**APP-054**].

11.8.2. All other impacts during construction, detailed within **Section 12.8, Chapter 12: Population and Human Health Part A** of the ES [**APP-054**], remain unchanged.

OPERATION

11.8.3. No further operational impact is anticipated due to the additional permanent land take reported above.

11.8.4. All other impacts during operation, detailed within **Section 12.8, Chapter 12: Population and Human Health Part A** of the ES [**APP-054**], remain unchanged are valid.

11.9 DESIGN, MITIGATION AND ENHANCEMENT MEASURES

11.9.1. The mitigation requirements for Population and Human Health have not changed due to the Stabilisation Works. Therefore, the text within **Section 12.9, Chapter 12: Population and Human Health Part A** of the ES [**APP-054**] and **Appendix 12.1: Agricultural Assessment Part A** of the ES [**APP-266**]. The mitigation measures outlined within **Appendix 12.1: Agricultural Assessment Part A** (as referenced by **paragraph 12.9.21** of **Chapter 12: Population and Human Health Part A of the ES** [**APP-054**]) would also be applied to the additional land required to accommodate the works if necessary.

CONSTRUCTION

11.9.2. Pursuant to the Compensation Code, compensation for additional permanent land take for compensatory habitat would be agreed with West Moor Farm whose land would be permanently acquired to accommodate the compensatory habitat. This has been included within **Appendix E: Register of Environmental Actions and Commitments** of this ES Addendum.

OPERATION

11.9.3. No further mitigation measures are proposed during the operational phase of the revised Scheme.

11.10 ASSESSMENT OF LIKELY SIGNIFICANT EFFECTS

CONSTRUCTION

11.10.1. West Moor Farm is of low sensitivity as stated in **Appendix 12.1: Agricultural Assessment**, Table 4 of the ES [**APP-266**]. The additional compensatory habitat is anticipated to have an adverse impact on West Moor Farm due to additional permanent land loss and the resulting impact on potential reduced profitability and viability for the agricultural land holding. The total proportion of the agricultural land holding area required, including that assessed in the ES and in this ES Addendum is less than 10% of the total area of the overall land holding. As reported in **Section 12.10, Chapter 12: Population and Human Health Part A** of the ES [**APP-054**], and with consideration of the additional permanent land take, severance is not anticipated. Therefore, the magnitude of impact on West Moor Farm is considered to be low, resulting in a **Minor Adverse** effect (**not significant**).

OPERATION

11.10.2. As stated in the construction section above, the Stabilisation Works is anticipated to have a direct permanent Minor Adverse effect (not significant) on West Moor Farm as a result of additional permanent land take reducing the profitability of the agricultural land holding. No

further significant effects are anticipated as a result of the Stabilisation Works during operation of the revised Scheme.

11.11 MONITORING

11.11.1. The monitoring requirements for Population and Human Health have not changed due to the Stabilisation Works. Therefore, the text within **Section 12.11, Chapter 12: Population and Human Health Part A** of the ES [**APP-054**] remains unchanged and valid.

11.12 UPDATED DMRB GUIDANCE

11.12.1. Since the assessments in the ES were completed, the DMRB methodology was superseded and replaced with updated guidance as detailed in **Section 12.4, Chapter 12: Population and Human Health Part A**, of the ES [**APP-054**].

11.12.2. As stated in **Table 2, Appendix 4.5: DMRB Sensitivity Test** of the ES [**APP-054**], the categorisation of agricultural land holding sensitivity assessment is currently based on size and type of holding and the updated DMRB guidance bases sensitivity on the frequency of use of land and access.

11.12.3. The criteria used for assessment of agricultural land holdings in the assessment above is based on industry best practice and is more detailed than that required under the updated DMRB guidance. Although there are differences, they both give an indication as to the importance of the land, access and the viability of the land holding. Hence, the sensitivity of West Moor Farm remains unchanged and the assessment undertaken is considered to be robust based on the information provided in **Appendix 12.1: Agricultural Assessment Part A** of the ES [**APP-266**].

12 MATERIAL RESOURCES

12.1 INTRODUCTION

12.1.1. **Chapter 13: Material Resources Part A** of the ES [**APP-056**] considers the likely significant effects of Part A on Material Resources (materials and waste). This comprises an assessment of material resource consumption and waste generation and disposal during the construction phase and first year of operation of Part A.

12.1.2. This section of the ES Addendum considers only the likely significant effects from materials and waste as a result of the Stabilisation Works. As detailed in **Appendix B: Summary of Proposed Changes to Application** of this ES Addendum, the Stabilisation Works are not anticipated to have an impact on Material Resources during operation and therefore this has not been considered in this chapter.

12.2 COMPETENT EXPERT EVIDENCE

12.2.1. The competent expert advice for the Material Resources assessment has not changed for this sensitivity assessment. Therefore, the text within **Section 13.2, Chapter 13: Material Resources Part A** of the ES [**APP-056**] remains unchanged and valid.

12.3 LEGISLATIVE AND POLICY FRAMEWORK

12.3.1. The legislative and policy framework for Material Resources has not changed since the publication of the ES. Therefore, the text within **Section 13.3, Chapter 13: Material Resources Part A** of the ES [**APP-056**] remains valid.

12.4 ASSESSMENT METHODOLOGY

12.4.1. In order to ensure a comparable assessment with the ES, the assessment methodology followed for Material Resources has not changed in response to the proposed Stabilisation Works. Therefore, the text within **Section 13.4, Chapter 13: Material Resources Part A** of the ES [**APP-056**] remains unchanged and valid.

12.5 ASSESSMENT ASSUMPTIONS AND LIMITATIONS

12.5.1. The assessment assumptions and limitations for Material Resources for the construction phase for the Stabilisation Works have not changed from the ES. Therefore, the text within **Section 13.5, Chapter 13: Material Resources Part A** of the ES [**APP-056**] remains unchanged and valid.

12.6 STUDY AREA

12.6.1. The primary Study Area described in **Chapter 13: Material Resources Part A** of the ES [**APP-056**] is extended slightly to incorporate the changes to the Order limits associated with the Stabilisation Works as shown in **Figure 2: Location Plan and Compensatory Habitat Location** in **Appendix A: Figures** of this ES Addendum. However, the change to the Order limits (and therefore primary Study Area) would not affect the overall assessment of Material Resources.

12.6.2. The secondary Study Area for the Material Resources assessment has not changed in response to the Stabilisation Works. This is because the Secondary Study area extends to the availability of construction and recovered material resources within the North East

region of England (Northumberland, Tyne and Wear, Durham and the Tees Valley) and the UK, and the capacity of waste management facilities in the North East of England. Therefore, the text within **Section 13.6, Chapter 13: Material Resources Part A** of the ES [**APP-056**] remains unchanged and valid.

12.7 BASELINE CONDITIONS

12.7.1. The baseline for the Material Resources assessment has not changed for the Stabilisation Works. Therefore, the text within **Section 13.7, Chapter 13: Material Resources Part A** of the ES [**APP-056**] remains unchanged and valid.

12.8 POTENTIAL IMPACTS

CONSTRUCTION

12.8.1. During construction, the anticipated impacts of the Stabilisation Works are:

a. Consumption of natural and non-renewable resources; and

b. Reduction in landfill capacity.

12.8.2. All other impacts during construction, detailed within **Section 13.8, Chapter 13: Material Resources Part A** of the ES [**APP-056**], remain unchanged are valid.

12.9 DESIGN, MITIGATION AND ENHANCEMENT MEASURES

12.9.1. In addition to the measures detailed within **Section 13.9, Chapter 13: Material Resources Part A** of the [**APP-056**], the following design reuse measure is expected to be implemented. Subject to a finalised design, professional judgement strongly indicates that this proposed measure is viable:

12.9.2. Where site-won material meets re-use criteria (as described in **paragraph 12.10.6** and **12.10.7** of this ES Addendum), it would be retained within the revised Scheme for use within, for example, footway and bridleway construction, or surfacing materials. This has been included within **Appendix E: Register of Environmental Actions and Commitments** of this ES Addendum.

12.10 ASSESSMENT OF LIKELY SIGNIFICANT EFFECTS

CONSTRUCTION: MATERIALS

12.10.1. The following materials are expected – on a reasonable worst case assessment basis - to be required during construction for the Stabilisation Works, however are subject to amendment through the detailed design process:

a. 500 m^3 concrete for piling;

b. 1,200 m^3 rock armour (aggregate) for stone gabion wall;

c. 93 m^3 grey-green bank protection (e.g. a geotextile turf type solution);

d. 3,500 m^3 temporary stone for piling platforms (aggregate);

e. Temporary wall of approx. 765 m^3 constructed from Legato bocks for temporary river training works;

f. 162 m^3 gabion mattress underlying the temporary river training works; and

g. 2,100 m^3 imported earthworks, based on the cut and fill deficit.

12.10.2. Primary materials required for the Stabilisation Works are a finite resource, but are generally available (for example, aggregate and concrete) through local and regional supply. It is therefore anticipated that ≤50% of the primary materials would be sourced nationally, with the larger proportion of primary materials being acquired from (for example) quarried or other sources local to the works (as presented in **Table 13-15, Chapter 13: Material Resources Part A** of the ES [**APP-056**], and as set out in the **Outline CEMP** [**REP3-013 and 014**]). It is also noted that any surplus earthworks generated as part of the main Scheme, would (subject to chemical and geotechnical quality) be available to use on the Stabilisation Works, further reducing adverse impacts from primary material consumption.

12.10.3. At the time of writing, no information was available on the percentage of secondary / recycled content of the materials required for the Stabilisation Works. However, it is expected that as part of mitigation measures outlined in **Section 13.9.3, Chapter 13: Material Resources Part A** of the ES [**APP-056**], use of secondary and recycled materials (e.g. concrete or aggregate) would minimise the consumption of primary materials in line with the regional target of 26% indicated in **Table 13-4, Chapter 13: Material Resources Part A** of the ES [**APP-056**] and as detailed in the **Outline CEMP** [**REP3-013 and 014].**

12.10.4. Accordingly, professional judgement, based on the scale and nature of the additional works (in combination with the assessment criteria), has been used to assert that the additional material resources required during the construction phase are not expected to affect the findings reported in **Section 13.10, Chapter 13: Material Resources Part A** of the ES [**APP-056**], or for the Scheme as reported in **Table 16-8, Chapter 16 Assessment of Cumulative Effects** of the ES [**APP-062**].

CONSTRUCTION: ARISINGS / WASTE

12.10.5. The following arisings are expected to be generated during construction of the Stabilisation Works:

a. 1,000 tonnes pile arisings (this equates to approximately 800 m^3 using the WRAP conversion factor)[9]; and

b. 3,500m^3 temporary stone for piling platforms (aggregate).

12.10.6. Subject to detailed design, all pile arisings that are chemically and geotechnically suitable would be recovered and reused within the revised Scheme. Subject to further design work, there is also potential for a large proportion of (and potentially all) the stone used for the temporary piling platforms, to be reused within the Order limits. The Legato blocks are suitable for reuse on other schemes, however if they were sent to landfill this would not change the findings of the assessment.

12.10.7. Therefore, based on the proposed reuse of materials and arisings on the proposed additional works. Waste infrastructure is considered to have sufficient capacity to accommodate waste from the Stabilisation Works. Furthermore, the reduction or alteration in the regional capacity of waste infrastructure is anticipated to be ≤1%.

[9] Waste recording and reporting guidance document https://www.wrap.org.uk/sites/files/wrap/Reporting%20Guidance.pdf

12.10.8. Professional judgement has been used, based on the scale and nature of the additional works (in combination with the assessment criteria used), to assert that the quantity of arisings generated during the construction phase are not expected to affect the findings reported in **Section 13.10, Chapter 13: Material Resources Part A** of the [**APP-056**], or for the Scheme as reported in **Table 16-8, Chapter 16 Assessment of Cumulative Effects** of the ES [**APP-062**].

12.11 MONITORING

12.11.1. The monitoring requirements for Material Resources have not, due to the Stabilisation Works, changed. Therefore, the text within **Section 13.11, Chapter 13: Material Resources Part A** of the ES [**APP-056**] remains unchanged and valid.

12.12 UPDATED DMRB GUIDANCE

12.12.1. Since the assessments in the ES were completed, the DMRB methodology was superseded and replaced with updated guidance as detailed in **Section 13.4, Chapter 13: Material Resources Part A** of the ES [**APP-056**]. A DMRB sensitivity test for likely significant effects has been undertaken. These changes are not expected to affect the outcome of the DMRB sensitivity test as detailed in **Section 13.4, Chapter 13: Material Resources Part A** of the ES [**APP-056**].

13 CLIMATE

13.1 INTRODUCTION

13.1.1. **Chapter 14: Climate Part A** of the ES [**APP-058**] considers the likely significant effects of Part A on Climate. This comprises an assessment of the anticipated greenhouse gas (GHG) emissions generated through construction and operation and the vulnerability of Part A to climate change from extreme weather and long-term climate change.

13.1.2. This section of the ES Addendum considers only the likely significant effects of the Stabilisation Works on GHG emissions generated at the construction phase. As outlined in **Appendix B: Summary of Proposed Changes to Application** of this ES Addendum, operational greenhouse gas emissions and construction and operational phase vulnerability of Part A to climate change has been scoped out in relation to the Stabilisation Works.

13.2 COMPETENT EXPERT EVIDENCE

13.2.1. The competent expert advice for the Climate assessment has not changed for this assessment. The text within **Section 14.2, Chapter 14: Climate Part A** of the ES [**APP-058**] remains unchanged and valid.

13.3 LEGISLATIVE AND POLICY FRAMEWORK

13.3.1. The legislative and policy framework for Climate has not changed since the publication of the ES. Therefore, the text within **Section 14.3, Chapter 14: Climate Part A** of the ES [**APP-058**] remains valid.

13.4 ASSESSMENT METHODOLOGY

13.4.1. In order to ensure a comparable assessment with the ES, the assessment methodology followed for Climate has not changed in response to the Stabilisation Works. Therefore, the text within **Section 14.4, Chapter 14: Climate Part A** of the ES [**APP-058**] relevant to the assessment of GHG emissions for the construction phase remains unchanged and valid.

13.5 ASSESSMENT ASSUMPTIONS AND LIMITATIONS

13.5.1. The assessment assumptions and limitations relevant to the GHG emissions for the construction phase off the Stabilisation Works have not changed from the ES. Therefore, the text within **Section 14.5, Chapter 14: Climate Part A** of the ES [**APP-058**] remains unchanged and valid.

13.5.2. In addition, the following assumptions and limitation has been identified:

a. It is assumed that the temporary construction materials for the river training / retaining walls would be Legato blocks made of pre-cast high strength concrete;

b. The grey-green bank protection (a geotextile and turf solution) has been recorded in the Highways England Carbon Tool as geotextile; and

c. Data on the anticipated fuel usage of plant and construction equipment was not available for the Stabilisation Works. This data gap is not expected to materially affect the GHG emissions calculations.

13.6 STUDY AREA

13.6.1. The Study Area for the Climate assessment has not changed for the Stabilisation Works. Therefore, the text within **Section 14.6, Chapter 14: Climate Part A** of the ES [**APP-058**] relevant to construction emissions remains unchanged and valid.

13.7 BASELINE CONDITIONS

The baseline for the Climate assessment has not changed for the Stabilisation Works. Therefore, the text within **Section 14.7, Chapter 14: Climate Part A** of the ES [**APP-058**] remains unchanged and valid.

13.8 POTENTIAL IMPACTS

CONSTRUCTION

13.8.1. During construction, the anticipated impacts of the Stabilisation Works are:

a. Increases in GHG emissions associated with construction activities, such as manufacturing of materials and construction processes

13.8.2. All other impacts during construction, detailed within **Section 14.8, Chapter 14: Climate Part A** of the ES [**APP-058**], remain unchanged are valid.

13.9 DESIGN, MITIGATION AND ENHANCEMENT MEASURES

13.9.1. The construction phase measures for the Climate assessment has not changed for the Stabilisation Works. Therefore, the text within **Section 14.9, Chapter 14: Climate Part A** of the ES [**APP-058**] remains unchanged and valid. Additional mitigation measures are not required as a result of the Stabilisation Works.

13.10 ASSESSMENT OF LIKELY SIGNIFICANT EFFECTS

CONSTRUCTION

13.10.1. The main source of GHG emissions during construction of the Stabilisation Works would be from embedded carbon in the construction materials and their associated transportation. The materials identified by the main contractor are detailed below, however are subject to amendment through the detailed design process, but represent a reasonable assessment basis:

a. 500 m^3 concrete for the piles;
b. 2,640 tonnes rock armour;
c. 982 m^2 grey-green bank protection (e.g. a geotextile turf type solution);
d. 4,375 tonnes aggregate;
e. 2,625 tonnes imported earthworks, based on the cut and fill deficit;
f. 765 m^3 temporary construction materials in the form of river training / retaining walls (assumed to be Legato blocks made of pre-cast high strength concrete, equating to approximately 1,636 tonnes concrete); and
g. 324 tonnes temporary gabion mattress underlying the temporary river training works.

13.10.2. For the purposes of the GHG emissions calculations for the temporary construction materials (river training / retaining walls and gabion mattress), it was assumed that these

were reused offsite. However, if they were sent to landfill this would slightly increase the GHG emissions, but not change the overall findings of the assessment.

13.10.3. Using the Highways England Carbon Tool10, the above data indicates that the Stabilisation Works would increase the construction phase GHG emissions by 1.0 thousand tonnes of carbon dioxide equivalent (ktCO2e).

13.10.4. The additional construction phase GHG emissions are not of a value to materially affect the findings reported in **Section 14.10, Chapter 14: Climate Part A** of the [**APP-058**], or for the Scheme as reported in **Table 16-8, Chapter 16 Assessment of Cumulative Effects** of the ES [**APP-062**].

13.10.5. **Table 13-1** presents the revised Scheme GHG emissions, taking into account the Stabilisation Works as well as the construction of the revised Scheme, operational replacement, land use change and operational end-user traffic for the Scheme.

Table 13-1 - Combined Scheme Impacts on Carbon Budgets

Stage / timing	Total GHG emissions (thousand tonnes of carbon dioxide equivalent; $kTCO_2e$)
Combined construction phase (2021/23)	60
Operation phase (2023-2082)	2,428
Total for lifecycle (2021-2082)	2,488
Total during third Carbon Budget period* (2018-2022) [% of budget]	40 [0.00158%]
Total during fourth Carbon Budget 4 period (2023-2027) [% of budget]	161 [0.00826%]
Total during fifth Carbon Budget period (2028-2032) [% of budget]	185 [0.01074%]

[10] Highways England (2020) Carbon emissions calculations tool (version 2.3): Highways England.

Stage / timing	Total GHG emissions (thousand tonnes of carbon dioxide equivalent; $kTCO_2e$)
Comparison of 1 Year Operational Scheme GHG Emissions against North East Total Road CO_2e Emissions for 2016[11]	
One year's emission's during the operational phase as a % of North East Total Road CO_2e emission estimate in 2016	0.93%

13.10.6. Based on the assessment methodology set out in **Section 14.4, Chapter 14: Climate Part A** of the ES [APP-058], it is anticipated there would be a Slight Adverse effect for GHG during construction of the revised Scheme, with the inclusion of the Stabilisation Works, when considering the mitigation measures.

13.10.7. Institute of Environmental Management and Assessment guidance12 suggests that all GHG emissions are significant in the absence of any significance criteria or defined threshold. However, given the mitigation measures for the revised Scheme, the magnitude of GHG emissions and the context of the Scheme, using professional judgement, it is considered that the Slight Adverse effect of the Scheme is Not Significant. Furthermore, the GHG impacts of the revised Scheme (including the Stabilisation Works) would not have a material impact on the Government meeting its carbon reduction targets.

13.11 MONITORING

13.11.1. The monitoring requirements for Climate have not changed due to the Stabilisation Works. Therefore, the text within **Section 14.11, Chapter 14: Climate Part A** of the ES [**APP-058**] remains unchanged and valid.

13.12 UPDATED DMRB GUIDANCE

13.12.1. Since the assessments in the ES were completed, the DMRB methodology was superseded and replaced with updated guidance as detailed in **Section 14.4, Chapter 14: Climate Part A** of the ES [**APP-058**]. A DMRB sensitivity test for likely significant effects has been undertaken and it concluded that it would not change the likely significance of effects. This is because the approach used for the assessment has recently evolved and been brought in

[11] Department for Business, Energy & Industrial Strategy (2018), 2005 to 2016 UK Local and regional CO2 emissions – data table. Available at: https://www.gov.uk/government/statistics/uk-local-authority-and-regional-carbon-dioxide-emissions-national-statistics-2005-2016

[12] IEMA (2017) EIA Guide to Assessing Greenhouse Gas Emissions and Evaluating their Significance, 2017

close alignment with the updated guidance (DMRB LA11413) and therefore, considered to be of the same standard.

[13] Highways England (2019) Design Manual for Roads and Bridges (DMRB) LA 114 Climate. Available at: https://www.standardsforhighways.co.uk/dmrb/search?discipline=SUSTAINABILITY_AND_ENVIRONMENT

14 ASSESSMENT OF CUMULATIVE EFFECTS

14.1 INTRODUCTION

14.1.1. **Chapter 16: Assessment of Cumulative Effects** of the ES [**APP-062**] considers the likely significant cumulative effects of the revised Scheme. This comprises within topic combined effects (impacts acting on the same common sensitive receptor within an individual environmental topic), cross topic combined effects (impacts from different environmental topics that combine to cause multiple effects on a single common sensitive receptor) and cumulative effects (impacts of the revised Scheme interacting with impacts from other proposed developments in the vicinity of a receptor).

14.1.2. Although the Stabilisation Works would lead to new significant effects, it is anticipated that due to the distance between the Stabilisation Works and lack of developments that have the potential to impact on the River Coquet, there would be no cumulative impacts above that reported in **Chapter 16: Assessment of Cumulative Effects** of the ES [**APP-063**]. The developments considered in this Addendum include the 43 developments identified in the cumulative short list as detailed in **Chapter 16: Assessment of Cumulative Effects** of the ES [**APP-063**] as well as an additional seven developments identified as part of an updated search for relevant planning applications undertaken on 4 January 2021 (see **Table 14-1**).

Table 14-1 - Additional Developments

Planning Application Reference	Development Description	Approximate Distance from Scheme or Affected Road Network
20/02884/CCMEIA	Industrial development - Land north of Shiel Dykes, U3050 Swarland Junction to Stouphill Junction, Swarland	6.4 km north of Part A Order Limits; adjacent to ARN
20/01883/FUL	Industrial development - Site north of Highway England depot known as Hotspur Forestry Sawmill, Larch Drive, Lionheart Enterprise Park, Alnwick	Within Part B Order Limits at Lionheart Enterprise Compound
20/02093/FUL	Recreational development - Burgham Park Golf Club, Burgham Park, Felton	150 m west of Part A Order Limits
20/02094/FUL	Residential development - Land north west of Burgham Park Golf Club, Burgham Park, Felton	685 m west of Part A Order Limits
20/01917/FUL	Commercial development - Land north of Middlemoor	1 km west from Part B Order Limits; adjacent to ARN

Planning Application Reference	Development Description	Approximate Distance from Scheme or Affected Road Network
	Windfarm Control Building, Chathill	
20/01601/FUL	Residential development - Land south of King Edward High School, Cottingwood Lane, Morpeth	2 km south east of Part A Order Limits; 150 m west of ARN
20/02482/FUL	Residential development - Land north of Fairfields, Longframlington	4.6 km west of Part A Order Limits; adjacent to ARN

14.1.3. This chapter of the ES Addendum therefore only considers the likely significant cross topic (Biodiversity and Road Drainage and the Water Environment) combined effects of the Stabilisation Works (described in **Chapter 2: Stabilisation Works** of this Addendum).

14.2 COMPETENT EXPERT EVIDENCE

14.2.1. The competent expert advice for the Assessment of Cumulative Effects assessment has not changed for this assessment. Therefore, the text within **Section 16.2, Chapter 16: Assessment of Cumulative Effects** of the ES [**APP-056**] remains unchanged and valid

14.3 LEGISLATIVE AND POLICY FRAMEWORK

14.3.1. The legislative and policy framework for the Assessment of Cumulative Effects has not changed since the publication of the ES. Therefore, the text within **Chapter 16: Assessment of Cumulative Effects** of the ES [**APP-062**] remains valid.

14.4 ASSESSMENT METHODOLOGY

14.4.1. In order to ensure a comparable assessment with the ES, the assessment methodology followed for the Assessment of Cumulative Effects has not changed in response to the Stabilisation Works. Therefore, the text within **Chapter 16: Assessment of Cumulative Effects** of the ES [**APP-062**] remains unchanged and valid.

14.4.2. As both Biodiversity and Road Drainage and the Water Environment topics in this ES Addendum have reported new significant effects on the River Coquet (see **Chapter 7: Biodiversity** and **Chapter 8: Road Drainage and the Water Environment** of this ES Addendum), the Assessment of Cumulative Effects reported here considers the likely significant cross topic combined effects on this common sensitive receptor.

14.5 ASSESSMENT ASSUMPTIONS AND LIMITATIONS

14.5.1. The assessment assumptions and limitations for the Assessment of Cumulative Effects for the construction Stabilisation Works have not changed from the ES. Therefore, the text within **Chapter 16: Assessment of Cumulative Effects** of the ES [**APP-062**] remains unchanged and valid.

14.6 STUDY AREA

14.6.1. The Study Area for the Assessment of Cumulative Effects has not changed for the Stabilisation Works. Therefore, the text within **Section 16.6 of Chapter 16: Assessment of Cumulative Effects** of the ES [**APP-062**] remains unchanged and valid.

14.7 BASELINE CONDITIONS

14.7.1. The receptor under consideration in this assessment is the River Coquet, the particular features of which are described in **Sections 7.7 and 8.7** of this ES Addendum and the respective sections of the ES (**Section 9.7** of **Chapter 9: Biodiversity Part A** of the ES [**APP-048**] and **Section 10.7** of **Chapter 10: Road Drainage and the Water Environment Part A** of the ES [**APP-050**]).

14.7.2. There are no other changes to the baseline for the Assessment of Cumulative Effects; the text within **Section 16.7 of Chapter 16: Assessment of Cumulative Effects** of the ES [**APP-062**] remains valid.

14.8 ASSESSMENT OF CROSS TOPIC COMBINED EFFECTS

CONSTRUCTION

14.8.1. The interaction of the combined Biodiversity and Road Drainage and the Water Environment effects on the River Coquet are detailed in **Table 13-1.**

Table 14-2 – Assessment of Combined Effects

Common Sensitive Receptor	Impacts	Combined Effect
Construction		
River Coquet: – SSSI and HPI designations – Riverbank and in-river habitats – Water quality (chemical and ecological quality) – Channel morphology	– Permanent loss and temporary damage of riverbank habitat and bed / bank features – Permanent damage or degradation of watercourse due to changes in water chemistry – Temporary damage of in-river habitat – Degradation of bank and bed features – Short term increase in turbidity – Alteration to channel dynamics. – Restriction of flow and reduced channel width, potentially resulting in increased sediment transport adjacent to the river training works	– Mitigation measures are set out within **Sections 7.9** and **8.9** of this ES Addendum. – As detailed in **Section 7.10** of this ES Addendum, the permanent loss of riverbank habitat of the SSSI / HPI as a result of the proposed amendment would result in a direct, permanent **Moderate Adverse** residual effect. – As detailed in **Section 8.10** of this ES Addendum, the proposed works would have a **Slight Adverse** residual effect on the River Coquet from sediment regime, channel morphology and natural fluvial processes. – When considering both the Biodiversity and Road Drainage and the Water Environment effects on the River Coquet, the works would have a combined residual effect of **Moderate Adverse** during construction.

14.8.2. All other impacts during construction and operation, detailed within **Section 16.8 of Chapter 16: Assessment of Cumulative Effects** of the ES [**APP-062**], remain unchanged and valid.

14.9 MITIGATION AND MONITORING

14.9.1. No further mitigation or monitoring measures are proposed, hence the details within **Section 16.10 of Chapter 16: Assessment of Cumulative Effects** of the ES [**APP-062**], remain unchanged and valid.

14.10 UPDATED DMRB GUIDANCE

14.10.1. Since the assessments in the ES were completed, the DMRB methodology was superseded and replaced with updated guidance as detailed in **Chapter 16: Assessment of Cumulative Effects, Section 16.4** of the ES [**APP-062**]. A DMRB sensitivity test for likely significant effects has been undertaken, detailed in **Appendix 4.5: DMRB Sensitivity Test** of the ES [**APP-197**]. The findings of this sensitivity test, that the assessment complies with the changes in the updated guidance (LA 10414) and the conclusions would not change, remain valid for the assessment reported in this ES Addendum.

[14] Highways England (2020) Design Manual for Roads and Bridges (DMRB) LA 104 Environmental assessment and monitoring.

15 SUMMARY

15.1 INTRODUCTION

15.1.1. **Chapter 17: Summary** of the ES [**APP-063**] describes the likely significant effects of Part A.

15.1.2. A summary of the likely significant effects as a result of the Stabilisation Works is presented below. All other conclusions within **Chapter 17: Summary** of the ES [**APP-063**] remain valid.

15.2 SUMMARY OF LIKELY SIGNIFICANT EFFECTS

BIODIVERSITY

Construction

15.2.1. Significant effect (direct, permanent, Moderate Adverse) due to the loss of riverbank habitat in the River Coquet and Coquet Valley SSSI as a result of the proposed hard engineered scour protection to the north banks of the river.

CUMULATIVE EFFECTS

15.2.2. Significant combined residual effect (Moderate Adverse) during construction as a result of both the biodiversity and road drainage and the water environment effects on the River Coquet.

15.3 CONCLUSION

15.3.1. The assessments presented in this ES addendum have concluded that although the environmental impacts of the Stabilisation Works vary between topics, overall this change to the Scheme would not alter the findings of the ES with comparable effects to those assessed previously, with the exception of Biodiversity and cross-topic combined effects as detailed above.

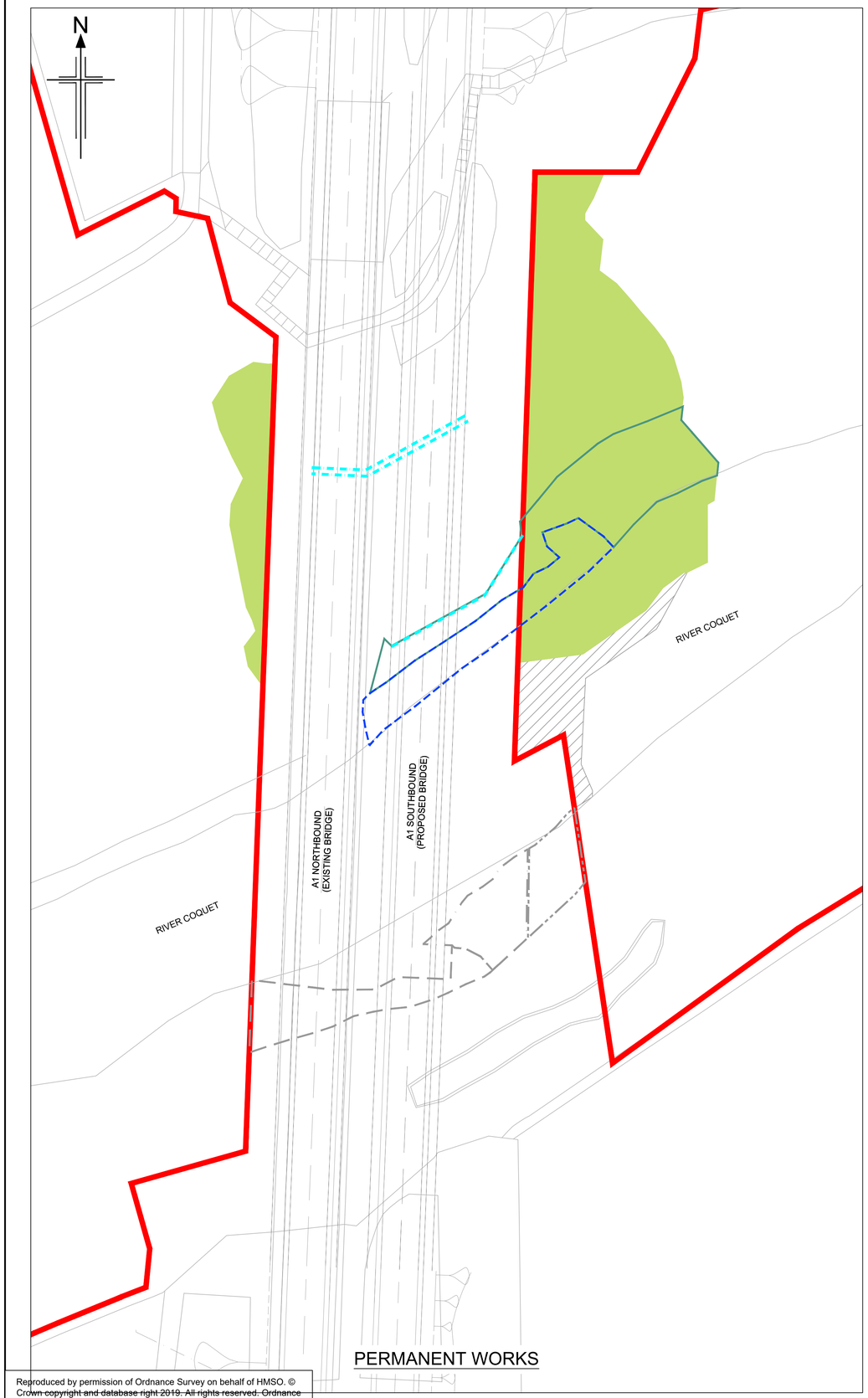
16 ABBREVIATIONS

Acronym	Definition
CA	Conservation Area
CEnv	Chartered Environmentalist
CEMP	Construction Environmental Management Plan
CiFA	Chartered Institute for Archaeologists
CMRA	Coal Mining Risk Assessment
CMLI	Chartered Member for Landscape Institute
DCO	Development Consent Order
DMRB	Design Manual for Roads and Bridges
ECML	East Coast Main Line
EIA	Environmental Impact Assessment
ES	Environmental Statement
ExA	Examining Authority
HER	Historic Environment Records
HGV	Heavy Goods Vehicle
HPI	Habitats of Principle Importance
IEMA	Institute of Environmental Management and Assessment
LBAP	Local Biodiversity Action Plan
LWS	Local Wildlife Site
LVIA	Landscape Visual Impact Assessment
NERC	Natural Environment and Rural Committees
NTS	Non-Technical Summary
OS	Ordinance Survey
PEA	Preliminary Ecological Appraisal

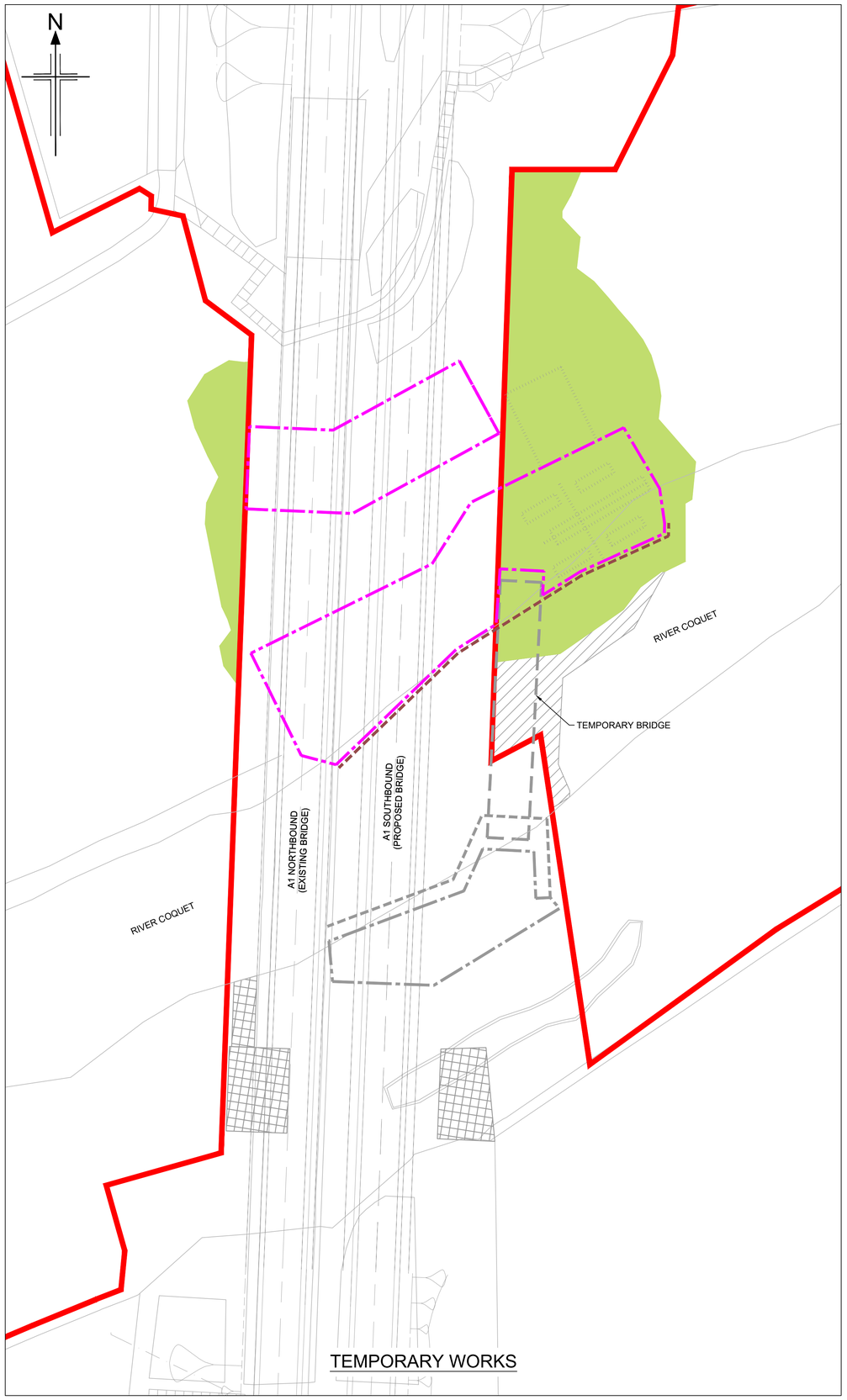
Acronym	Definition
SNCI	Site of Nature Conservation Importance
WSI	Written Scheme of Investigation
ZTV	Zone of Theoretical Visibility

Appendix A

FIGURES



PERMANENT WORKS



TEMPORARY WORKS

KEY:

FIGURE 1

Existing Order limits

Area assessed under Environmental Statement Addendum: Stabilisation Works for Change Request

Proposed extension to Order limits - north bank stabilisation

Permanent:

Indicative scour protection
- rock armour
- grey-green bank protection

Stabilisation piling location

Temporary:

Temporary river training work to protect piling platform

Piling platform

Additional area assessed under Environmental Statement Addendum: Southern Access Works for Change Request (See Figure 1 for details)

Proposed extension to Order limits - south bank access

Permanent:

Indicative scour protection
- reno mattress
- rock armour
- grey-green bank protection

Temporary:

Indicative areas of potential avoidance of site clearance

Temporary river training work to protect piling platform

Piling platform

Temporary bridge

Construction crane

0 10 20 30 40 50

SCALE 1:500 METRES

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
P01	08/03/21	FIRST ISSUE	RM	GC	GC	SK

Contractor: COSTAIN

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Client: highways england

Project: REGIONAL DELIVERY PARTNERSHIP
A1 MORPETH TO ELLINGHAM
DUALLING

Drawing title: FIGURE 1 ENVIRONMENTAL STATEMENT ADDENDUM STABILISATION WORKS FOR CHANGE REQUEST

Drawing status: S2 - SUITABLE FOR INFORMATION

State Code	Preliminary	Sheet Size	
Project Stage	PCF Stage 5		
Scale	1:500@N/A	DO NOT SCALE	
Jacobs No.	B3660114	Rev	P01
Client no.	HE551459		

Drawing number
PIN | Originator | Volume
HE551459 - JAC - ELS -
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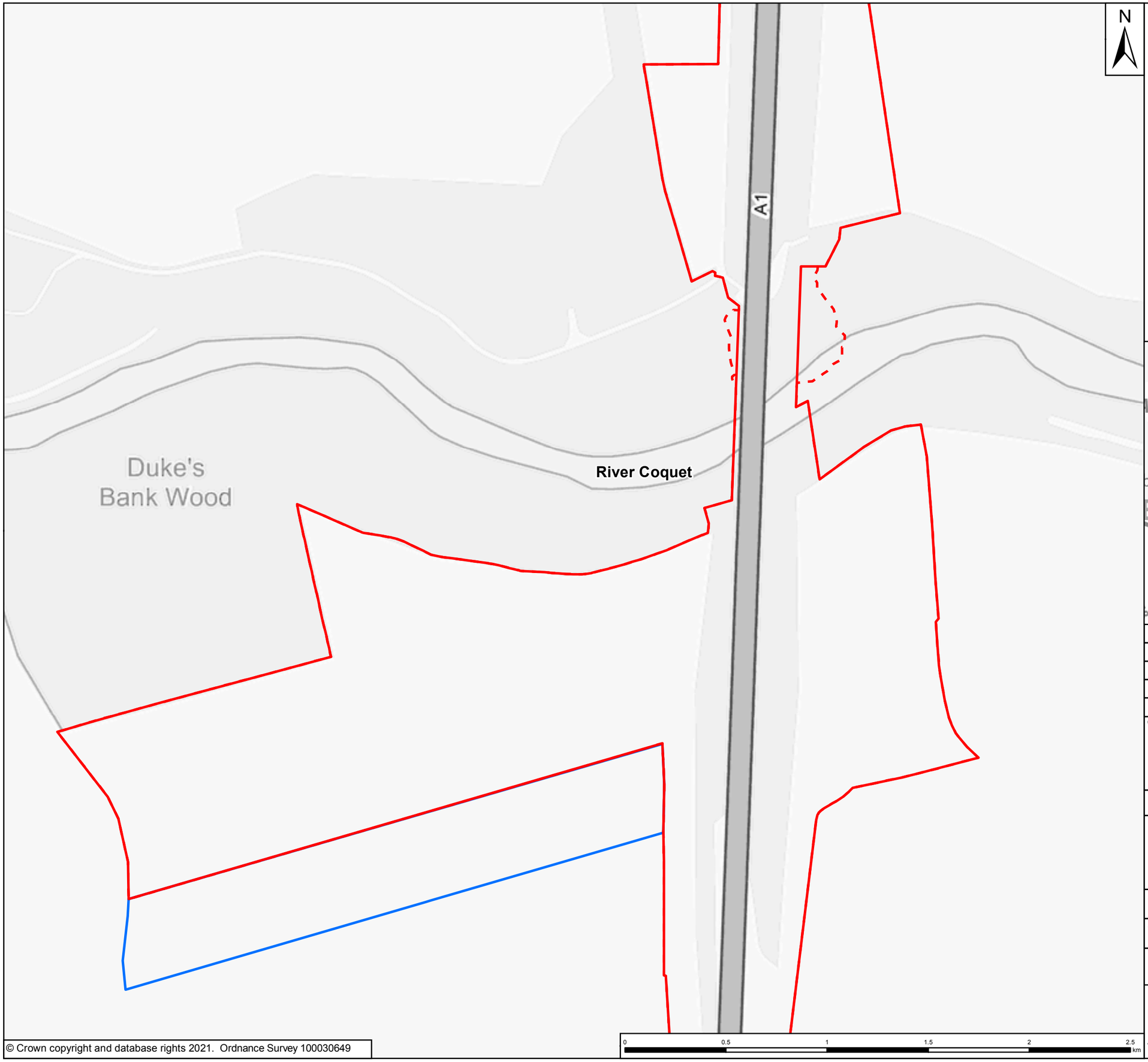
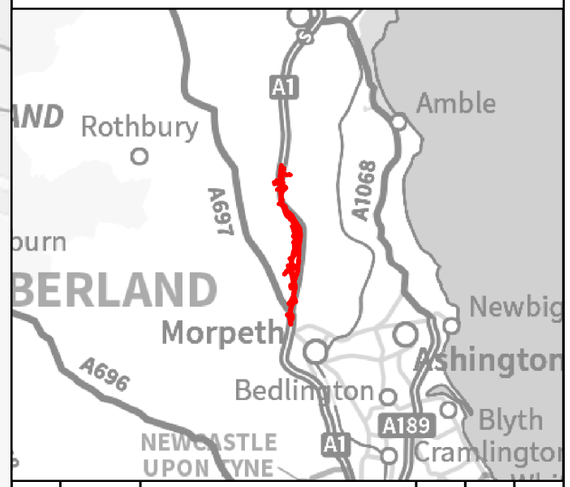


Key

- Existing Order Limits
- Extended Order Limits
- Indicative Compensatory Habitat Location



Rev	Date	Description	By	Chk'd	App'd
P01	07/01/2021	First Issue	RM	LM	KS

Client: highways england

Project Title: A1 in Northumberland: Morpeth to Ellingham

Drawing Title: Figure 2: Location Plan and Indicative Compensatory Habitat Location

Scale	Drawn	Checked	Approved	Authorised
1:3,000	RM	LM	KS	DM
Original Size	**Date**	**Date**	**Date**	**Date**
A3	07/01/2021	07/01/2021	07/01/2021	07/01/2021

Drawing Status: For Information

Suitability: S1

Drawing Number: Project HE551459 | Originator WSP | Volume | A2E Location | RP Type | LE Role | 2130 Number

Project Ref. No.: 70044137

Revision: P01

Date Saved: 22/01/2021 10:20:39 User Name: UKRJM017

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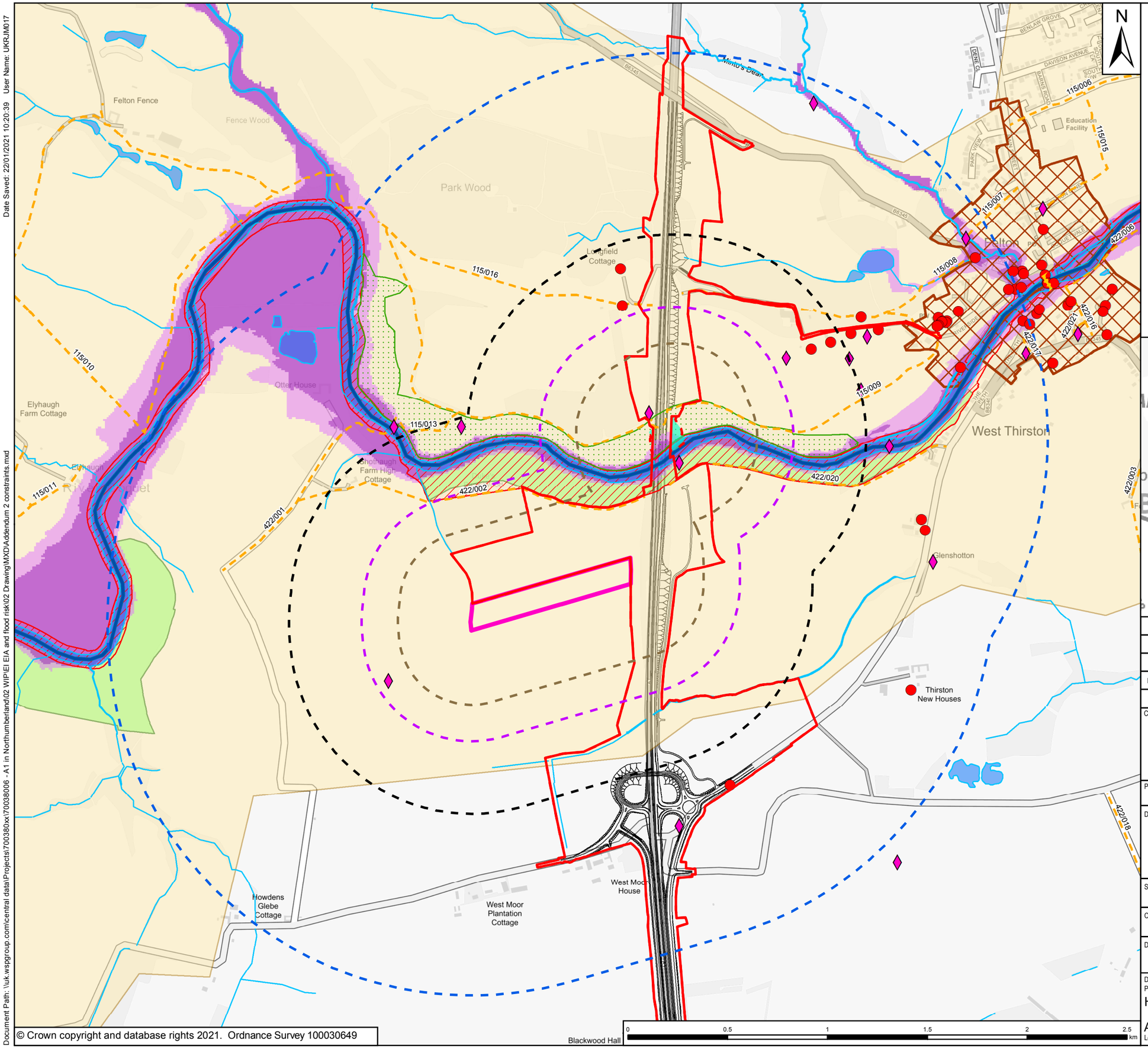
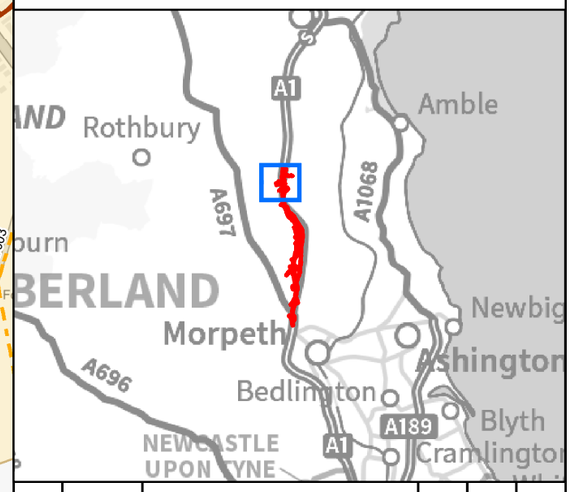


Key

- Existing Order Limits
- Extended Order Limits
- 200 m Buffer
- 300 m Buffer
- 500 m Buffer
- 1 km Buffer
- General Arrangement
- Additional Land Take
- Indicative Compensatory Habitat Location
- ScheduledMonuments
- Listed Building
- Non-Designated Heritage Assets
- Public Rights of Way
- Statutory Main Rivers
- Surface Watercourses
- Conservation Area
- Local Wildlife Sites
- Site of Special Scientific Interest
- Surface Water Bodies
- Flood Zone 3
- Flood Zone 2
- Ancient Woodland Inventory
- Area of High Landscape Value



Rev	Date	Description	By	Chk'd	App'd
P01	07/01/2021	First Issue	RM	LM	KS

Client: highways england

Project Title: A1 in Northumberland: Morpeth to Ellingham

Drawing Title: Figure 3: Environmental Constraints

Scale	Drawn	Checked	Approved	Authorised
1:10,000	RM	LM	KS	DM
Original Size	**Date**	**Date**	**Date**	**Date**
A3	07/01/2021	07/01/2021	07/01/2021	07/01/2021

Drawing Status: For Information

Suitability: S1

Drawing Number: Project HE551459 | Originator WSP | Volume

A2E Location | RP Type | LE Role | 2130 Number

Project Ref. No.: 70044137

Revision: P01

Appendix B

SUMMARY OF PROPOSED CHANGES TO APPLICATION

A1 in Northumberland: Morpeth to Ellingham

Scheme Number: TR010059

Summary of Proposed Changes to Application

Planning Act 2008

The Infrastructure Planning (Examination Procedure Rules) 2010

Infrastructure Planning (Examination Procedure) Rules 2010

Planning Act 2008

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

December 2020

Infrastructure Planning

Planning Act 2008

The Infrastructure Planning (Examination Procedure Rules) 2010

The A1 in Northumberland: Morpeth to Ellingham

Development Consent Order 20[xx]

Summary of Proposed Changes to Application

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1 INTRODUCTION

1.1 Purpose of this document

1.1.1 This document describes a forthcoming request to amend the application for development consent (the "Application") under the Planning Act 2008 (the "2008 Act") submitted to the Secretary of State for Transport via Planning Inspectorate (the "Inspectorate") on 7 July 2020 by Highways England (the "Applicant") for the A1 in Northumberland: Morpeth to Ellingham (the "Scheme"). Its intention is to make the Examining Authority (ExA) and other participants in the examination aware of proposals for changes to the Application.

1.1.2 The Scheme comprises two sections known as Part A: Morpeth to Felton (Part A) and Part B: Alnwick to Ellingham (Part B).

1.1.3 On 4 August 2020, it was confirmed on behalf of the Secretary of State that the application had been accepted for examination. The ExA was appointed on 19 November 2020. This document has been produced in response to the ExA's Rule 6 Letter – Notification of the Preliminary Meeting and matters to be discussed, which was published 19 November 2020 and in which the ExA makes written submissions on the examination procedure by 10 December 2020 (Deadline A) , which is in advance of the first Preliminary Meeting to be held on 15 December 2020.

1.1.4 As is normal in relation to any engineering project, further design development of the Scheme has continued to be undertaken by the Applicant since the application for the Development Consent Order (DCO) was made in order to release efficiencies and design benefits. This is particularly important in optimizing a scheme being delivered by the public sector in the public interest. Consequently, the Applicant wishes to include certain refinements to the application accordingly and this document sets out those amendments to accommodate them and with the leave of the ExA, the proposed procedure for doing so.

1.1.5 The proposed changes to the Scheme are detailed further in this document and comprise the following:

1. Changes to temporary and permanent earthworks within the Order limits along both Part A (between Morpeth and Felton) and Part B (between Alnwick and Ellingham) in order to reduce earthwork movement. These changes are an extension to Parameters 4 and 5 for Part A, as set out in **Chapter 2: The Scheme** of the Environmental Statement (ES) [APP-037]. There would also be additional temporary and permanent earthworks. These changes to the earthworks strategy would not involve additional land and, as explained in **Section 2.1** of this document, it is not considered that there would be any new or changed environmental impacts as a result.
2. Works on the north bank of the River Coquet in order to stabilise the proposed bridge and existing bridge within Part A. The stabilisation works would include the installation of piles in the north bank of the River Coquet and the installation of erosion protection measures on the river bank. Land outside the Order limits would temporarily be required as a working area for the installation of the piles and access to works, as well as for the carrying out of the erosion protection

measures. As the installation works would lead to the loss of woodland within the Coquet River Felton Park Local Wildlife Site (LWS), there may also be a requirement for additional compensatory habitat outside the Order limits. Permanent erosion protection measures are proposed on the north bank (including outside the existing Order limits) and on the south bank.

3. Provision of a temporary access to the south bank of the River Coquet is proposed by crossing the river from the temporary works on the northern bank. It is anticipated that this would result in improved environmental performance in terms of access that would otherwise be provided from the South bank itself. The engineering solution for such a crossing is to use of a temporary bridge to span over the river. It is anticipated that there would also be some temporary river training works along each riverbank and additional erosion protection to the southern pier of the new bridge. Additional temporary rights would be required for the installation of the temporary bridge.

1.1.6 The Applicant confirms that the Scheme is deliverable without the changes to the temporary and permanent earthworks as referred to in the first sub-paragraph in **paragraph 1.1.5** above. However, as explained in **paragraphs 2.2.1** and **2.2.2**, the ongoing ground investigations have identified slope instability on the north bank of the River Coquet Valley, which means a change in circumstances has occurred. Consequently, the additional slope stabilisation referred to in the second sub-paragraph of **paragraph 1.1.5** is now necessary, but could not have been identified when the Application was made. The south bank access detailed in the third sub-paragraph of **paragraph 1.1.5** is enabled by these works.

1.1.7 An indicative timetable for progressing the amendments to the application through the DCO process is provided in **Section 3** of this document.

2 PROPOSED CHANGES TO THE SCHEME

2.1 Changes to temporary and permanent earthworks

2.1.1 The Applicant proposes to maximise the re-use of materials (via excavation, deposition and temporary storage), within the existing Scheme extents. A recent review of the earthworks strategy has identified an opportunity to reduce earthwork movement and as a result greater flexibility in temporary and permanent storage of Site won material is required to achieve this. The indicative earthworks areas are shown in the figure in the **Indicative Earthwork Change Locations** figure in **Appendix A**.

2.1.2 To balance materials across both Parts A and B, the following methods are proposed:

- **a.** Utilising borrow pits to exchange and win additional material suitable for construction.
- **b.** Maximising use of soil bunds already specified within the **Figure 7.8: Landscape Mitigation Masterplan** for Part A [APP-095], **Figure 7.10 Landscape Mitigation Masterplan** for Part B [APP-144] and **Figure 7.14: Landscape Mitigation Masterplan including Assessment Parameter 3** for Part B [APP-148], for disposal of excess site material, in Part A.
- **c.** Maximising of fill within slopes, already specified within **Figure 7.8**: **Landscape Mitigation Masterplan** for Part A [APP-095] and **Figure 7.10 Landscape Mitigation Masterplan** for Part B [APP-144] and **Figure 7.14: Landscape Mitigation Masterplan including Assessment Parameter 3** for Part B [APP-148], for re-use of site material, in Part A.
- **d.** Creation of new soil bunds within Part B to maximise re-use of excess site material.
- **e.** Maximising of slopes for re-use of excess site material, in Part B.
- **f.** Laying down additional material increasing some localised ground levels.
- **g.** Raising levels of junction “bowls” (level or rounded rather than dished).
- **h.** Creating new, temporary soil storage areas within both Part A and Part B.

2.1.3 These changes are an alteration to Parameters 4 and 5 for Part A, as set out in **Chapter 2: The Scheme** of the ES [APP-037]. There would also be additional temporary and permanent earthworks that require assessment for Part A and Part B. Therefore, it is appropriate to ensure that the environmental information before the Examination addresses the prospect of altered impacts This is addressed by sensitivity testing as described at **paragraph 2.1.6** below.

2.1.4 Mitigation measures such as detention basins, grassed areas, trees, shrubs and hedgerow planting would remain the same as originally proposed in **Figure 7.8 Landscape Mitigation Masterplan** for Part A [APP-095]and **Figure 7.10 Landscape Mitigation Masterplan** for Part B [APP-144]. The earthworks would be designed to accommodate these measures and takes into consideration the diverted 66 kV Extra High Voltage cable (Work Number: 24) as shown on **Figure 7.14: Landscape Mitigation Masterplan including Assessment Parameter 3** for Part B [APP-148].

2.1.5 The benefits for this proposed change for both Part A and Part B would be to:

- **a.** Greater flexibility during construction to reduce road haul and offsite disposal,

therefore reducing vehicle emissions including greenhouse gas.

b. Greater flexibility during construction to reduce the importation of material, therefore reducing vehicle emissions including greenhouse gas.

c. By keeping the majority of material transportation within the Site, vehicle movements between Part A and Part B and for disposal, would be minimised, reducing construction traffic.

d. Where constructed, the addition of new bunds would provide positive impacts in integrating the earthworks into the landscape and immediate landform.

e. Where constructed, the addition of new bunds would facilitate screening for sensitive receptors near the A1, especially during initial woodland establishment, softening the appearance.

f. The increase in height of soil bunds already proposed would facilitate better screening of the A1, especially during the woodland establishment, softening the appearance.

g. Uplift / slackening of slopes to areas would provide positive impacts in integrating the earthworks into the landscape and immediate landform.

h. Infilling of junction “bowls” would achieve better integration with the existing landform.

2.1.6 A sensitivity assessment of the environmental impact of the changes to the temporary and permanent earthworks in the powers contained within the draft DCO [APP-014] is being undertaken to enable the consequences in terms of the environmental impacts already assessed. The assessment will consider whether the changes to the temporary and permanent earthworks would alter the conclusions of the environmental impact assessment already undertaken. This will be concluded by and reported at Deadline 4 (12 March 2021).

2.1.7 The scope of this sensitivity assessment and anticipated outcomes is shown in **Table 1** below, which represent preliminary indications subject to completion of the assessment.

Table 1 - Changes to the temporary and permanent earthworks desktop sensitivity test

Aspect of Assessment	Construction / Operation	Likely Change to Significant Effects Y/N	Further Assessment likely required to Confirm Significance Y/N
Air Quality			
Dust and particulate matter from changes to the earthworks	Construction	N	Y
Emissions from construction traffic	Construction	N	N
Emissions from operational traffic	Operation	N	N
Noise and Vibration			

Aspect of Assessment	Construction / Operation	Likely Change to Significant Effects Y/N	Further Assessment likely required to Confirm Significance Y/N
Noise generated from construction activities	Construction	N	Y
Vibration generated from construction activities	Construction	N	Y
Noise from construction traffic	Construction	N	N
Noise from operational traffic	Operation	N	N
Changes to noise barrier effectiveness	Operation	N	Y
Landscape and Visual			
Changes to landscape character	Construction and operation	N	N
Changes to visual amenity	Construction and operation	N	Y
Cultural Heritage			
Changes to the setting of heritage assets	Construction and operation	N	Y
Disruption and disturbance to below ground archaeological remains	Construction	N	Y
Changes to historic landscapes	Construction and operation	N	N
Biodiversity			
Impacts on Statutory and non-statutory sites	Construction and operation	N	N
Changes to habitats	Construction and operation	N	N
Impacts on protected and notable species	Construction and operation	N	N

Aspect of Assessment	Construction / Operation	Likely Change to Significant Effects Y/N	Further Assessment likely required to Confirm Significance Y/N
Changes to Biodiversity No Net Loss Assessment	Construction and operation	N/A	N
Changes to groundwater dependant terrestrial ecosystems	Construction and operation	N	N
Road Drainage and the Water Environment			
Changes to local hydrogeology in the vicinity of the borrow pits (including groundwater lowering and flooding)	Construction and operation	N	Y
Impact of groundwater to the functionality of the borrow pits (including dewatering)	Construction and operation	N	Y
Changes to flood risk	Construction and operation	N	Y
Changes to water quality	Construction and operation	N	N
Geology and Soils			
Changes to temporary land take	Construction	N	N
Changes to permanent land take	Operation	N	N
Material suitability for re-use	Construction	N	N
Mineral Safeguarding Areas	Construction	N	Y
Pollution to controlled water bodies	Construction	N	N
Foot and mouth burial site	Construction	N	Y
Population and Human Health			
Changes to temporary land take	Construction	N	N

Aspect of Assessment	Construction / Operation	Likely Change to Significant Effects Y/N	Further Assessment likely required to Confirm Significance Y/N
Changes to permanent land take	Operation	N	N
Changes to recreational journey amenity	Construction and operation	N	N
Changes to direct, indirect and induced job generation	Construction	N	N
Changes to human health determinants	Construction and operation	N	N
Material Resources			
Consumption of materials	Construction	N	Y
Generation and disposal of waste to landfill	Construction	N	Y
Consumption of materials	Operation	N	N
Generation and disposal of waste to landfill	Operation	N	N
Climate			
Effect of the Scheme on climate (Carbon / GHG) due to consumption of materials and transportation of materials	Construction	N	N
Effect of the operation of the Scheme on climate (Carbon / GHG) due to end-user traffic and maintenance, repair and refurbishment.	Operation	N	N
Vulnerability of the Scheme to climate change	Construction and operation	N	N
Combined and Cumulative Assessment			
Assessment of Within Topic combined effects	Construction and Operation	N	N

Aspect of Assessment	Construction / Operation	Likely Change to Significant Effects Y/N	Further Assessment likely required to Confirm Significance Y/N
Assessment of Cross Topic combined effects	Construction and Operation	N	N
Assessment of cumulative effects	Construction and Operation	N	N

2.1.1 A justification for the aspects of the assessments that would not require further assessments is provided below. The aspects of the assessments not discussed below have been scoped into the sensitivity assessment as shown in **Table 1**. However, where all aspects of the assessments have been scoped into the sensitivity assessment this is stated in the section below for completeness.

Air Quality

Construction Traffic

2.1.2 The changes to the earthworks strategy would reduce the number of construction traffic movements, meaning emissions from construction traffic would be less than that reported in **Chapter 5: Air Quality** Park A of the ES [APP-040] and **Chapter 5: Air Quality** Part B of the ES [APP-041] of the Environmental Statement (ES). As emissions from construction traffic has been reported as not significant in the ES, would remain the same with the changes to the temporary and permanent earthworks.

Operational Traffic

2.1.3 The Scheme alignment and traffic data would remain the same with the changes to the earthworks meaning there would be no change to the operational air quality assessment presented in **Chapter 5: Air Quality** Part A [APP-040] and **Chapter 5: Air Quality** Part B [APP-041].

Noise and Vibration

Construction Traffic

2.1.4 Changes to the earthwork's strategy would reduce the number of construction traffic movements, meaning noise from construction traffic would be less than that reported in **Chapter 6: Noise and Vibration** Part A [APP-042] and **Chapter 6: Noise and Vibration** Part B [APP-043]. As noise from construction traffic has been reported as not significant in the ES, this would not change with the temporary and permanent earthworks.

Operational Traffic

2.1.5 Although additional permanent bunds are proposed, these are not likely to result in any further adverse operational stage effects. Therefore, further assessment work would not be undertaken for this element of the assessment.

Landscape and Visual

Construction and Operation - Landscape Character

2.1.6 The changes to the temporary and permanent earthworks would not change the assessment of significant effects on landscape character as presented in **Chapter 7: Landscape and Visual** Part A [APP-088] and **Chapter 7: Landscape and Visual** Part B [APP-089]. This is because the nature and form of the earthworks would support integration of the Scheme into the local landscape character.

Cultural Heritage

Construction and Operation - Historic Landscapes

2.1.7 Based on professional judgement, that the changes to the temporary and permanent earthworks would not change the assessment of significant effects for historic landscapes as presented in **Chapter 8: Cultural Heritage** Part A [APP-046] and **Chapter 8: Cultural Heritage** Part B [APP-047]. A change in the significance of effects is not predicted due to the nature and location of the additional temporary and permanent earthworks and low value of the historic landscapes.

Biodiversity

Construction and Operation

2.1.8 There would no changes to the habitats proposed in the **Figure 7.8: Landscape Mitigation Masterplan** for Part A [APP-095], **Figure 7.10: Landscape Mitigation Masterplan** for Part B [APP-144] and **Figure 7.14: Landscape Mitigation Masterplan including Assessment Parameter 3** for Part B [APP-148]. This means there would be no changes to the biodiversity assessment as set out in **Chapter 9: Biodiversity** Part A [APP-048] and **Chapter 9: Biodiversity** Part B [APP-049] including the Biodiversity No Net Loss Assessment provided at Appendix 9.20 for Part A [APP-246] and Appendix 9.11 for Part B[APP-309] of the ES.

2.1.9 Where mammal wildlife culverts are proposed the earthworks would be designed around the openings of the culverts to maintain the length shown in **Figure 7.8: Landscape Mitigation Masterplan** for Part A [APP-095].

Road Drainage and the Water Environment

Construction - Water Quality

2.1.10 The mitigation set out in **Chapter 10: Road Drainage and the Water Environment** Part A [APP-050] and **Chapter 10: Road Drainage and the Water Environment** Part B [APP-051] and **Outline Construction Environmental Management** Plan (Outline CEMP) [APP-346] for controlling sediment and pollutants in surface water runoff would be applicable for the changes to the temporary and permanent earthworks. With these measures in place, there would no change to the outcomes of the water quality assessment.

Operation - Water Quality

2.1.11 As the drainage design would not be altered, there would changes to the water quality assessment for the operation of the Scheme as presented in **Chapter 10: Road Drainage and the Water Environment** Part A [APP-050] and **Chapter 10:**

Road Drainage and the Water Environment Part B [APP-051].

Geology and Soils

Construction and Operation - Temporary and Permanent Land Take

2.1.12 There would be no change to the temporary and permanent land take and therefore the assessment presented in **Chapter 11: Geology and Soils** Part A [APP-052] and **Chapter 11: Geology and Soils** Part B [APP-053] would remain the same.

Construction - Material Re-use and Pollution to Controlled Water Bodies

2.1.13 The mitigation set out **Chapter 11: Geology and Soils** Part A [APP-052] and **Chapter 11: Geology and Soils** Part B [APP-053] and **Outline CEMP** [APP-346] for the re-use of materials and control of potential contaminants would be applicable for the changes to the temporary and permanent earthworks. With these measures in place, there would be no change to the outcomes of the assessment.

Population and Human Health

Construction and Operation - Temporary and Permanent Land Take

2.1.14 There would be no change to the temporary and permanent land take and therefore the assessment presented in **Chapter 12: Population and Health** Part A [APP-054] and **Chapter 12: Population and Human Health** Part B [APP-055] would remain the same.

Construction and Operation - Recreational Journey Amenity

2.1.15 There would be no significant changes to recreational journey amenity as presented in **Chapter 12: Population and Human Health** Part A [APP-054] and **Chapter 12: Population and Human Health** Part B [APP-055]. The assessment of recreational journey amenity has considered changes to amenity along the length of the Scheme for walkers, cyclists and horse-riders. There would be no material changes to journey recreational amenity based on the Design Manual for Bridges (DMRB) Volume 11, Section 3, Part 8: Pedestrians, Cyclists, Equestrians and Community Effects criteria for population and human health. The latest DMRB guidance (LA112 Population and Human Health) does not require recreational journey amenity to be assessed.

Construction - Direct, Indirect and Induced Job Generation

2.1.16 Based on professional judgement, there would be no change to the assessment of significance for economy and employment as presented in **Chapter 12: Population and Human Health** Part A [APP-054] and **Chapter 12: Population and Human Health** Part B [APP-055].

Construction and Operation - Human Health

2.1.17 As there would be no changes to the assessment of significance for air quality, noise and vibration as well as road drainage and the water environment, there would be no change to the assessment of significance for human health as reported in **Chapter 12: Population and Human Health** Part A [APP-054] and **Chapter 12: Population and Human Health** Part B [APP-055].

Materials Resources

Operation

2.1.18 The operational consumption of materials and generation of waste would be minimal based on professional judgement and assessments of similar schemes. Therefore, the operational materials and waste assessment would remain the same as reported in **Chapter 13: Material Resources** Part A [APP-056] and **Chapter 13: Material Resources** Part B [APP-057].

Climate

Construction – Greenhouse Gas Emissions

2.1.19 The changes to the temporary and permeant earthworks would reduce imported material or disposal to landfill which would reduce the adverse impacts of the Scheme on greenhouse gas emissions. However, there would not be a substantial enough change to alter the assessment of significance presented in **Chapter 14: Climate** Part A [APP-058] and **Chapter 14: Climate** Part B [APP-059]. Additionally, the assessment reported in **Chapter 14: Climate** Part A [APP-058] and **Chapter 14: Climate** Part B [APP-059] presents a worst-case scenario when compared to the proposed changes to the earthworks.

Operation - Greenhouse Gas Emissions

2.1.20 As there would be no change to the alignment of the Scheme and traffic data, there would be no change to the operational greenhouse gas assessment presented in **Chapter 14: Climate** Part A [APP-058] and **Chapter 14: Climate** Part B [APP-059].

Construction and Operation - Vulnerability of the Scheme to Climate Change

2.1.21 The mitigation set out in **Chapter 14: Climate** Part A [APP-058] and **Chapter 14: Climate** Part B [APP-059] and **Outline CEMP** [APP-346] for futureproofing the Scheme for climate change would be applicable for the changes to the temporary and permanent earthworks. With these measures in place, there would no change to the outcomes of the assessment.

Combined and Cumulative Assessment

Construction and Operation - Within Topic Combined Effects Assessment

2.1.22 The Within Topic combined effects assessment considers the effects of both Part A and Part B on the same common sensitive receptor in an individual environmental topic. As the further assessment work will assess the Scheme as a whole (i.e. Part A and Part B together), a Within Topic combined effects assessment is not required.

Construction and Operation - Cross Topic Combined Effects Assessment

2.1.23 As there would be no change to the assessment of significance for all environmental topics with the changes to the temporary and permanent earthworks, there would not be a change to the assessment of Cross Topic combined effect presented in **Chapter 16: Assessment of Cumulative Effects** [APP-062].

Construction and Operation - Cumulative Effects Assessment

2.1.24 As there would be no change to the assessment of significance for all

environmental topics with the changes to the temporary and permanent earthworks, there would not be a change to the cumulative effect's assessment presented in **Chapter 16: Assessment of Cumulative Effects** of the ES [APP-062].

Changes to the Application

2.1.25 The changes to the application documents would be set out in a report and documents would be updated, if required, as detailed in **Table 2**. However, the proposed changes to the earthworks would not involve an addition to the Order land and the sensitivity assessment indicates that the changes would not be likely to generate new or materially different environmental impacts. Taking into account the guidance in section 2 of Advice Note Sixteen, it is therefore not anticipated that the proposed changes to earthworks would constitute a material change to the Application.

Table 2 - Documents to be updated for changes to the temporary and permanent earthworks

Document	Proposed Update
The draft DCO [APP-014]	The tailpiece to Schedule 1 would be updated if required to reflect the proposed earthworks strategy. Schedule 8 would also be updated to reflect any necessary changes to the use of land of which temporary possession may be taken.
Statement of Reasons [APP-018]	The description of the use of the land would be updated.
Case for the Scheme [APP-344]	The Case for the Scheme would need to be updated if the sensitivity assessment predicted that there would be a change on compliance with policy.
Outline CEMP [APP-346]	This would need to be updated if there was a change in required mitigation as a result of the sensitivity assessment.
Figure 7.8: Landscape Mitigation Masterplan for Part A [APP-095]	This would need to be updated to reflect changes in the temporary and permanent earthworks.
Figure 7.10: Landscape Mitigation Masterplan for Part B [APP-144]	This would need to be updated to reflect changes in the temporary and permanent earthworks.
Figure 7.14: Landscape Mitigation Masterplan including Assessment Parameter 3 for Part B [APP-148]	This would need to be updated to reflect changes in the temporary and permanent earthworks.
Book of Reference [OD-002]	The description of temporary and permanent land take would need to be updated.
National Policy Statement for National Networks Accordance Table [APP-345]	The accordance table would need to be updated if the sensitivity assessment predicted that there would be a change on compliance with policy.

Document	Proposed Update
Lands Plans [APP-006]	This would need to be updated to reflect changes in the temporary and permanent earthworks
Works Plan [APP-007]	This would need to be updated to reflect changes in the temporary and permanent earthworks
General Arrangement [APP-008]	This would need to be updated to reflect changes in the temporary and permanent earthworks
Rights of Way and Access Plans [APP-009]	This would need to be updated to reflect changes in the temporary and permanent earthworks
Consultation Report [APP-0221]	The Consultation Report will be updated to include consultation undertaken on the change to the proposals.

Consultation

2.1.26 As detailed in Advice Note 16, an applicant who intends to make a request for a material change to a DCO application is expected to consult all those prescribed in the Planning Act 2008 under section 42(a) to (d) who would be affected by the proposed change (giving a minimum of 28 days). Even if a requested change is non material, paragraph 2.5 of Advice Note 15 advises that there may still be a need, in the interests of fairness, to carry out consultation. Applicants are recommended to consider whether consultation is required to enable affected persons to make representations on the changes to the application.

2.1.27 The proposed change to the earthworks would not require additional land. Based on the scoping exercise, the changes would not be likely to generate new or materially different environmental impacts. The Applicant therefore does not consider that these changes would constitute a material change to the Application. Nevertheless, affected landowners may have an opinion on the earthworks strategy and the Applicant therefore considers it appropriate to undertake consultation in order that they have the opportunity to make representations. As detailed in **paragraph 3.1.1**, consultation will therefore be undertaken with all persons prescribed under Section 42 of the 2008 Act will be undertaken between 29 January 2021 – 25 February 2021.

2.1.28 The consultation will also be consistent with the procedures under The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017.

2.2 Land Stabilisation North of the River Coquet – Part A

2.2.1 The DCO application was submitted on 7th July 2020. As is normal with an infrastructure project of this nature, further detailed ground investigation and design has been undertaken in parallel with the DCO application process. It was identified in December 2019 that supplementary ground investigation would be required to inform the detailed design work for the Scheme. This ground investigation was undertaken between January and May 2020 with the first draft report being issued on 17 July 2020 (i.e. after the application had been submitted). The results were reported and reviewed over the summer, with the latest report being issued on 2 December 2020.

2.2.2 The review of the available geological and geotechnical information, including the reporting of the ground investigation works undertaken earlier in 2020, has identified that the north slope of the River Coquet Valley is suffering from instability which, without treatment, could cause a failure in the slope during the construction and operation of the new bridge and could also have a detrimental impact on the existing bridge structure.

2.2.3 Whilst detailed design has not yet taken place, a number of options have been considered to address the instability and a number of piling configurations have been considered. The proposed solution is that it will comprise spaced bored piles, ensuring the stability of the northern valley sides and allowing the new pier foundation to be installed.

2.2.4 The proposal would comprise two rows of spaced piles to the north side of the proposed pier location and a third row to the south side as shown in the **Permanent Works at the River Coquet** figure in **Appendix A**. All of the permanent piling works are currently proposed to stay within the existing Order limits of Part A. However, carrying out the piling works within the existing Order limits of Part A would present engineering challenges. It is therefore necessary to expand the Order limits to provide temporary working areas in order to ensure that the proposed stabilisation construction works can be carried out.

2.2.5 The stabilisation works on the slope will include scour protection along the river's edge on the north bank of the River Coquet to provide erosion protection to the lower stabilisation piles to avoid further works during the design life of the structure, which is 120 years.

2.2.6 Should the erosion protection measures only be installed along the riverside within the current Order limits, it is highly likely that further significant engineering interventions and erosion protection measures would be required in the future in order to protect the new bridge foundations from undermining and slope instability. Therefore, in order to provide robust erosion protection and prevent a deterioration of the toe of the slope of the North bank of the River Coquet over time, it is proposed that rights are acquired for installation and retention of scour protection in additional land that extends beyond the current Order limits, the extent of this additional land is shown in the **Temporary Works at the River Coquet** in **Appendix A**.

2.2.7 As noted above, in order to install the piles and bank scour protection, additional temporary land is required for working areas as well as for construction access, including appropriate clearance to provide access to the piling works.

2.2.8 The land within the extended Order limits would be used for the provision of working platforms and access routes to and around the platforms for use by the plant and equipment required for the construction process. Given the nature of the required works, this could not be carried out within the existing Order limits. The extended limits will also support the movement of the equipment around the piles (once installed) to the rest of the works in the area in this challenging topography. The formation of the accesses and platforms will involve the localised grading of areas, as well as the cutting and filling of several benches within the existing slope.

2.2.9 Construction of the bank scour protection and temporary lower piling platform is likely to require works within the river. Mitigation for these temporary works will be considered as part of the sensitivity assessment and incorporated into the **Outline CEMP** [APP-346].

2.2.10 The proposed temporary use of land outside the current Order limits for the installation works would lead to the loss of woodland within the Coquet River Felton Park Local Wildlife Site (LWS). There may therefore be a requirement for additional compensatory habitat outside the Order limits. The maximum extent of the additional compensatory habitat would be approximately 3.4 ha in accordance with the approach detailed in Ancient Woodland Strategy Part A [APP-247]. Consultation is proposed with Northumberland County Council and Natural England to agree the approach that will be taken. A potential location for compensation land is shown on the **Potential Compensatory Habitat Location** figure in **Appendix A** and will require an extension of the Order limits in that location.

2.2.11 For the purposes of understanding how the proposed land stabilisation north of the River Coquet differs from those already contained in the Application, drawings of the proposed stabilisation works are provided in the **Permanent Works at the River Coquet** figure in **Appendix A**.

2.2.12 The benefits for this proposed change would be to:

a. Protect the River Coquet Site of Special Scientific Interest (SSSI) from damage in the future resulting from slope movements and deposition of large quantities of material into the watercourse.
b. Stabilise the northern slope such that the new bridge foundations are not adversely impacted by slope instability movement.
c. Stabilise the northern slope such that the existing bridge is not impacted by slope movement in the future.
d. Provide a position from which traditional foundations can be constructed for the northern pier and abutment.
e. Provide stabilisation of the slope such that the new bridge would not be destabilised.

2.2.13 A sensitivity assessment of the impact of including the land stabilisation works in the powers contained within the draft DCO [APP-014] is being undertaken to enable the consequences in terms of the environmental impacts already assessed to be understood. The aim of the assessment will be to consider whether the proposed land stabilisation works would alter the conclusions of the environmental impact assessment already undertaken. This will be concluded by and reported at

Deadline 4 (12 March 2021).

2.2.14 The scope of this sensitivity assessment and expected outcomes is shown in **Table 3** below, which represent preliminary indications subject to a fuller assessment.

Table 3 - Land stabilisation north of the River Coquet desktop sensitivity test

Aspect of Assessment	Construction / Operation	Likely Change to Significant Effects Y/N	Further Assessment likely required to Confirm Significance Y/N
Air Quality			
Dust and particulate matter from additional construction works	Construction	N	Y
Emissions from construction traffic	Construction	N	N
Emissions from operational traffic	Operation	N	N
Noise and Vibration			
Noise generated from construction activities	Construction	N	Y
Vibration generated from construction activities	Construction	N	Y
Noise from construction traffic	Construction	N	N
Noise from operational traffic	Operation	N	N
Landscape and Visual			
Changes to landscape character	Construction and operation	N	N
Changes to visual amenity	Operation and operation	N	Y
Cultural Heritage			

Aspect of Assessment	Construction / Operation	Likely Change to Significant Effects Y/N	Further Assessment likely required to Confirm Significance Y/N
Changes to the setting of heritage assets	Construction and operation	N	Y
Changes to below ground archaeology	Construction and operation	N	Y
Changes to historic landscapes	Construction and operation	N	Y
Biodiversity			
Impacts on Statutory and non-statutory sites	Construction and operation	N	Y
Changes to habitats	Construction and operation	N	Y
Impacts on protected and notable species	Construction and operation	N	Y
Changes to Biodiversity No Net Loss Assessment	Construction and operation	N/A	Y
Road Drainage and the Water Environment			
Changes to flood risk	Construction and operation	N	N
Changes to water quality	Construction	N	Y
Changes to groundwater flow patterns and levels	Construction and operation	N	Y
Changes to fluvial geomorphology	Construction and operation	N	Y
Geology and Soils			
Changes to land take	Construction and operation	N	Y

Aspect of Assessment	Construction / Operation	Likely Change to Significant Effects Y/N	Further Assessment likely required to Confirm Significance Y/N
Changes to land instability	Construction and operation	N	Y
Pollution of controlled waters	Construction	N	N
Population and Human Health			
Changes to temporary land use	Construction	N	N
Changes to permanent land take due to additional compensatory habitat	Operation	N	Y
Changes to recreational journey amenity	Construction and operation	N	N
Changes to direct, indirect and induced job generation	Construction	N	N
Changes to human health determinants	Construction and operation	N	N
Material Resources			
Consumption of materials	Construction	N	Y
Generation and disposal of waste to landfill	Construction	N	Y
Consumption of materials	Operation	N	N
Generation and disposal of waste to landfill	Operation	N	N
Climate			

Aspect of Assessment	Construction / Operation	Likely Change to Significant Effects Y/N	Further Assessment likely required to Confirm Significance Y/N
Effect of the Scheme on climate (Carbon / GHG) due to consumption of materials and transportation of materials	Construction	N	Y
Effect of the operation of the Scheme on climate (Carbon / GHG) due to end-user traffic and maintenance, repair and refurbishment.	Operation	N	N
Vulnerability of the Scheme to climate change	Construction and operation	N	N
Combined and Cumulative Assessment			
Assessment of Within Topic Combined Effects	Construction and Operation	N	N
Assessment of Cross Topic Combined Effects	Construction and Operation	N	N
Assessment of Cumulative Effects	Construction and Operation	N	N

2.2.15 A justification for the aspects of the assessments that would not require further assessment is provided below. The aspects of the assessments not discussed below have been scoped into the sensitivity assessment as shown in **Table 3**. However, where all aspects of the assessments have been scoped into the sensitivity assessment this is stated in the section below for completeness.

Air Quality

Construction Traffic

2.2.16 There would be extra construction vehicles due to the proposed land stabilisation works, but in the context of the Scheme these additional vehicle movements would be minimal. Therefore, there would not be a change in the assessment of significance for construction traffic emissions as presented in **Chapter 5: Air**

Quality Part A[APP-040].

Operational Traffic

2.2.17 The Scheme alignment and traffic data would remain the same with the land stabilisations works, meaning there would be no change to the operational air quality assessment presented in **Chapter 5: Air Quality** Part A [APP-040].

Noise and Vibration

Construction Traffic

2.2.18 There would be extra construction vehicles due to the proposed land stabilisation works, but in the context of the Scheme these additional vehicle movements would be minimal. Therefore, there would not be a change in the assessment of significance for construction traffic noise as presented in **Chapter 6: Noise and Vibration** Part A [APP-042].

Operational Traffic

2.2.19 The Scheme alignment and traffic data would remain the same with the land stabilisations works, meaning there would be no change to the operational noise and vibration assessment presented in **Chapter 6: Noise and Vibration** Part A [APP-042].

Landscape and Visual

Construction and Operation - Landscape Character

2.2.20 The land stabilisation works would not change the assessment of significance for landscape character as presented in the **Chapter 7: Landscape and Visual** Part A [APP-088]. The limited removal of woodland associated with the River Coquet valley would not be a substantially change to the perception of landscape character.

Cultural Heritage

2.2.21 No elements of the cultural heritage assessment have been scoped out of the sensitivity assessment. Additional work for both the construction and operational phases of the Scheme would be required as a result of the compensatory land described in **paragraph 2.2.102.2.10** of this document.

Biodiversity

2.2.22 No elements of the biodiversity assessment have been scoped out of the sensitivity assessment. There would not be a change in the assessment of significance as presented in **Chapter 9: Biodiversity** Part A [APP-048], with the inclusion of suitable mitigation and compensation. The mitigation and compensation will be progressed as part of the sensitivity assessment.

Road Drainage and the Water Environment

Construction and Operation - Flood Risk

2.2.23 As there are minimal changes to the Scheme design next to the watercourse, based on professional judgement, there would be no changes to the assessment of flood risk effects. The nearest flood risk receptors are Shothaugh Farm High Cottage and Otter House located approximately 800 m upstream of the River

Coquet bridge. The rip rap is not considered to increase the local flood risk to these receptors. Therefore, the flood risk assessment detailed in **Appendix 10.1: Flood Risk Assessment** Part A [APP-254] and **Chapter 10: Road Drainage and the Water Environment** Part A [APP-050] would remain the same. The measures set out in the **Outline CEMP** [APP-346] would also be applicable for the construction access, in particular the measures to reduce risk to construction workers during flood events.

Geology and Soils

Construction - Pollution of Controlled Waters

2.2.24 The mitigation set out in **Chapter 11: Geology and Soils** Part A [APP-052] and **Outline CEMP** [APP-346] for the management of potential contaminants would be applicable for the land stabilisation works to the north of River Coquet. With these measures in place, there would be no change to the outcomes of the assessment for the pollution of controlled waters.

Population and Human Health

Construction - Temporary Land Take

2.2.25 Due to the location of the additional temporary land take (i.e. located within Coquet River Felton Park LWS), the stabilisation works would not affect the viability of any agricultural businesses during construction. Therefore, the assessment of temporary land take on agricultural businesses would remain the same as presented in **Chapter 12: Population and Human Health** Part A [APP-054].

Construction and Operation - Recreational Journey Amenity

2.2.26 The proposed stabilisation works would not affect the assessment of recreational journey amenity presented in **Chapter 12: Population and Human Health** Part A [APP-054]. This is because there would already be disturbance at this location during the construction of the Scheme.

Construction - Direct, Indirect and Induced Job Generation

2.2.27 Based on professional judgement, there would be no change to the assessment of significance for economy and employment as presented in **Chapter 12: Population and Human Health** Part A [APP-054].

Construction and Operation - Human Health

2.2.28 As there would be no changes to the assessment of significance for air quality, noise and vibration as well as road drainage and the water environment, there would be no change to the assessment of significance for human health reported in **Chapter 12: Population and Human Health** Part A [APP-054].

Materials Resources

Operation

2.2.29 The operational consumption of materials and generation of waste would be minimal based on professional judgement and assessments of similar schemes. Therefore, the operational assessment for materials and waste would remain the same as reported in **Chapter 13: Material Resources** Part A [APP-056].

Climate

Operation - Greenhouse Gas Emissions

2.2.30 As there would be no change to the alignment of the Scheme and traffic data, there would be no change to the operational greenhouse gas assessment presented in **Chapter 14: Climate** Part A [APP-058].

Construction and Operation - Vulnerability of the Scheme to Climate Change

2.2.31 The mitigation set out in **Chapter 14: Climate** Part A [APP-058] and **Outline CEMP** [APP-346] for futureproofing the Scheme for climate change would be applicable for the land stabilisation works. With these measures in place, there would no change to the outcomes of the assessment.

Combined and Cumulative Assessment

Construction and Operation - Within Topic Combined Effects

2.2.32 As the further assessment work will assess the Scheme as whole (i.e. Part A and Part B together), a Within Topic combined effects assessment is not required.

Construction and Operation - Cross Topic Combined Effects

2.2.33 As there would be no change to the assessment of significance for all environmental topics due to the land stabilisations works, there would not be a change to the Cross Topic combined effects assessment presented in **Chapter 16: Assessment of Cumulative Effects** [APP-062].

Construction and Operation - Cumulative Effects

2.2.34 As there would be no change to the assessment of significance for all environmental topics due to the land stabilisations works, there would not be a change to the cumulative effect's assessment presented in **Chapter 16: Assessment of Cumulative Effects** [APP-062].

Changes to the Application

2.2.35 The changes to the application documents would be set out in a report and documents would be updated, if required, as detailed in **Table 4**.

Table 4 - Documents to be updated for land stabilisation north of the River Coquet

Document	Proposed Update
The draft DCO [APP-014]	Schedule 8 will require to be updated to include additional temporary land. There may also be a need for additional new rights for maintenance access in terms of Schedule 6.
Statement of Reasons [APP-018]	The Statement of reasons would need to be updated to include the additional plots to be acquired.
Case for the Scheme [APP-344]	The Case for the Scheme would need to be updated if the sensitivity assessment predicted that there would be a change on compliance with policy.
Appendix 9.24: Great Crested Newt Method	This may need to be updated to reflect changes in the Great Crested Newt method statement.

Document	Proposed Update
Statement River Coquet Part A [APP-250]	
Appendix 9.20 Biodiversity No Net Loss Assessment Part A	This may need to be updated to reflect changes in biodiversity no net loss.
Appendix 9.21: Ancient Woodland Strategy Part A [APP-247]	This would need to be updated to reflect changes in the ancient woodland strategy.
Figure 7.8: Landscape Mitigation Masterplan for Part A [APP-095]	This would need to be updated to reflect changes in the landscape design.
Book of Reference [OD-002]	The description of temporary and permanent land take would need to be updated.
National Policy Statement for National Networks Accordance Table [APP-345]	The accordance table would need to be updated if the sensitivity assessment predicted that there would be a change on compliance with policy.
Appendix 10.2: Water Framework Directive Part A [APP-255]	This would need to be updated to reflect changes in the Water Framework Directive assessment.
Habitat Regulations Assessment Report [APP-342]	This would need to be updated to reflect changes in the Habitat Regulation Assessment Report.
Outline CEMP [APP-346]	This would need to be updated if there was a change in required mitigation as a result of the sensitivity assessment.
Lands Plans [APP-006]	This would be updated to reflect changes in temporary and permanent land take.
Works Plan [APP-007]	This would be updated to reflect changes in temporary and permanent land take.
General Arrangement [APP-008]	This would be updated to reflect changes in temporary and permanent land take.
Traffic Regulation Plan [APP-010]	This would be updated to reflect changes in temporary access.
Consultation Report [APP-0221]	The Consultation Report will be updated to include consultation undertaken on the change to the proposals.

Consultation

2.2.36 As detailed in Advice Note 16, an applicant who intends to make a request for a material change to a DCO application is expected to consult all those prescribed in the Planning Act 2008 under section 42(a) to (d) who would be affected by the

proposed change (giving a minimum of 28 days. As the proposed change would include the acquisition of additional ground, it would be a material change. The Applicant proposes to consult relevant statutory bodies, including Environment Agency, Natural England and Northumberland County Council, as well as landowners on the proposals of land stabilisation to the north of River Coquet. Consultation with these relevant statutory bodies has started and is ongoing. As detailed in **paragraph 3.1.1**, consultation with all persons prescribed under Section 42 of the 2008 Act will be undertaken between 29 January 2021 – 25 February 2021.

2.2.37 The consultation will also be consistent with the procedures under The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017.

2.3 Construction access to the south bank from the north bank

2.3.1 The proposed works noted in **Section 2.2** of this document present an opportunity to provide a temporary access to the southern bank of the River Coquet by crossing the river from the temporary works on the northern bank instead of creating an access track down the southern river embankment as described in **Chapter 2 The Scheme** [APP-037]. The engineering solution for such a crossing is to use of a temporary bridge to span over the river. Temporary supports would be constructed on each side of the river then the main support beams would be assembled on the north bank and lifted into place, following which, the deck elements would be installed.

2.3.2 The works described in **Section 2.2** of this document include the construction of a temporary haul road which extends to the north riverbank. A temporary working area is already proposed on the south bank adjacent to the southern pier. It is proposed to include a temporary bridge to provide an access between these two working areas. A small area of additional temporary working area across the river will be required to provide this crossing, as shown in the **Temporary Works at the River Coquet** figure in **Appendix A**.

2.3.3 Whilst a detailed design of the solution is yet to be completed, in accordance with good engineering practicce it is expected that the solution would comprise a temporary 'open truss' type structure spanning the main river channel and seated on temporary supports each side of the river.

2.3.4 In addition, it is anticipated that there would be some temporary river training works along each riverbank, although it is intended that this should be optimised to comprise as much of the permanent scour protection works as is practicable, during the development of the detailed design of the Scheme. To the north bank the scour protection works are associated with the stabilisation requirements referred to in **paragraphs 2.2.1 to 2.2.11**. To the south, the Applicant is reviewing the need for scour protection on the southern bank in light of the latest ground investigation information and taking into account the presence of scour protection for the existing pier. Given prevailing ground conditions, such protection may be required in order to provide consistency with the existing structure which includes scour protection of the pier, and to assure the structural integrity of the new pier from the risk of channel movement over the design life. Erosion protection measures will also offer protection to the reinstated ground disturbed by the construction works close to the river edge. If required it is proposed to use rip-rap stone on the southern riverbank to act as erosion protection, although alternative options and potential refinements will be reviewed with relevant bodies through the design development. As a precaution, and in order to give fair notice of possible further changes, the maximum extent of the potential scour protection on the southern bank is shown on **Permanent Works at the River Coquet** figure in **Appendix A**.

2.3.5 The benefits for this proposed change would be to:

- **a.** Reduce impact on the southern bank SSSI by removing the need for vehicular access from the south.
- **b.** Reduce long-term impact to southern escarpment landscape
- **c.** Reduced spread of construction activity over the area, leaving some areas undisturbed and increasing coppicing only activity as opposed to full clearance

to preserve more of the SSSI. This undisturbed area equates to circa 500m^2. The additional area over the river is 360m^2, showing a net benefit of 140m^2.

2.3.6 A sensitivity assessment of the impact of including the changes to construction access to the south bank of the River Coquet in the powers contained within the draft DCO [APP-014] is being undertaken to enable the consequences in terms of the environmental impacts already assessed to be understood. The assessment will be to consider whether the proposed changes to the construction access for the south bank would alter the conclusions of the environmental impact assessment already undertaken. The construction access would only be altered if the stabilisation works described in **Section 2.2** of this document are taken forward. Therefore, the sensitivity assessment will only cover the effects of the construction access beyond that reported in **Section 2.2** of this document. This will be concluded by and reported at Deadline 4 (12 March 2021).

2.3.7 The scope of this sensitivity assessment and expected outcomes is shown in **Table 5** below, which represent preliminary indications subject to a fuller assessment.

Table 5 - Construction access to the south bank from the north bank of the River Coquet desktop sensitivity test

Aspect of Assessment	Construction / Operation	Likely Change to Significant Effects Y/N	Further Assessment likely required to Confirm Significance Y/N
Air Quality			
Dust and particulate matter from additional construction works	Construction	N	Y
Emissions from construction traffic	Construction	N	N
Emissions from operational traffic	Operation	N	N
Noise and Vibration			
Noise generated from construction activities	Construction	N	Y
Vibration generated from construction activities	Construction	N	Y
Noise from construction traffic	Construction	N	N

Aspect of Assessment	Construction / Operation	Likely Change to Significant Effects Y/N	Further Assessment likely required to Confirm Significance Y/N
Noise from operational traffic	Operation	N	N
Landscape and Visual			
Changes to landscape character	Construction and operation	N	N
Changes to visual amenity	Construction	N	Y
Changes to visual amenity	Operation	N	N
Cultural Heritage			
Changes to the setting of heritage assets	Construction and operation	N	N
Changes to below ground archaeology	Construction and operation	N	N
Changes to historic landscapes	Construction and operation	N	N
Biodiversity			
Impacts on Statutory and non-statutory sites	Construction	N	Y
Impacts on Statutory and non-statutory sites	Operation	N	N
Changes to habitats	Construction	N	Y
Changes to habitats	Operation	N	N
Impacts on protected and notable species	Construction	N	Y
Impacts on protected and notable species	Operation	N	N

Aspect of Assessment	Construction / Operation	Likely Change to Significant Effects Y/N	Further Assessment likely required to Confirm Significance Y/N
Changes to Biodiversity No Net Loss Assessment	Construction	N/A	Y
Changes to Biodiversity No Net Loss Assessment	Operation	N	N
Road Drainage and the Water Environment			
Changes to flood risk	Construction	N	N
Changes to flood risk	Operation	N	N
Changes to water quality	Construction	N	Y
Changes to water quality	Operation	N	N
Changes to groundwater flow patterns and levels	Construction	N	Y
Changes to groundwater flow patterns and levels	Operation	N	N
Changes to fluvial geomorphology	Construction	Y	Y
Changes to fluvial geomorphology	Operation	N	N
Geology and Soils			
Changes to land take	Construction	N	N
Changes to land take	Operation	N	N
Pollution of controlled waters	Construction	N	N

Aspect of Assessment	Construction / Operation	Likely Change to Significant Effects Y/N	Further Assessment likely required to Confirm Significance Y/N
Pollution of controlled waters	Operation	N	N
Population and Human Health			
Changes to temporary land use	Construction	N	N
Changes to permanent land take	Operation	N	N
Changes to recreational journey amenity	Construction	N	N
Changes to recreational journey amenity	Operation	N	N
Recreation along the River Coquet	Construction	N	Y
Recreation along the River Coquet	Operation	N	N
Changes to direct, indirect and induced job generation	Construction	N	N
Changes to direct, indirect and induced job generation	Operation	N	N
Changes to human health determinants	Construction	N	N
Changes to human health determinants	Operation	N	N
Material Resources			
Consumption of materials	Construction	N	Y

Aspect of Assessment	Construction / Operation	Likely Change to Significant Effects Y/N	Further Assessment likely required to Confirm Significance Y/N
Generation and disposal of waste to landfill	Construction	N	Y
Consumption of materials	Operation	N	N
Generation and disposal of waste to landfill	Operation	N	N
Climate			
Effect of the Scheme on climate (Carbon / GHG) due to consumption of materials and transportation of materials	Construction	N	Y
Effect of the operation of the Scheme on climate (Carbon / GHG) due to end-user traffic and maintenance, repair and refurbishment.	Operation	N	N
Vulnerability of the Scheme to climate change	Construction	N	N
Vulnerability of the Scheme to climate change	Operation	N	N
Combined and Cumulative Assessment			
Assessment of Within Topic Combined Effects	Construction and Operation	N	N
Assessment of Cross Topic Combined Effects	Construction	N	Y

Aspect of Assessment	Construction / Operation	Likely Change to Significant Effects Y/N	Further Assessment likely required to Confirm Significance Y/N
Assessment of Cross Topic Combined Effects	Operation	N	N
Assessment of Cumulative Effects	Construction	N	N
Assessment of Cumulative Effects	Operation	N	N

2.3.8 A justification for the aspects of the assessments that would not require further assessment is provided below. The aspects of the assessments not discussed below have been scoped into the sensitivity assessment as shown in **Table 5**. However, where all aspects of the assessments have been scoped into the sensitivity assessment this is stated in the section below for completeness.

Air Quality

Construction Traffic

2.3.9 There would be extra construction vehicles due to the changes to the construction access for the south bank of the River Coquet, but in the context of the Scheme these additional vehicle movements would be minimal. Therefore, there would not be a change in the assessment of significance for construction traffic emissions as presented in **Chapter 5: Air Quality** Part A [APP-040].

Operational Traffic

2.3.10 The Scheme alignment and traffic data would remain the same with the changes to the construction access, meaning there would be no change to the operational air quality assessment presented in **Chapter 5: Air Quality** Part A [APP-040].

Noise and Vibration

Construction Traffic

2.3.11 There would be extra construction vehicles due to changes to the construction access for the south bank of the River Coquet, but in the context of the Scheme these additional vehicle movements would be minimal. Therefore, there would not be a change in the assessment of significance for construction traffic noise as presented in **Chapter 6: Noise and Vibration** Part A [APP-042].

Operational Traffic

2.3.12 The Scheme alignment and traffic data would remain the same with the changes to the construction access, meaning there would be no change to the operational noise and vibration assessment presented in **Chapter 6: Noise and Vibration** Part A [APP-042].

Landscape and Visual

Construction and Operation - Landscape Character

2.3.13 The changes to the construction access for the south bank of the River Coquet would not change the assessment of significance for landscape character as presented in the **Chapter 7: Landscape and Visual** Part A [APP-088].

Cultural Heritage

Construction

2.3.14 Due to the topography and nature of the works, the proposed changes to the construction access would not affect the assessment of significance for cultural heritage as presented in **Chapter 8: Cultural Heritage** Part A [APP-046].

Operation

2.3.15 As the works are temporary, there would not be a change in the assessment of significance as presented in **Chapter 8: Cultural Heritage** Part A [APP-046] during operation.

Biodiversity

Construction

2.3.16 No elements of the biodiversity assessment have been scoped out of the sensitivity assessment. There would not be a change in the assessment of significance as presented in **Chapter 9: Biodiversity** Part A [APP-048], with the inclusion of suitable mitigation. The mitigation will be progressed as part of the sensitivity assessment.

Operation

2.3.17 As the works are temporary, there would not be a change in the assessment of significance as presented in **Chapter 9: Biodiversity** Part A [APP-048] during operation.

Road Drainage and the Water Environment

Construction and Operation – Flood Risk

2.3.18 During construction and operation, the proposals may increase flood levels locally but this would not change the assessment of flood risk presented in **Appendix 10.1: Flood Risk Assessment** Part A [APP-254] and **Chapter 10: Road Drainage and the Water Environment** Part A [APP-050] due to the distance between the proposals and closest receptors. The nearest flood risk receptors are Shothaugh Farm High Cottage and Otter House located approximately 800 m upstream of the River Coquet bridge. The measures set out in the **Outline CEMP** [APP-346] would also be applicable for the construction access, in particular the measures to reduce risk to construction workers during flood events.

Operation

2.3.19 As the works are temporary, there would not be a change in the assessment of significance as presented in **Chapter 10: Road Drainage and the Water Environment** Part A [APP-050] during operation.

Geology and Soils

Construction

2.3.20 The mitigation set out in **Chapter 11: Geology and Soils** Part A [APP-052] and **Outline CEMP** [APP-346] for the management of potential contaminants would be applicable for the construction access across for the south bank of the River Coquet. With these measures in place, there would be no change to the outcomes of the assessment for the pollution of controlled waters.

Operation

2.3.21 As the works are temporary, there would not be a change in the assessment of significance as presented in **Chapter 11: Geology and Soils** Part A [APP-052] during operation.

Population and Human Health

Construction - Temporary Land Take

2.3.22 The construction access would require temporary rights over the River Coquet but would not require additional temporary or permanent land take. Therefore, the assessment of land take presented in **Chapter 12: Population and Human Health** Part A [APP-054] would remain the same.

Construction - Recreational Journey Amenity

2.3.23 The proposed changes to the construction access would not affect the assessment of recreational journey amenity presented in **Chapter 12: Population and Human Health** Part A [APP-054]. This is because there would already be disturbance at this location during the construction of the Scheme.

Construction - Direct, Indirect and Induced Job Generation

2.3.24 Based on professional judgement, there would be no change to the assessment of significance for economy and employment as presented in **Chapter 12: Population and Human Health** Part A [APP-054].

Construction – Human Health

2.3.25 As there would be no changes to the assessment of significance for air quality, noise and vibration as well as road drainage and the water environment, there would be no change to the assessment of significance for human health reported in **Chapter 12: Population and Human Health** Part A [APP-054].

Operation

2.3.26 As the works are temporary, there would not be a change in the assessment of significance as presented in **Chapter 12: Population and Human Health** Part A [APP-054] during operation.

Materials Resources

Operation

2.3.27 The operational consumption of materials and generation of waste would be minimal based on professional judgement and assessments of similar schemes. Therefore, the operational assessment for materials and waste would remain the same as reported in **Chapter 13: Material Resources** Part A [APP-056].

Climate

Operation - Greenhouse Gas Emissions

2.3.28 As there would be no change to the alignment of the Scheme and traffic data, there would be no change to the operational greenhouse gas assessment presented in **Chapter 14: Climate** Part A [APP-058].

Construction - Vulnerability of the Scheme to Climate Change

2.3.29 The mitigation set out in **Chapter 14: Climate** Part A [APP-058] and **Outline CEMP** [APP-346] for futureproofing the Scheme for climate change would be applicable for the construction access. With these measures in place, there would no change to the outcomes of the assessment.

Operation- Vulnerability of the Scheme to Climate Change

2.3.30 As the works are temporary, there would not be a change in the assessment of significance as presented in **Chapter 14: Climate** Part A [APP-058] during operation.

Combined and Cumulative Assessment

Construction and Operation - Within Topic Combined Effects

2.3.31 As the further assessment work will assess the Scheme as whole (i.e. Part A and Part B together), a Within Topic combined effects assessment is not required.

Construction and Operation - Cumulative Effects

2.3.32 There could potentially be a significant effect on fluvial geomorphology due to the changes in the construction access for the south bank of the River Coquet. However, due to the location of the cumulative schemes identified in **Chapter 16: Assessment of Cumulative Effect**s [APP-062], there would be no significant interaction between the Scheme and the cumulative schemes for the River Coquet.

Changes to the Application

2.3.33 The changes to the application documents would be set out in a report and documents would be updated, if required, as detailed in **Table 6**.

Table 6 - Documents to be updated for changes to construction access to the south bank from the north bank of the River Coquet

Document	Proposed Update
The draft DCO [APP-014]	Schedule 8 will require to be updated to include additional rights.
Statement of Reasons [APP-018]	The Statement of reasons would need to be updated to include the additional rights that would be required.
Case for the Scheme [APP-344]	The Case for the Scheme would need to be updated if the sensitivity assessment predicted that there would be a change on compliance with policy.

Document	Proposed Update
Appendix 9.21: Ancient Woodland Strategy Part A [APP-247]	This would need to be updated to reflect changes in the ancient woodland strategy.
Figure 7.8: Landscape Mitigation Masterplan for Part A [APP-095]	This would need to be updated to reflect changes in the landscape design.
Book of Reference [OD-002]	The description of the temporary rights would need to be updated.
National Policy Statement for National Networks Accordance Table [APP-345]	The accordance table would need to be updated if the sensitivity assessment predicted that there would be a change on compliance with policy.
Appendix 10.2: Water Framework Directive Part A [APP-255]	This would need to be updated to reflect changes in the Water Framework Directive assessment.
Habitat Regulations Assessment Report [APP-342]	This would need to be updated to reflect changes in the Habitat Regulation Assessment Report.
Appendix 9.20 Biodiversity No Net Loss Assessment Part A	This may need to be updated to reflect changes in biodiversity no net loss.
Outline CEMP [APP-346]	This would need to be updated if there was a change in required mitigation as a result of the sensitivity assessment.
Lands Plans [APP-006]	This would be updated to reflect changes in temporary rights.
Works Plan [APP-007]	This would be updated to reflect changes in temporary rights.
General Arrangement [APP-008]	This would be updated to reflect changes in temporary rights.
Traffic Regulation Plan [APP-010]	This would be updated to reflect changes in temporary access.
Consultation Report [APP-0221]	The Consultation Report will be updated to include consultation undertaken on the change to the proposals.

Consultation

2.3.34 As detailed in Advice Note 16, an applicant who intends to make a request for a material change to a DCO application is expected to consult all those prescribed in the Planning Act 2008 under section 42(a) to (d) who would be affected by the proposed change (giving a minimum of 28 days. As the proposed change would include the acquisition of additional ground, it would be a material change. As detailed in **paragraph 3.1.1**, consultation with all persons prescribed under Section 42 of the 2008 Act will be undertaken between 29 January 2021 – 25 February 2021.

2.3.35 The consultation will also be consistent with the procedures under The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017.

3 CONCLUSION AND PROPOSED NEXT STEPS

3.1.1 Taking into account the guidance in PINS Advice Note 16, it is proposed that:

a. The Applicant submits its proposal to make changes to the Application in document **TR010059** – (10 December 2020)

b. The Examining Authority should consider this procedural proposal and issue advice about the procedural implications of the proposed changes at or following the first preliminary meeting – (15 December 2020)

c. Sensitivity assessments of the is undertaken and consultation documentation is prepared:
- Changes to temporary and permanent earthworks;
- Land stabilisation north of the River Coquet; and
- Changes to construction access to the south bank of River Coquet from the north bank.

d. Consultation on proposed changes and updated environmental information – 29 January 2021 – 25 February 2021.

e. Submission of formal change request, together with full supporting documents at Deadline 4 – (12 March 2021)

f. Subsequent procedure will depend on whether the Infrastructure Planning (Compulsory Acquisition) Regulations 2010 are engaged. If the 2010 Regulations are engaged then the indicative timetable set out in **Table 7** is proposed.

Table 7 – Indicative Timetable

Procedure	Deadline
Deadline for decision on acceptance of change request	9 April 2021
Notice to affected persons	12 April 2021
First newspaper notice	15 April 2021
Second newspaper notice	22 April 2021
Deadline for representations	20 May 2021
Submission of Hydraulic modelling & geomorphological information to ExA	25 May 2021 Deadline 8
Issue of updated examination timetable and preliminary consideration of issues by ExA	3 June 2021
Issue of written questions by ExA	3 June 2021
Notification of hearing date by ExA (if required)	3 June 2021
Deadline for written representations and responses to written questions	10 June 2021
Date for response to written representations and comments	17 June 2021

Procedure	Deadline
on responses to written questions	
Hearing date (if required)	24 June 2021
Deadline for post hearing submissions	2 July 2021 (existing deadline 11)

Appendix A: Figures

Indicative Earthwork Change Locations

Date Saved: 08/12/2020 15:12:14 User Name: UKRJM017

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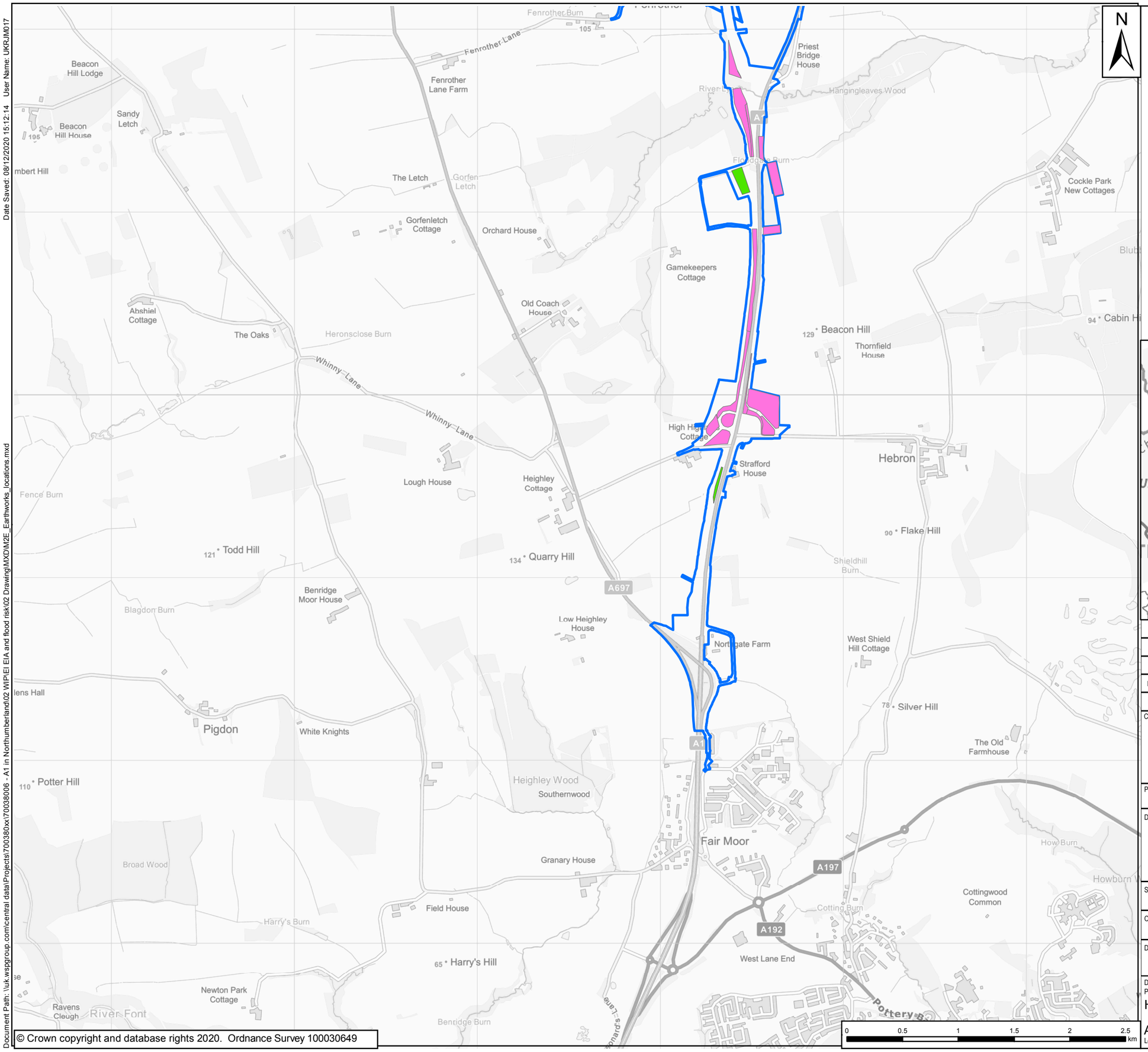

Rev	Date	Description	By	Chk'd	App'd
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Client: highways england

Project Title: A1 in Northumberland: Morpeth to Ellingham

Drawing Title: Indicative Earthwork Change Locations Page 1 of 5

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Drawing Status: For Information

Suitability: S1

Drawing Number Project	Originator	Volume	Project Ref. No.
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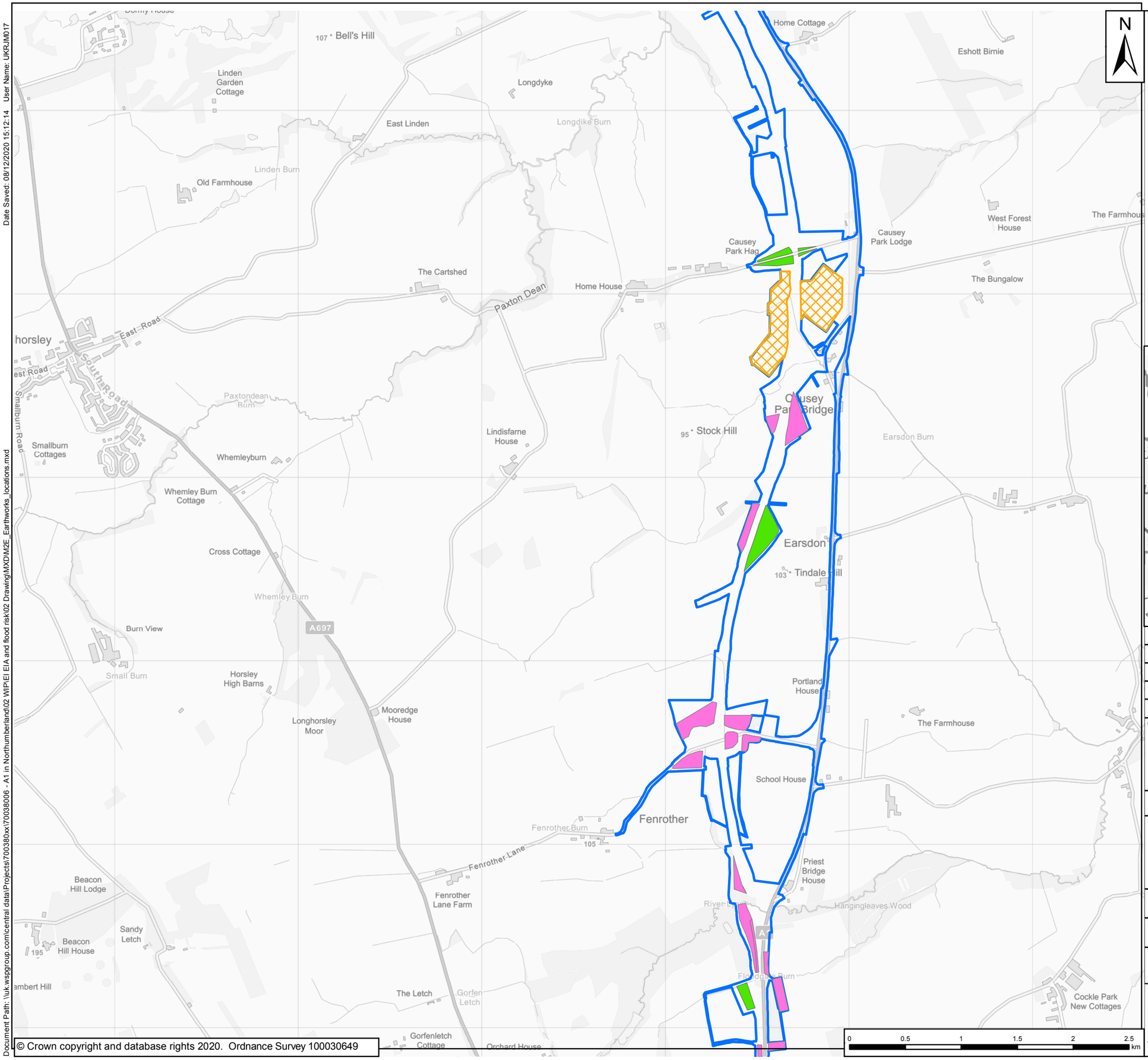
A2E Location	**RP Type**	**LE Role**	**2130 Number**

Revision: P01



P01	09/09/2020	First Issue	GH	LM	KS
Rev	Date	Description	By	Chk'd	App'd

Client: highways england

Project Title: A1 in Northumberland: Morpeth to Ellingham

Drawing Title: Indicative Earthwork Change Locations Page 2 of 5

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Drawing Status: For Information

Suitability: S1

Drawing Number: Project HE551459 | Originator WSP | Volume

Project Ref. No.: 70044137

A2E Location | RP Type | LE Role | 2130 Number

Revision: P01

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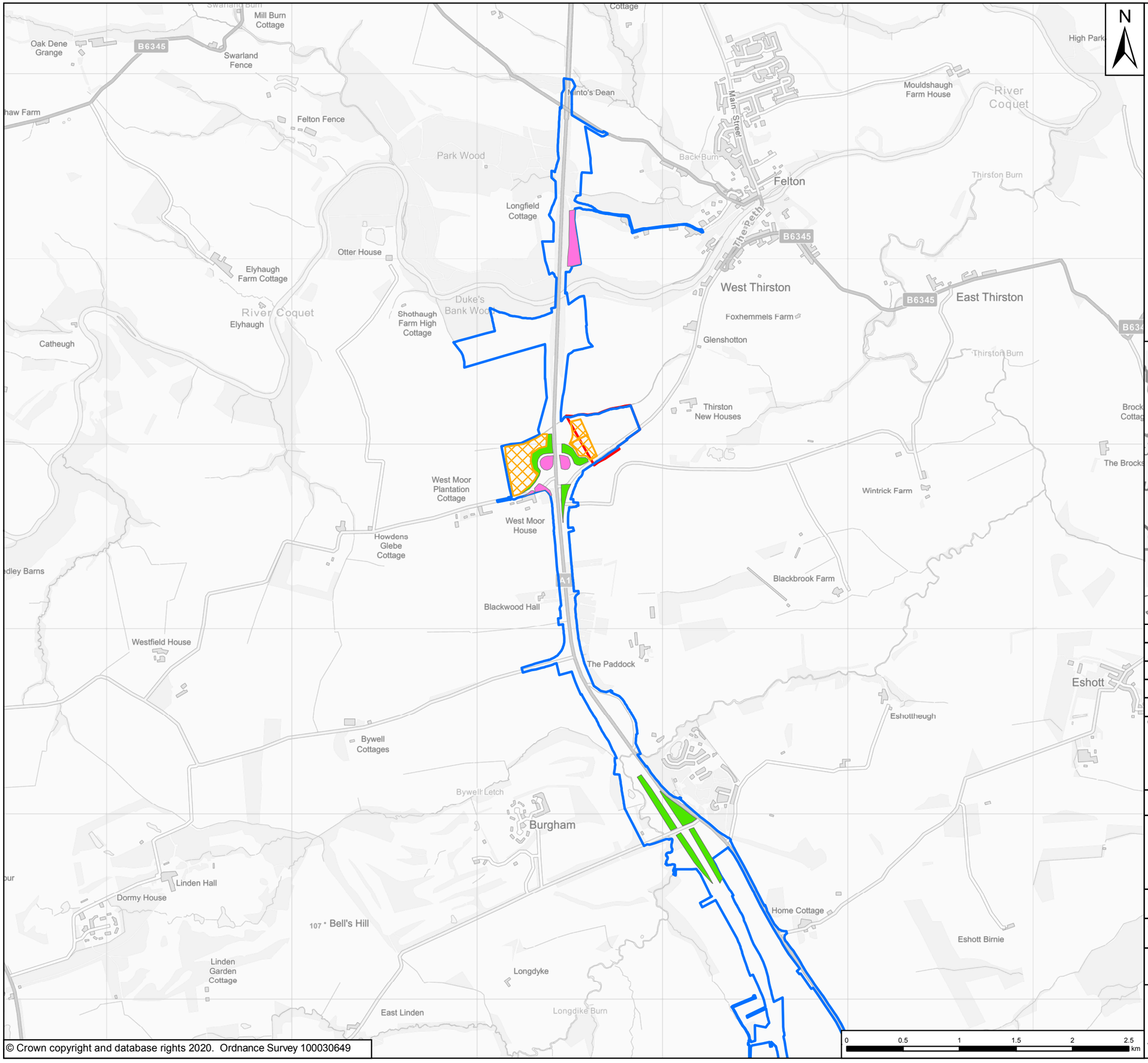

Key

- A2E Order Limits
- M2F Order Limits

Permanent Earthworks

- Changes to gradient and height of proposed earthworks
- Changes to gradient and height of proposed earthworks of Parameter 4 or 5 in Part A

Temporary Earthworks

- Borrow Pit
- Temporary Storage

Rev	Date	Description	By	Chk'd	App'd
P01	09/09/2020	First Issue	GH	LM	KS

Client: highways england

Project Title: A1 in Northumberland: Morpeth to Ellingham

Drawing Title: Indicative Earthwork Change Locations Page 3 of 5

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Drawing Status: For Information

Suitability: S1

Drawing Number: Project HE551459 | Originator WSP | Volume

A2E Location | RP Type | LE Role | 2130 Number

Project Ref. No.: 70044137

Revision: P01

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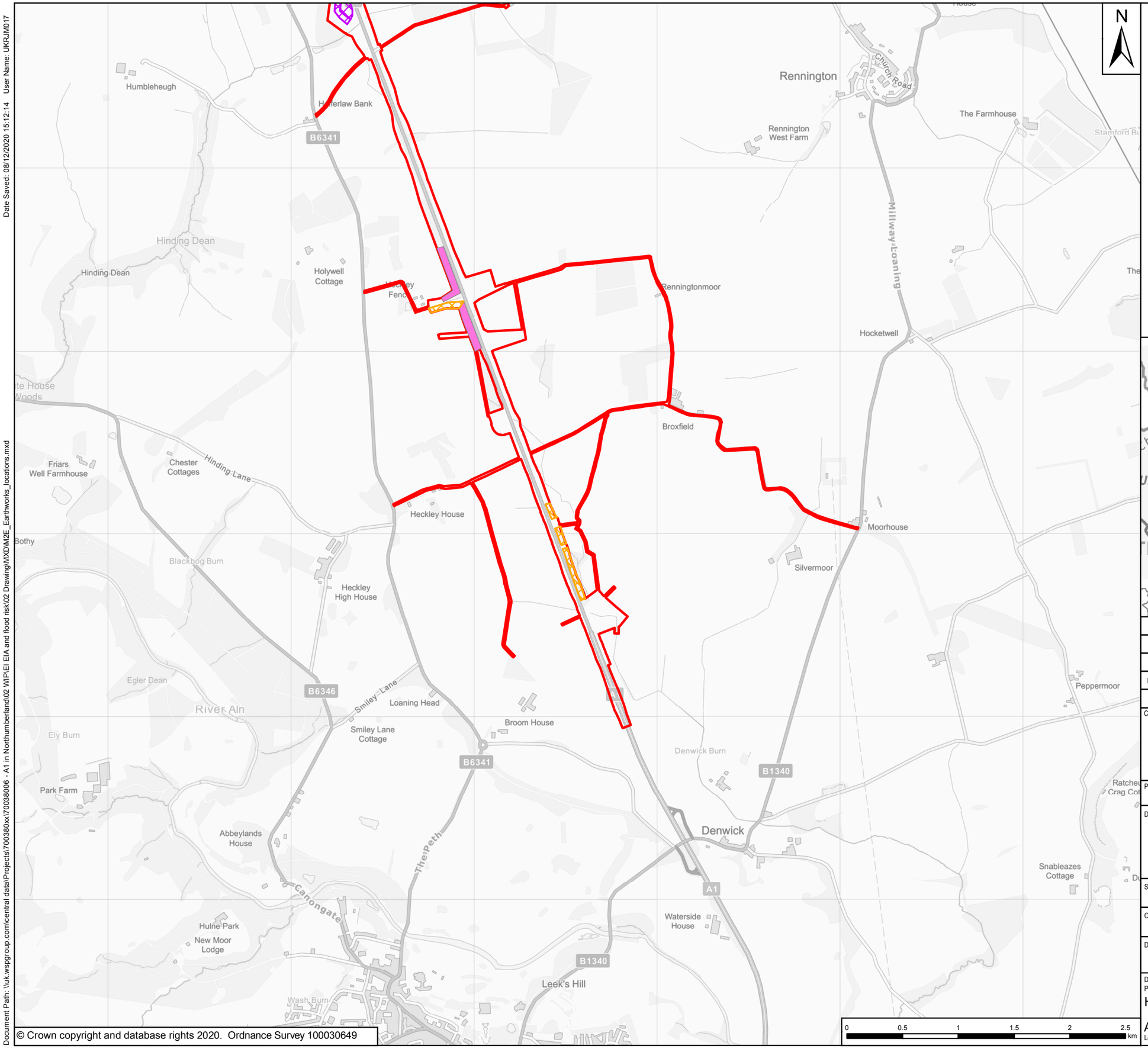

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Client: highways england

Project Title: A1 in Northumberland: Morpeth to Ellingham

Drawing Title: Indicative Earthwork Change Locations Page 4 of 5

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Drawing Status: For Information

Suitability: S1

Drawing Number: Project HE551459 | Originator WSP | Volume

A2E Location | RP Type | LE Role | 2130 Number

Project Ref. No.: 70044137

Revision: P01

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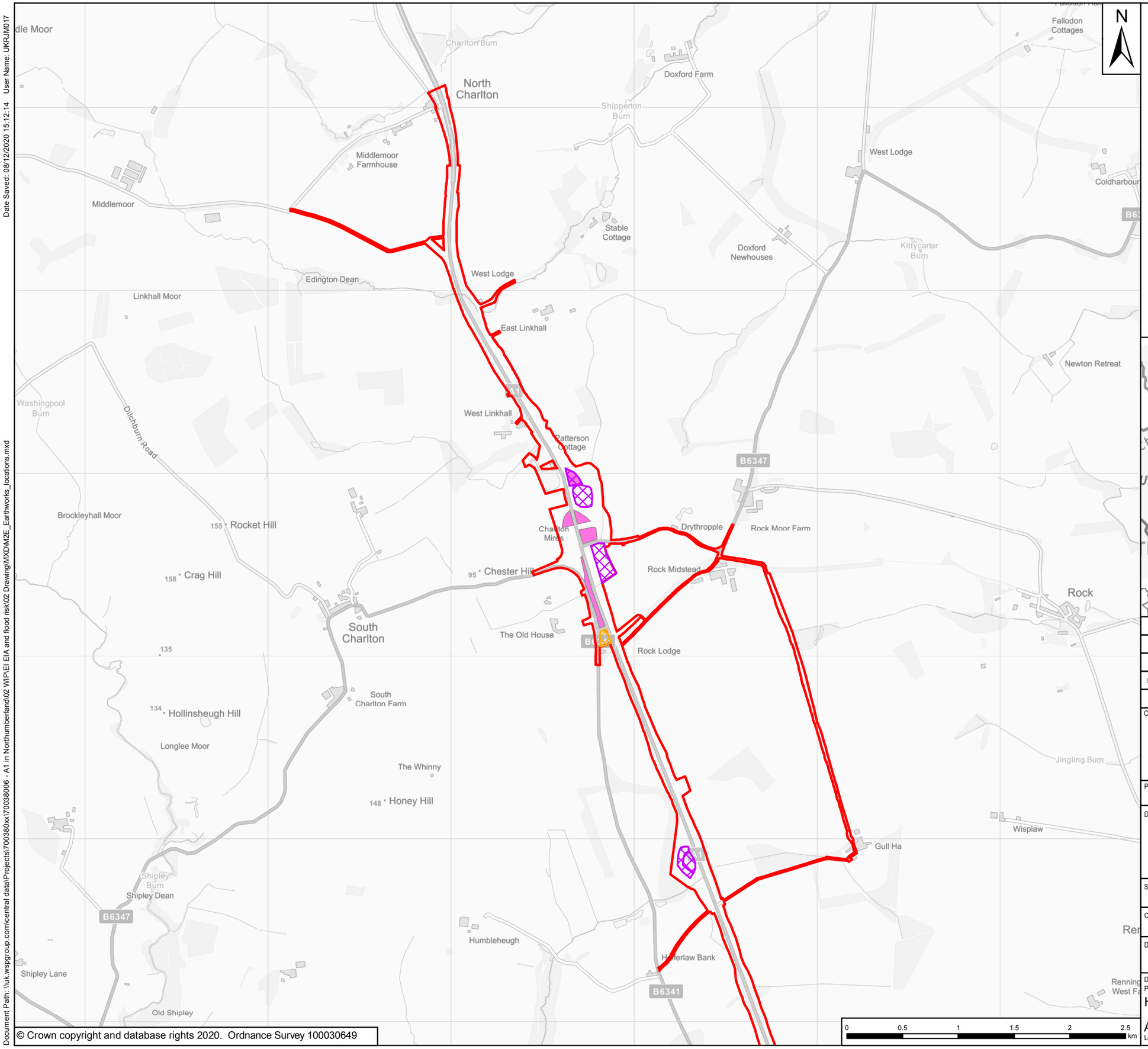

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Client: highways england

Project Title: A1 in Northumberland: Morpeth to Ellingham

Drawing Title: Indicative Earthwork Change Locations Page 5 of 5

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Drawing Status: For Information

Suitability: S1

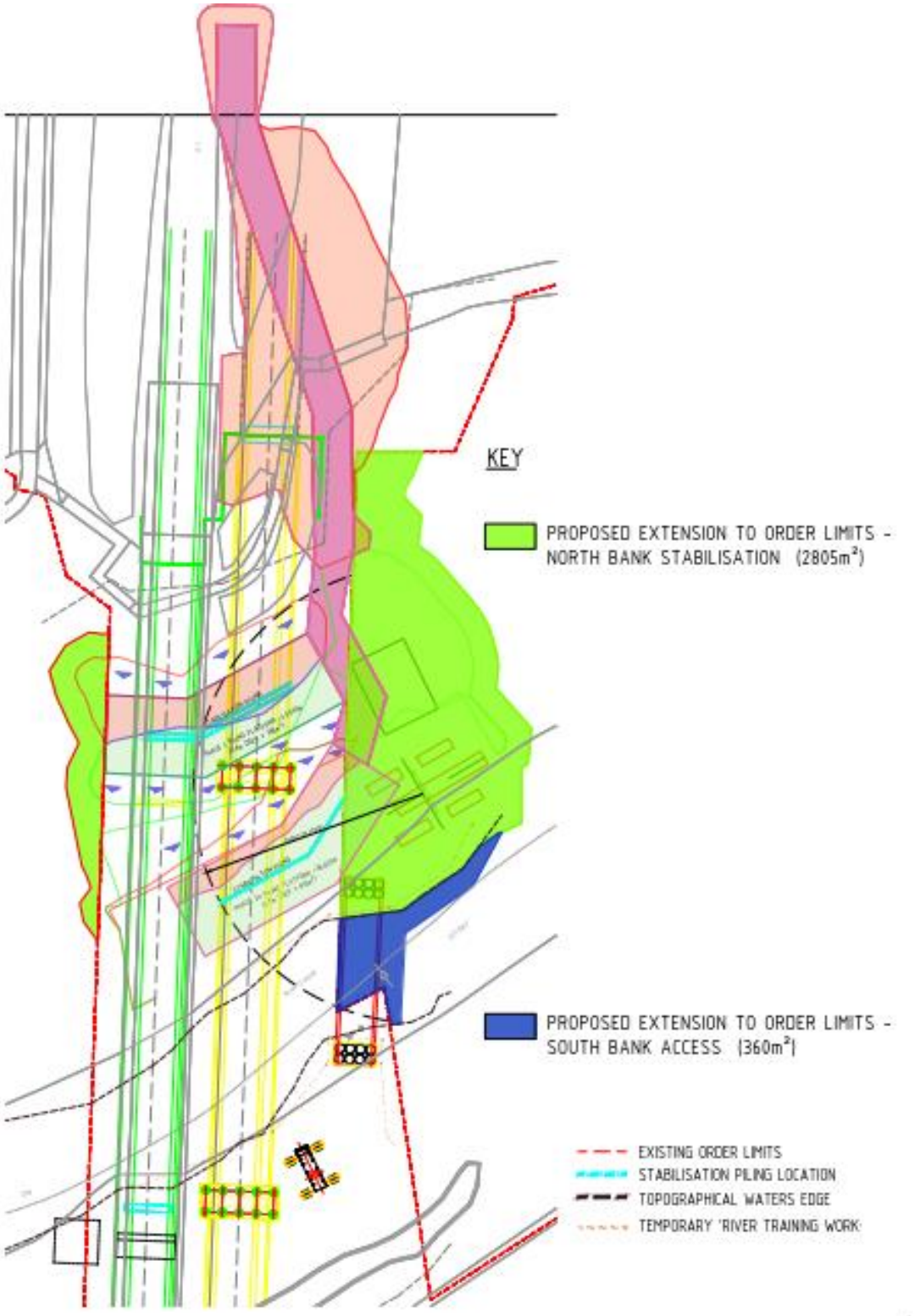
Drawing Number: Project HE551459 | Originator WSP | Volume

A2E Location | RP Type | LE Role | 2130 Number

Project Ref. No.: 70044137

Revision: P01

Temporary Works at the River Coquet



Permanent Works at the River Coquet

KEY:

- 3m wide strip of land required for erosion control
- Proposed extension to Order limits - North bank stabilisation
- Existing Order limits
- Stabilisation piling location

RIVER COQUET

A1 NORTHBOUND
(EXISTING BRIDGE)

A1 SOUTHBOUND
(PROPOSED BRIDGE)

RIVER COQUET

Potential Compensatory Habitat Location

Order limits

Proposed extension to Order limits - compensatory habitat

Appendix C

VISUAL EFFECTS SCHEDULE

Table C-1 - Viewpoints Visual Effects Schedule – please refer to Appendix 7.2: Viewpoints Visual Effects Schedule Part A [APP-217]

Viewpoint Reference/ Sensitivity	Description of impact (in addition to those in Appendix 7.2 Viewpoints Visual Effects Schedule Part A [APP-217])		Environmental Statement Effects			Stabilisation Works (ES Addendum)		
			Construction	**Operation Year 1**	**Operation Year 15**	**Construction**	**Operation Year 1**	**Operation Year 15**
Viewpoint 18: View looking north-west from PRoW (422/020)	Construction: – The awareness of the additional removal of existing woodland from the north side of the River Coquet valley at a distance of approximately 100-150 m, totalling 405 m^2 to the west, and 2,400 m^2 to the east of the existing A1 bridge crossing. – The presence of additional land stabilisation activity in the form of sheet piling, and associated plant, representing a perceptibly larger working footprint (additional 2,805 m^2) within the previously assessed construction activity associated with the bridge supports and deck. Operation – Although greater appreciation of the river corridor would be experienced, there would be awareness at distance of retaining sheet piling on the opposite side of the valley and areas of woodland that would not be replanted, leaving open unwooded areas. – The partial re-planting of woodland within the areas (405 m^2 to the west, and	Magnitude of Impact	Minor	Minor	No Change	Minor	Minor	Minor
High		Significance of effect	**Moderate Adverse**	Slight Adverse	Neutral	**Moderate Adverse**	Slight Adverse	Slight Adverse

Viewpoint Reference/ Sensitivity	Description of impact (in addition to those in Appendix 7.2 Viewpoints Visual Effects Schedule Part A [APP-217])		Environmental Statement Effects			Stabilisation Works (ES Addendum)		
			Construction	**Operation Year 1**	**Operation Year 15**	**Construction**	**Operation Year 1**	**Operation Year 15**
	2,400 m^2 to the east of the existing A1 bridge crossing) which would be subject to vegetation removal during the construction period. This would be constrained by the need for offsets from above and below ground structures where planting cannot be established.							
Viewpoint 19: View looking north from PRoW (422/020)	Construction – The awareness of the additional removal of existing woodland from the north side of the River Coquet valley at a distance of approximately 100-150 m, totalling 405 m^2 to the west, and 2,400 m^2 to the east of the existing A1 bridge crossing. – The presence of additional land stabilisation activity in the form of sheet piling, and associated plant, representing a perceptibly larger working footprint (additional 2,805 m^2) within the previously assessed construction activity associated with the bridge supports and deck. Operation – Although greater appreciation of the river corridor would be experienced, there would be awareness of retaining sheet piling on the opposite	Magnitude of Impact	Moderate	Minor	Minor	Moderate	Minor	Minor
High		Significance of effect	**Moderate Adverse**	Slight Beneficial	Slight Beneficial	**Moderate Adverse**	Slight Adverse	Slight Adverse

Viewpoint Reference/ Sensitivity	Description of impact (in addition to those in Appendix 7.2 Viewpoints Visual Effects Schedule Part A [APP-217])		Environmental Statement Effects			Stabilisation Works (ES Addendum)		
			Construction	Operation Year 1	Operation Year 15	Construction	Operation Year 1	Operation Year 15
	side of the valley and areas of woodland that would not be replanted, leaving open unwooded areas. – The partial re-planting of woodland within the areas (405 m^2 to the west, and 2,400 m^2 to the east of the existing A1 bridge crossing) which would be subject to vegetation removal during the construction period. This would be constrained by the need for offsets from above and below ground structures.							
Viewpoint 20: View south from 422/020 & 422/002	Construction – Reorientation of the views to the north as a result of the diversion during construction would open up awareness of construction activity and woodland clearance to the north side of the valley – The awareness of the further mitigation planting forming the additional area within the Woodland Creation Area to the south-west, on the edge of the proposed cutting slope. Operation – The planting of an additional 3.1 ha woodland in addition to the Woodland Creation Area, to the south of the existing ancient	Magnitude of Impact	Moderate	Minor	Minor	Moderate	Minor	Minor
High		Significance of effect	**Moderate Adverse**	Slight Beneficial	Slight Beneficial	**Moderate Adverse**	Slight Adverse	Slight Adverse

Viewpoint Reference/ Sensitivity	Description of impact (in addition to those in Appendix 7.2 Viewpoints Visual Effects Schedule Part A [APP-217])		Environmental Statement Effects			Stabilisation Works (ES Addendum)		
			Construction	Operation Year 1	Operation Year 15	Construction	Operation Year 1	Operation Year 15
	– woodland to the south of the River Coquet. – Once woodland is established in the foreground awareness of the extended woodland to the south would be screened. – Views of the River Coquet via the underpass would re-orientate views to the north and there would be awareness of retaining sheet piling on the opposite side of the valley and areas of woodland that would not be replanted, leaving open unwooded areas. – The partial re-planting of woodland within the areas (405 m^2 to the west, and 2,400 m^2 to the east of the existing A1 bridge crossing) which would be subject to vegetation removal during the construction period. This would be constrained by the need for offsets from above and below ground structures.							
Viewpoint 21: View looking south-west from St Oswalds Way	Construction – The awareness of the additional removal of existing woodland from the north side of the River Coquet valley, totalling 405 m^2 to the west, and 2,400 m^2 to the east of the existing A1 bridge crossing would be substantially screened by existing	Magnitude of Impact	Minor	Minor	No Change	Minor	Minor	No Change
High		Significance of effect	Slight Adverse	Slight Adverse	Neutral	Slight Adverse	Slight Adverse	Neutral

Viewpoint Reference/ Sensitivity	Description of impact (in addition to those in Appendix 7.2 Viewpoints Visual Effects Schedule Part A [APP-217])		Environmental Statement Effects			Stabilisation Works (ES Addendum)		
			Construction	Operation Year 1	Operation Year 15	Construction	Operation Year 1	Operation Year 15
	retained woodland in the foreground; – The presence of additional land stabilisation activity, in the form of sheet piling, and associated plant, representing a larger working footprint (additional 2,805 m^2), however, this would be partially obscured by existing retained woodland in the foreground. Operation – The partial re-planting of woodland within the areas (405 m^2 to the west, and 2,400 m^2 to the east of the existing A1 bridge crossing) which would be subject to vegetation removal during the construction period. This would be constrained by the need for offsets from above and below ground structures.							
Viewpoint 24: View looking south east from PRoW (115/009)	Construction – The awareness of the additional removal of existing woodland from the north side of the River Coquet valley at a distance of approximately 0-50 m, totalling 405 m^2 to the west, and 2,400 m^2 to the east of the existing A1 bridge crossing; – The presence of additional land stabilisation activity in	Magnitude of Impact	Major	Minor	No Change	Major	Moderate	Minor
High		Significance of effect	**Large Adverse**	**Moderate Adverse**	Neutral	**Large Adverse**	**Large Adverse**	Slight Adverse

Viewpoint Reference/ Sensitivity	Description of impact (in addition to those in Appendix 7.2 Viewpoints Visual Effects Schedule Part A [APP-217])		Environmental Statement Effects			Stabilisation Works (ES Addendum)		
			Construction	Operation Year 1	Operation Year 15	Construction	Operation Year 1	Operation Year 15
	close proximity, in the form of sheet piling, and associated plant, representing a larger working footprint (additional 2,805 m^2). Operation – Although partially obscured by the landform and lower slopes – there would likely remain awareness of the top of sheet piling on slopes below the viewpoint. – The partial re-planting of woodland within the areas (405 m^2 to the west, and 2,400 m^2 to the east of the existing A1 bridge crossing) which would be subject to vegetation removal during the construction period. This would be constrained by the need for offsets from above and below ground structures.							

Table C-2 - Residential Visual Effects Schedule – please refer to Appendix 7.3: Residential Visual Effects Schedule Part A [APP-218]

Viewpoint Reference/ Sensitivity	Description of impact (in addition to those in Appendix 7.3 Residential Visual Effects Schedule - Part A [APP-218])		Environmental Statement Effects (in addition to those in Appendix 7.3 Residential Visual Effects Schedule - Part A [APP-218])			Stabilisation Works (ES Addendum 2)		
			Construction	Operation Year 1	Operation Year 15	Construction	Operation Year 1	Operation Year 15
Receptor 27 (Helmspeth)	Construction:	Magnitude of Impact	Minor	Negligible	Negligible	Minor	Negligible	Negligible

Viewpoint Reference/ Sensitivity	Description of impact (in addition to those in Appendix 7.3 Residential Visual Effects Schedule - Part A [APP-218])		Environmental Statement Effects (in addition to those in Appendix 7.3 Residential Visual Effects Schedule - Part A [APP-218])			Stabilisation Works (ES Addendum 2)		
			Construction	Operation Year 1	Operation Year 15	Construction	Operation Year 1	Operation Year 15
High	– A marginal increase in the area impacted and of activity associated with the construction of the River Coquet bridge, beyond the existing woodland in the foreground, this would provide an effective screen to the majority of construction activity. Operation – Retaining sheet piling on the opposite side of the valley and areas of woodland that would not be replanted, and would be out of sight, set below the intervening tree line to the south of the River Coquet valley and intervening landform. – The partial re-planting of woodland within the areas (405 m^2 to the west, and 2,400 m^2 to the east of the existing A1 bridge crossing) would be imperceptible beyond the existing woodland in the middle distance and along the southern edge of	Significance of effect	Slight Adverse	Slight Adverse	Slight Adverse	Slight Adverse	Slight Adverse	Slight Adverse

Viewpoint Reference/ Sensitivity	Description of impact (in addition to those in Appendix 7.3 Residential Visual Effects Schedule - Part A [APP-218])		Environmental Statement Effects (in addition to those in Appendix 7.3 Residential Visual Effects Schedule - Part A [APP-218])			Stabilisation Works (ES Addendum 2)		
			Construction	Operation Year 1	Operation Year 15	Construction	Operation Year 1	Operation Year 15
	– the River Coquet valley. – Additional woodland planting as part of the Woodland Creation Area to the south of the River Coquet would be perceived, however this would substantially appear as an extension to existing woodland and tie into the woodland associated with the adjacent valley.							

Table C-3 - Public Rights of Way Visual Effects Schedule – please refer to Appendix 7.4: Public Rights of Way Visual Effects Schedule Part A [APP-219]

Viewpoint Reference/ Sensitivity	Description of impact (in addition to those in Appendix 7.4 Public Rights of Way Visual Effects Schedule Part A [APP-219])		Environmental Statement Effects (in addition to those in Appendix 7.4 Public Rights of Way Visual Effects Schedule Part A [APP-219])			Stabilisation Works (ES Addendum 2)		
			Construction	Operation Year 1	Operation Year 15	Construction	Operation Year 1	Operation Year 15
PRoW 422/020	Construction: – The awareness of the additional removal of existing woodland from the north side of the River Coquet valley at a distance of approximately 100-150 m, totalling 405 m^2 to the west, and 1,400 m^2 to the east of the existing A1 bridge crossing. – The presence of additional land stabilisation activity in the form of sheet piling, and associated plant, representing a larger	Magnitude of Impact	Minor	Minor	No Change	Minor	Minor	Minor
High		Significance of effect	**Moderate Adverse**	Slight Adverse	Neutral	**Moderate Adverse**	Slight Adverse	Slight Adverse

Viewpoint Reference/ Sensitivity	Description of impact (in addition to those in Appendix 7.4 Public Rights of Way Visual Effects Schedule Part A [APP-219])		Environmental Statement Effects (in addition to those in Appendix 7.4 Public Rights of Way Visual Effects Schedule Part A [APP-219])			Stabilisation Works (ES Addendum 2)		
			Construction	Operation Year 1	Operation Year 15	Construction	Operation Year 1	Operation Year 15
	working footprint (additional 2,805 m^2) within the previously assessed construction activity associated with the bridge supports and deck. Operation – Although greater appreciation of the river corridor would be experienced, there would be awareness at distance of retaining sheet piling on the opposite side of the valley and areas of woodland that would not be replanted, leaving open unwooded areas. – The partial re-planting of woodland within the areas (405 m^2 to the west, and 2,400 m^2 to the east of the existing A1 bridge crossing) which would be subject to vegetation removal during the construction period. This would be constrained by the need for offsets from above and below ground structures where planting cannot be established.							
PRoW 422/020	Construction – The awareness of the additional removal of existing woodland from the north side of the River Coquet valley at a distance of approximately 100-150 m, totalling 405 m^2 to the west, and 2,400 m^2 to the east of the existing A1 bridge crossing. – The presence of additional land stabilisation activity in the form of	Magnitude of Impact	Moderate	Minor	Minor	Moderate	Minor	Minor
High		Significance of effect	**Moderate Adverse**	Slight Beneficial	Slight Beneficial	**Moderate Adverse**	Slight Adverse	Slight Adverse

Viewpoint Reference/ Sensitivity	Description of impact (in addition to those in Appendix 7.4 Public Rights of Way Visual Effects Schedule Part A [APP-219])		Environmental Statement Effects (in addition to those in Appendix 7.4 Public Rights of Way Visual Effects Schedule Part A [APP-219])			Stabilisation Works (ES Addendum 2)		
			Construction	Operation Year 1	Operation Year 15	Construction	Operation Year 1	Operation Year 15
	sheet piling, and associated plant, representing a larger working footprint (additional 2,805 m^2) within the previously assessed construction activity associated with the bridge supports and deck. Operation – Although greater appreciation of the river corridor would be experienced, there would be awareness of retaining sheet piling on the opposite side of the valley and areas of woodland that would not be replanted, leaving open unwooded areas. – The partial re-planting of woodland within the areas (405 m^2 to the west, and 2,400 m^2 to the east of the existing A1 bridge crossing) which would be subject to vegetation removal during the construction period. This would be constrained by the need for offsets from above and below ground structures.							
St Oswalds Way	Construction – The awareness of the additional removal of existing woodland from the north side of the River Coquet valley at a distance of approximately 0-50 m, totalling 405 m^2 to the west, and 2,400 m^2 to the east of the existing A1 bridge crossing; – The presence of additional land stabilisation activity in close	Magnitude of Impact	Moderate	Minor	No Change	Major	Moderate	Minor
High		Significance of effect	**Large Adverse**	**Moderate Adverse**	Neutral	**Large Adverse**	**Large Adverse**	Slight Adverse

Viewpoint Reference/ Sensitivity	Description of impact (in addition to those in Appendix 7.4 Public Rights of Way Visual Effects Schedule Part A [APP-219])		Environmental Statement Effects (in addition to those in Appendix 7.4 Public Rights of Way Visual Effects Schedule Part A [APP-219])			Stabilisation Works (ES Addendum 2)		
			Construction	Operation Year 1	Operation Year 15	Construction	Operation Year 1	Operation Year 15
	proximity, in the form of sheet piling, and associated plant, representing a larger working footprint (additional 2,805 m^2). Operation – Although partially obscured by the landform and lower slopes – there would likely remain awareness of the top of sheet piling on slopes below the viewpoint. – The partial re-planting of woodland within the areas (405 m^2 to the west, and 2,400 m^2 to the east of the existing A1 bridge crossing) which would be subject to vegetation removal during the construction period. This would be constrained by the need for offsets from above and below ground structures.							

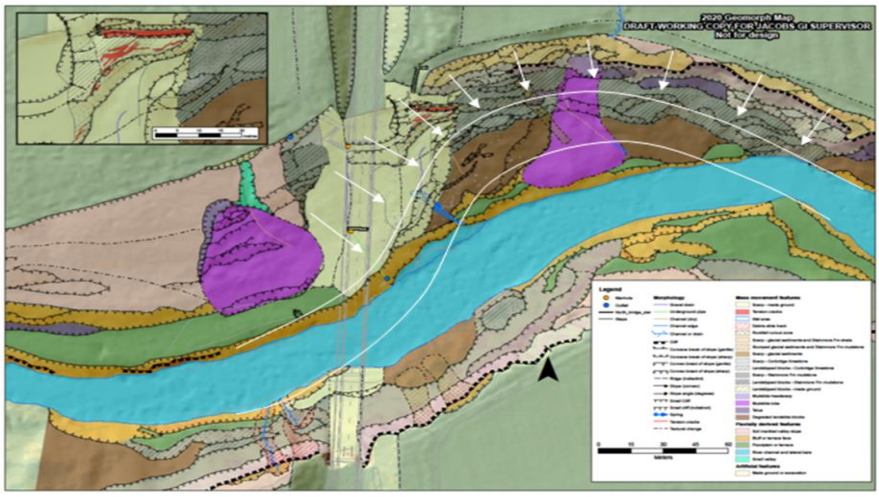
Appendix D

RIVER COQUET VALLEY SLOPE INSTABILITY

The review of the geological and geotechnical information, including the reporting of the ground investigation works undertaken between January and March 2020 and reported in July 2020, has confirmed that the north slope of the River Coquet Valley is suffering from instability. Without treatment this could cause a failure in the slope during the construction and operation of the new bridge and could also have a detrimental impact on the existing bridge structure.

It is clear from the geomorphological features present (refer to Figure D-1) that the Site and the area immediately to the east are affected by historical landslide movement.

Figure D-1 - Geomorphological Mapping

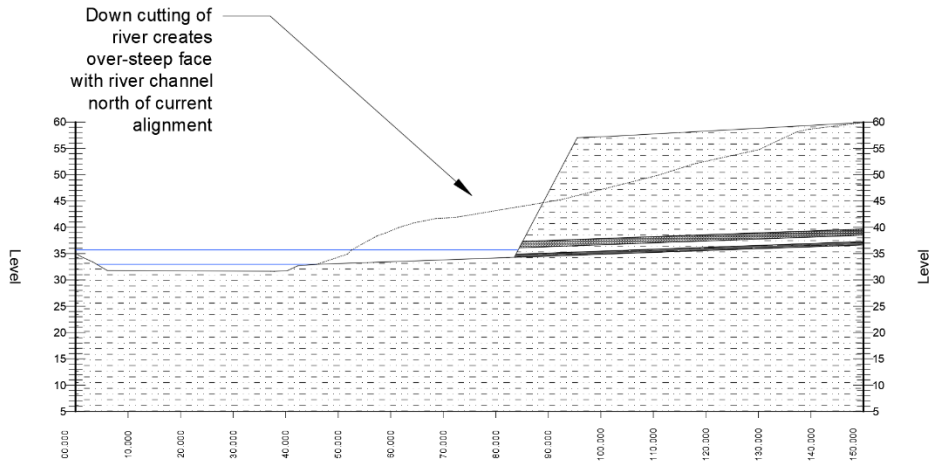


The updated ground model is interpreted to have resulted from the following stages of geomorphological development of the northern valley slope:

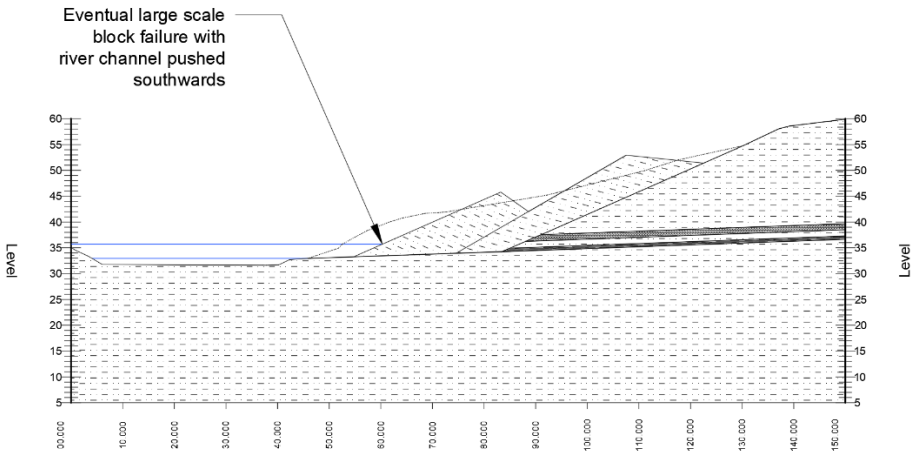
- Down cutting of the river valley to current levels resulting in an over-steepened slope with the river channel north of its current alignment.
- Eventual large-scale block failure with release along weaker planes.
- Eventual relaxation of slope angles to achieve a quasi-stable state.
- Ongoing toe erosion and potential changes in groundwater triggering gradual ongoing instability.

This is illustrated below:

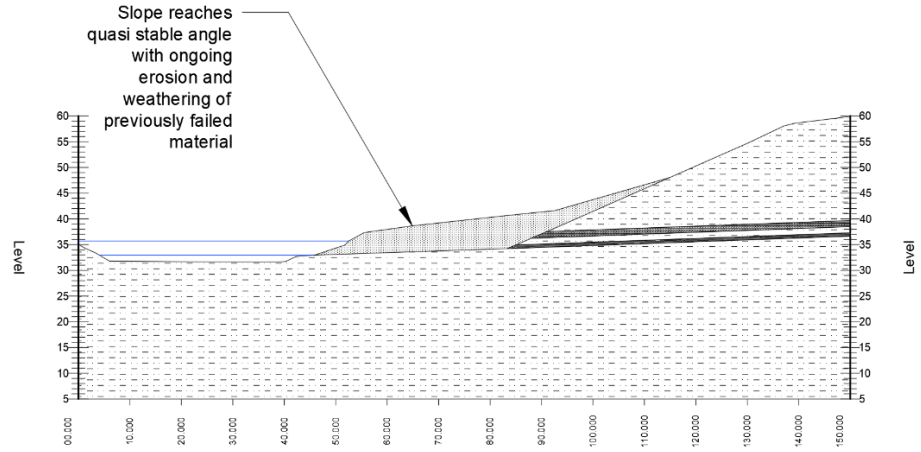
Step 1



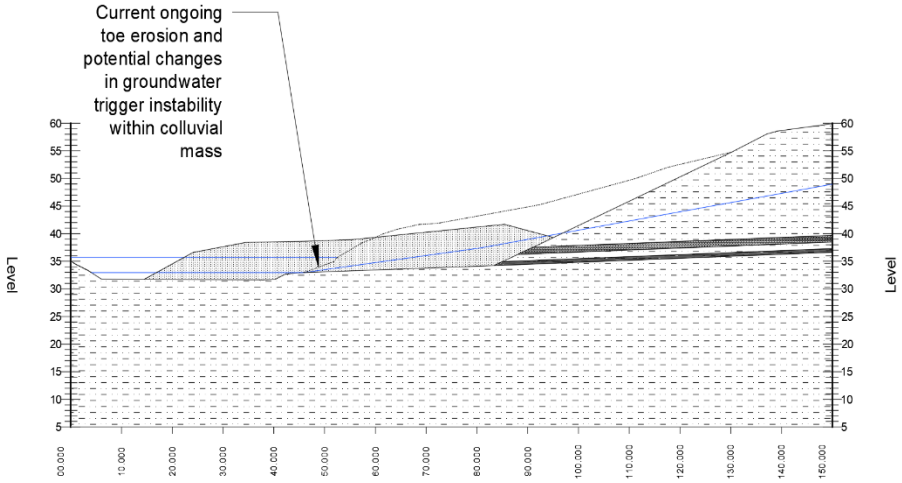
Step 2



Step 3



Step 4



The interpretation supports there having been a more sinuous river alignment in the geological past which would match that required to have triggered the large-scale land sliding observed to the east of the bridge location. Extrapolating the conjectured channel upstream also supports the interpretation that the same mechanism and land sliding has taken place at the proposed bridge location. The river is now in a phase of secondary readjustment and is gradually eroding the northern bank and migrating northwards towards its former alignment.

The revised assessment considers the updated ground model and conjectured cause of land sliding and applies 'moderately cautious' material parameters rather than 'worst credible' parameters that were adopted previously to reflect the limited Ground Investigation information available at the time.

The revised analyse is considered to provide a credible initial basis from which to consider the general form and magnitude of the remedial works.

Drawing upon the revised analyses, the following failure modes are now considered unlikely and have therefore been discounted:

- Shallow failure within Made Ground.
- Deep seated failure within Bedrock.

Excluding the area immediately east and south-east of the existing bridge abutment, the risk of significant instability of the Made Ground within the area of the proposed pier foundation is considered to be low. This is supported by the revised slope stability analyses (Factor of Safety greater than 1.3) and previous site observations which do not indicate significant instability of the Made Ground present within this area of the valley slope.

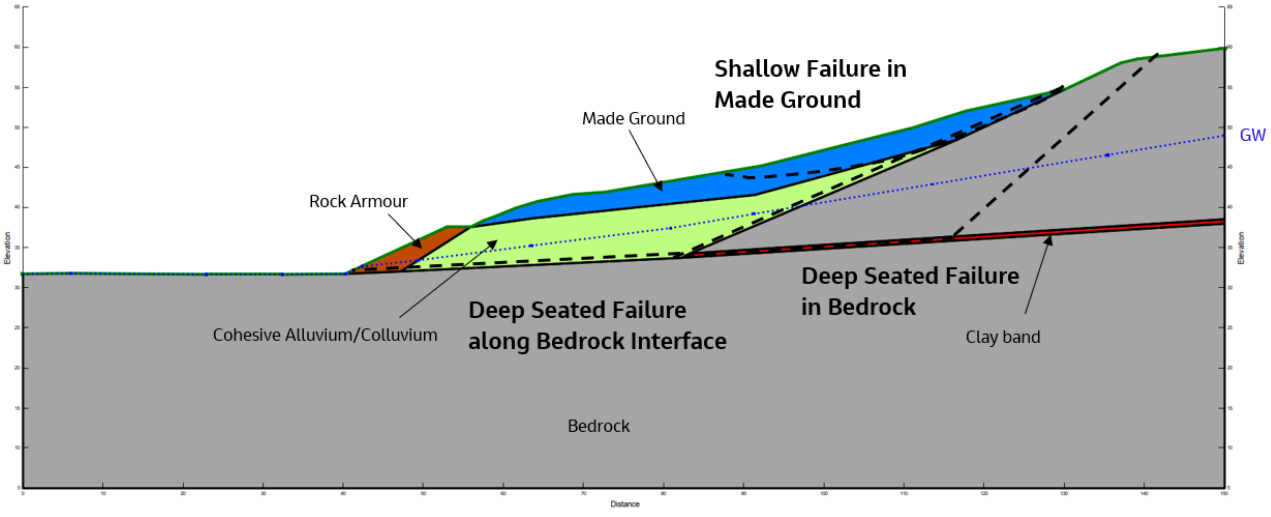
Reflecting the revised ground model and interpreted cause of land sliding, a deep-seated failure within the intact bedrock is considered to have a low probability. This is supported by revised slope stability analyses for this theoretical failure mechanism.

A failure mechanism coinciding with bedrock at the base of the Alluvial / Colluvial deposits remains credible and this is supported by the updated slope stability analyses.

Assuming the presence of a pre-existing failure surface at the base of Alluvial / Colluvial deposits due to former slope movement the adoption of residual shear strength parameters is valid. With this assumption applied, the slope is indicated to be marginally stable with a level of stability below what is considered appropriate given the consequence of failure.

The updated ground model including the above described failure modes (including those now discounted) are indicated in Figure D-2.

Figure D-2 - Assumed Ground Model - Failure Surfaces



A number of options have been considered to address the instability and a number of piling configurations have been considered. The proposed solution comprises spaced, bored piles, ensuring the stability of the northern valley sides and allowing the new pier foundation

to be installed. This is considered to be the best solution given the slope failure mechanism and depth of failure surface.

The influence of stabilising piles has been assessed in accordance with Viggiani, C. (1981) Ultimate Lateral Loads on Piles Used to Stabilize Landslides. Proc 10th Int Conf. Soil Mech. Foundn. Engng., Stockholm, Vol3, pp 555-560.

A row of piles is necessary at the toe of the slope as part of erosion protection measures in combination with scour protection along the river's edge along the north bank and to prevent loss of down slope support to the pier foundation.

Appendix E

REGISTER OF ENVIRONMENTAL ACTIONS AND COMMITMENTS

APPENDIX E: REGISTER OF ENVIRONMENTAL ACTIONS AND COMMITMENTS

The mitigation measures detailed in **Outline CEMP** [**REP3-013 and 014**] still apply for the Stabilisation Works. **Table E-1** details those measures that are additional or require amendment to those shown in the **Outline CEMP** [**REP3-013 and 014**] for the Stabilisation Works. If the Stabilisation Works are accepted by the Planning Inspectorate and Secretary of State for Transport, then the measures in **Table E-1** will be incorporated into the Outline CEMP.

Table E-1 - Additional Mitigation Measures for the Register of Environmental Actions and Commitments

Ref	Action (Including Monitoring Requirements)	Objective	Source Reference	Organisation / Individual Delivering Measure	Achievement Criteria and Reporting Requirements (Reported on the Requirements Register published on the Applicant's Scheme website)	Project Phase (Design, Pre-Construction, Construction, Operation)	Record of Completion (Signature and Date)
General							
SW-G1	Following completion of construction of the scour protection, the main contractor will be responsible for defects over a set period (generally 12 months). After this period the scour protection will be adopted by the Applicant and fall within their routine schedule of maintenance and inspections. Towards the end of the construction period the CEMP will be developed as a Handover Environmental Management Plan (HEMP) which will include the monitoring and management arrangements of the scour protection going forward during future maintenance and operation. The indicative contents of a HEMP are detailed in Annex C of IAN 183/14.	To ensure the continued maintenance of the revised Scheme once operational.	**Paragraph 2.7.2** of this ES Addendum	The main contractor, or the Applicant, or Northumberland County Council	CEMP approved by the Secretary of State following consultation with NCC as per Requirement 5, Schedule 2 of the **draft DCO** [**REP3-004 and 005**] HEMP	Construction Operation	
Landscape and Visual							
SW-L1	During the construction phase, the following additional mitigation measures will be included: – The partial re-planting of woodland within the areas (405 m^2 to the west, and 2,400 m^2 to the east of the existing A1 bridge crossing) which will be subject to vegetation removal during the construction period. This will be constrained by the need for offsets from above and below ground structures meaning that not all existing woodland planting will be replaced; and – The planting of an additional 3.1 hectares of woodland (compensatory habitat), to replace 0.28 hectares of broadleaved woodland lost within the Coquet River Felton Park LWS, to be	To reduce the impact of construction on local landscape and visual receptors.	**Paragraph 6.9.2** of this ES Addendum	Main contractor	CEMP approved by the SoS following consultation with NCC as per Requirement 4, Schedule 2 of the **draft DCO** [**REP3-004 and 005**] Site Environmental Inspection Reports Landscape design discharged as required by the DCO	Construction	

Ref	Action (Including Monitoring Requirements)	Objective	Source Reference	Organisation / Individual Delivering Measure	Achievement Criteria and Reporting Requirements (Reported on the Requirements Register published on the Applicant's Scheme website)	Project Phase (Design, Pre-Construction, Construction, Operation)	Record of Completion (Signature and Date)
	provided in addition to the Woodland Creation Area set out in the revised Ancient Woodland Strategy Part A for Change Request (submitted at Deadline 4). The additional planting would be located to the south of the existing ancient woodland to the south of the River Coquet as shown in in Figure 2: Location Plan and Compensatory Habitat Location in Appendix A of this ES Addendum. This will require additional permanent land-take.						
Biodiversity							
SW-B1	The temporary river training measures and permanent scour protection will be constructed using suitable materials to avoid changes in water chemistry, such as the use of washed stone or inert materials.	To manage risk to ecology associated with the design of changes to/new structures within watercourses.	**Paragraph 8.9.2** of this ES Addendum	Designer Main contractor	CEMP approved by the Secretary of State following consultation with NCC as per Requirement 4, Schedule 2 of the **draft DCO** [**REP3-004 and 005**] As built drawings	Design	
SW-B2	Following the removal of the temporary river training measures, the riverbed will be restored to a pre-works comparable condition.	To manage risk to ecology associated with the design of changes to/new structures within watercourses.	**Paragraph 8.9.6** of this ES Addendum	Designer Main contractor	CEMP approved by the Secretary of State following consultation with NCC as per Requirement 4, Schedule 2 of the **draft DCO** [**REP3-004 and 005**] As built drawings	Construction	
SW-B3	The temporary loss of woodland to the west of the carriageway would be incorporated into the future great crested newt European Protected Species (EPS) licence application (as detailed in measure A-B22 of the **Outline CEMP [REP3-013 and -014]** and as updated at Deadline 4). The future licence application would be issued to Natural England prior to construction. The additional area to the west of the carriageway would be	To comply with conservation legislation, protect GCN habitat and prevent an impact to the Favourable Conservation Status	**Paragraph 8.9.10** of this ES Addendum	Designer Named Ecologist (main contractor) ECoW (main contractor)	CEMP approved by the Secretary of State following consultation with NCC as per Requirement 4, Schedule 2 of the **draft DCO** [**REP3-004 and 005**]	Pre-Construction Construction	

Ref	Action (Including Monitoring Requirements)	Objective	Source Reference	Organisation / Individual Delivering Measure	Achievement Criteria and Reporting Requirements (Reported on the Requirements Register published on the Applicant's Scheme website)	Project Phase (Design, Pre-Construction, Construction, Operation)	Record of Completion (Signature and Date)
	included within the area enclosed by amphibian exclusion fencing. This would be followed by a capture and translocation period, to move newts out of the works area prior to site clearance and construction. Following construction, the woodland would be reinstated (temporary loss of habitat).	of the local GCN population.			Protected species license as authorised by Natural England As built drawings EPS Method Statements Landscape design discharged as required by the DCO		
SW-B4	The permanent scour protection will be designed to be in keeping with existing natural rocky areas of the River Coquet. Whilst the scour protection will result in the permanent loss of natural riverbank habitat, the design of the scour protection will provide suitable sheltering habitat for aquatic invertebrates and juvenile fish and will naturally become vegetated over time.	To manage risk to ecology associated with the design of changes to/new structures within watercourses.	**Paragraph 8.9.7** of this ES Addendum	Designer Main contractor	As built drawings	Design Construction	
SW-B5	An assessment of the biological water quality and water chemistry will be undertaken prior to and during construction to monitor the river during the Stabilisation Works. The main contractor will monitor and take appropriate action if water quality deteriorates, following agreement with Natural England and the Environment Agency where required (for example where a permit or licence is in place with conditions/restrictions). The monitoring will assess pH, suspended solids, Biochemical Oxygen Demand (BOD) and Chemical Oxygen Demand (COD). The methodology of the monitoring will be determined at detailed design and captured within a monitoring and management strategy for the Stabilisation Works.	To reduce or prevent the impact of the Stabilisation Works.	**Paragraph 8.9.4** of this ES Addendum	ECoW	Water Quality Monitoring and Management Strategy	Construction	
SW-B6	To address the loss of woodland within the Coquet River Felton Park LWS, adopted as ancient woodland for the purposes of mitigation, the areas of additional permanent land take to facilitate the compensatory habitat have been incorporated into revised **Ancient Woodland Strategy Part A for Change Request** (submitted at Deadline 4). In addition to the measures	To address the loss of woodland within the Coquet River Felton Park LWS	**Paragraph 8.9.8** of this ES Addendum	Main contractor with guidance from the Arboriculturalist (main contractor), Environmental Manager (main	Ancient Woodland Strategy As Built drawings Landscape Design Certificate	Construction Operation	

Ref	Action (Including Monitoring Requirements)	Objective	Source Reference	Organisation / Individual Delivering Measure	Achievement Criteria and Reporting Requirements (Reported on the Requirements Register published on the Applicant's Scheme website)	Project Phase (Design, Pre-Construction, Construction, Operation)	Record of Completion (Signature and Date)
	detailed within the former **Ancient Woodland Strategy Part A** [**APP-247**], the following measures have been included in the revised **Ancient Woodland Strategy Part A for Change Request** (submitted at Deadline 4): – Planting will be undertaken in line with the approach outlined in the revised Ancient Woodland Strategy Part A for Change Request (submitted at Deadline 4); – There would be site-specific sampling for the additional land to determine soil pH and nutrient status, which would be used to inform soil preparation post-construction prior to planting (see item b below); – The additional land take (0.28 ha) would be replanted as broadleaved, semi-natural woodland, using native species of local provenance, in keeping with the retained surrounding woodland (referred to as the "Replanted Area" within the revised Ancient Woodland Strategy Part A for Change Request submitted at Deadline 4); – An additional area of approximately 3.1 ha of compensatory woodland habitat will be created, an expansion to the Woodland Creation Area located to the south-west of the existing River Coquet Bridge (as detailed in the revised Ancient Woodland Strategy Part A [APP-247] for Change Request (submitted at Deadline 4).In combination with the replanting of the 0.28 ha of land to the north of the River Coquet, the proposed woodland creation equates to a ratio of approximately 1:12 (loss:creation); and – Monitoring and maintenance of the associated replanted and created woodland as part of the revised Ancient Woodland Strategy Part A for Change Request (submitted at Deadline 4).			contractor) and ECoW (main contractor)	Arboricultural Method Statement Landscape design discharged as required by the DCO		
SW-B7	A management and monitoring strategy for the proposed scour protection of the northern riverbank will be	To monitor the impact of the revised Scheme	**Paragraph 8.9.11** of	The Applicant	HEMP	Operation	

Ref	Action (Including Monitoring Requirements)	Objective	Source Reference	Organisation / Individual Delivering Measure	Achievement Criteria and Reporting Requirements (Reported on the Requirements Register published on the Applicant's Scheme website)	Project Phase (Design, Pre-Construction, Construction, Operation)	Record of Completion (Signature and Date)
	developed at detailed design in consultation with Natural England and the Environment Agency. The strategy will include, but not limited to, inspections of the scour protection at an appropriate frequency throughout its lifespan to monitor the structural condition and conduct repairs/replacement where necessary. Any repair or replacement works will be subject to the same construction mitigation detailed within **Section 9.9**, **Chapter 9: Biodiversity Part A** of the ES [**APP-048**] and this ES Addendum.	on biological water quality during operation.	this ES Addendum				
SW-B8	An assessment of the biological water quality and water chemistry will be undertaken post-construction to monitor water conditions within the River Coquet. The results of the monitoring will be compared against baseline data collected prior to and during construction. If required, remedial actions will be implemented following consultation and agreement with Natural England and the Environment Agency.	To monitor the impact of the revised Scheme on biological water quality during operation.	**Paragraph 8.9.12** of this ES Addendum	The Applicant	HEMP	Operation	
Road Drainage and the Water Environment							
SW-W1	Drainage arrangements will be designed to prevent build-up of groundwater behind the installed piles, if necessary.	To minimise the impacts of the north bank stabilisation piles.	**Table 9-6** of this ES Addendum	Designer Main Contractor Environmental Manager (main contractor)	CEMP approved by the Secretary of State following consultation with NCC as per Requirement 4, Schedule 2 of the **draft DCO** [**REP3-004 and 005**] As built drawings	Design	
SW-W2	The detailed design stage will seek to minimise the extent of hard engineered erosion protection required and consider the use of sympathetic materials and construction techniques likely to provide increased roughness and improve riparian structure (such as vegetated rock armour).	To minimise the impacts of the north bank stabilisation piles.	**Paragraph 9.10.32** of this ES Addendum	Designer Main Contractor	CEMP approved by the Secretary of State following consultation with NCC as per Requirement 4, Schedule 2 of the **draft DCO** [**REP3-004 and 005**] As built drawings	Design	

Ref	Action (Including Monitoring Requirements)	Objective	Source Reference	Organisation / Individual Delivering Measure	Achievement Criteria and Reporting Requirements (Reported on the Requirements Register published on the Applicant's Scheme website)	Project Phase (Design, Pre-Construction, Construction, Operation)	Record of Completion (Signature and Date)
SW-W3	The following design measures associated with the Stabilisation Works including erosion protection will include the following: – Construct erosion protection to reflect the natural bank profile. – Minimise the extent of hard engineered erosion protection. – Use sympathetic materials and construction techniques, likely to replicate existing bank roughness. Likely measures to be refined during detailed design. – Re-plant the reinstated made ground, using a locally appropriate tree, shrub and seed mix. Apply seeded biodegradable geotextile if outside of growing season, to reduce likelihood of erosion following reinstatement during out-of-bank flows. – A total of 24 m of bank impacted by construction activities, and lying outside of the proposed permanent scour protection is proposed to be reinstated (where possible) using green or green-grey erosion control methods set out in HR Wallingford (2017)[15] and planted to allow recovery of the riparian vegetation structure. – Reinstate bed substrate to a pre-works comparable condition.	To minimise the impacts of the Stabilisation Works including erosion protection.	**Table 9-6** of this ES Addendum	Designer Main Contractor Environmental Manager (main contractor)	CEMP approved by the Secretary of State following consultation with NCC as per Requirement 4, Schedule 2 of the **draft DCO** [**REP3-004 and 005**] As built drawings	Design	
SW-W4	The following additional measures will be implemented during the construction of the lower north bank piling platform and associated works, including temporary retaining wall / river training works:	To reduce the impact of the construction of the lower north bank piling platform and associated works,	**Table 9-5** of this ES Addendum	Main contractor Environmental Manager (main contractor) (with Geomorphological	CEMP approved by the SoS following consultation with NCC Scheme design drawings	Pre-Construction Construction	

[15] HR Wallingford (2017) Green approaches in river engineering, Supporting implementation of green infrastructure.

Ref	Action (Including Monitoring Requirements)	Objective	Source Reference	Organisation / Individual Delivering Measure	Achievement Criteria and Reporting Requirements (Reported on the Requirements Register published on the Applicant's Scheme website)	Project Phase (Design, Pre-Construction, Construction, Operation)	Record of Completion (Signature and Date)
	– Near and in-channel works will be anticipated to be around 16 months. – Bank and bed features (outside the extent of permanent works) as far as practicable to be reinstated to existing profiles following completion of the permanent works. – Prior to construction, any sedimentary bed features that may be will be mapped and photographed, and boulders (>0.5 m) will be surveyed, numbered and marked to show orientation relative to the channel bed. At onset of the construction phase, these sediments will be removed and stored. Upon completion of construction, the sedimentary bed features will be reinstated where practicable, with boulders placed according to the surveyed data. – River training walls to be lined with geotextile to prevent release of construction aggregate associated with the piling platform, to the channel.	including temporary retaining wall / river training works on the River Coquet.		Specialist support)			
SW-W5	The following additional measures will be implemented during the construction of the Stabilisation Works: – The duration of the construction impacts of the Stabilisation Works will be anticipated to be around 16 months for near-channel and in-channel works. Following this period, bank and bed features which will not be replaced by permanent infrastructure (see SW-W1 and SW-W2 of this REAC), will be reinstated as close as possible to their original form. – Sediment barriers (i.e. silt fences) will be installed at regular intervals following slope contours. The silt fences will be placed at regular intervals between the slope crest and foot to reduce the silt accumulation burden placed on silt fence. Silt fences and/or other edge protection measures will be installed along the River Coquet bank to reduce the risk	To reduce the impact of the Stabilisation Works on the River Coquet.	**Paragraph 9.9.3** and **Table 9-5** of this ES Addendum **Paragraph 8.8.3** of this ES Addendum	Main contractor Environmental Manager (main contractor) (with Geomorphological Specialist support)	CEMP approved by the SoS following consultation with NCC Scheme design drawings	Construction	

Ref	Action (Including Monitoring Requirements)	Objective	Source Reference	Organisation / Individual Delivering Measure	Achievement Criteria and Reporting Requirements (Reported on the Requirements Register published on the Applicant's Scheme website)	Project Phase (Design, Pre-Construction, Construction, Operation)	Record of Completion (Signature and Date)
	of increased sedimentation entering the channel during construction. A site specific drainage management plan will be created to attenuate, treat and discharge site runoff. – Due consideration of the drainage requirements will be given to collect, attenuate, treat and discharge any groundwater seepage that may occur due to cuts into the slope. – Suitable surface material will be used on haul roads to reduce structural damage from vehicular movements and exposure of bare ground which will be susceptible to surface water runoff.						
SW-W6	The following additional measures will be implemented during the construction of the Stabilisation Works: – Deploy in-channel silt barriers (i.e. silt curtains or similar) as far as reasonably practical or a similar form of barrier if silt water runoff is discharging into the River Coquet to control the downstream dispersion of suspended solids. – Install a suitable geomembrane between the river training works and piling platform to minimise the release of construction aggregate associated with the piling platform. – During periods of heavy rain, adopt regular visual inspections of the watercourse to identify discharges of silt laden runoff and take immediate action if required.	To reduce the impact of the Stabilisation Works on the River Coquet.	**Table 9-5** of this ES Addendum **Paragraph 8.9.3** of this ES Addendum	Main contractor Environmental Manager (main contractor) (with Geomorphological Specialist support)	CEMP approved by the SoS following consultation with NCC Scheme design drawings	Construction	
SW-W7	During construction, visual survey of the bed and banks will be undertaken to understand the degree and nature of change following any high flow events during construction to verify the findings of the assessment set out in this ES Addendum.	To manage risks to the water environment (pollution risks).	**Paragraph 9.11.1** of this ES Addendum	Main contractor Environmental Manager (main contractor)	CEMP approved by the SoS following consultation with NCC as per Requirement 4, Schedule 2 of the **draft DCO** [**REP3-004 and 005**]	Construction	

Ref	Action (Including Monitoring Requirements)	Objective	Source Reference	Organisation / Individual Delivering Measure	Achievement Criteria and Reporting Requirements (Reported on the Requirements Register published on the Applicant's Scheme website)	Project Phase (Design, Pre-Construction, Construction, Operation)	Record of Completion (Signature and Date)
					Signed toolbox talk records Water Quality Monitoring and Management Strategy		
Geology and Soils							
SW-GS1	Slope stability monitoring instrumentation in the form of Shape Accel-Arrays was installed as part of the recent ground investigation. This will be used during construction to monitor ground movement and hence minimise the impact of the slope instability on construction.	To monitor ground movement during construction.	**Paragraph 10.9.2** of this ES Addendum	Main contractor Environmental Manager (main contractor)	CEMP approved by the Secretary of State following consultation with NCC as per Requirement 4, Schedule 2 of the **draft DCO** [**REP3-004 and 005**] Environmental Inspection Records		
Population and Health							
SW-PH1	Pursuant to the Compensation Code, compensation for additional permanent land take for compensatory habitat will be agreed with West Moor Farm whose land will be permanently acquired to accommodate the compensatory habitat.	To reduce temporary construction effects on Agricultural Land.	**Paragraph 11.9.2** of this ES Addendum	The Applicant Main contractor	CEMP approved by the SoS following consultation with NCC Soil Management Strategy	Construction	
Materials and Waste							
SW-M1	Where site-won material meets re-use criteria (as described in **paragraph 12.10.6** and **12.10.7** of this ES Addendum), it will be retained within the revised Scheme for use within, for example, footway and bridleway construction, or surfacing materials.	In order to increase resource efficiency.	**Paragraph 12.9.2** of this ES Addendum	Main contractor Environmental Manager (main contractor) Environmental Consultant (designer)	CEMP approved by the SoS following consultation with NCC MMP	Construction	

Appendix F

PRELIMINARY SCOUR ASSESSMENT

Technical Note

Project: A1 IN NORTHUMBERLAND

Date: 12/03/2021

River Coquet - Preliminary Fluvial Scour Risk Assessment

1. INTRODUCTION

1.1 DMRB guidance CD 356 Design of Highway Structures for Hydraulic Action (CD 356) is applicable to all new structures in, or over rivers, estuaries and floodplains and includes the design of scour protection measures and other river training works for both temporary and permanent works. This applies to the River Coquet underbridge which is both over and has temporary and permanent structural elements within the channel confines.

1.2 The CD356 design procedure details the following stages:

1) establishment of design principles;
2) determination of design criteria;
3) assessment of scour risk;
4) design of scour protection, where required;
5) calculation of hydraulic actions and checks of the structure under the effect of these actions; and
6) design of specific elements of the structure.

1.3 It should be noted that the design process is currently at a Preliminary Stage 3 (Assessment of Scour Risk) and is an iterative process, as the structural design develops and influences the risk of scour and the design of the scour protection system. This has provided sufficient information for the purposes of EIA and submission of the Change Request. Design continues to iterate including 2-Dimensional (2-D) hydraulic modelling, which will provide improved determination of design criteria and allow confirmation of scour risk and then inform subsequent design stages.

1.4 This preliminary fluvial scour risk assessment ("preliminary assessment") reports the predicted total scour depth associated with the proposed River Coquet road bridge with consideration of scour at the following two locations:

- Rock revetment (north bank)
- Southern bridge pier (south bank)

2. METHODOLOGY

2.1 This preliminary assessment has been undertaken in accordance with the requirements presented in DMRB CD356 'Design of Highways Structures for Hydraulic Action' and the supporting methodologies presented in CIRIA C742 'Manual on Scour at Bridges and other Hydraulic Structures' and Hydraulic Engineering Circular No18 'Evaluating Scour at Bridges'.

2.2 The assessment is also based on the results following a preliminary hydraulic assessment for scour examining distributed design flows and velocities within the river corridor and is summarised below in Section 3.1. As detailed above, computational numerical modelling of the River Coquet at the proposed bridge location is required to improve the determination of design criteria and hence this preliminary assessment will be reviewed and updated with the numerical modelling results. The updated assessment will be made available at Deadline 8 of the Examination.

2.3 The scour assessment has considered the following design flood event and two 'check' events as required by DMRB.

Design Event	0.5% AEP (200-year) plus 50% allowance for climate change (200yr + 50%)[1]
Check Events	0.5% AEP (200-year) plus 65% allowance for climate change (200yr + 65%)
	0.1% AEP (1000-year) plus 50% allowance for climate change (1000yr + 50%)

2.4 For each flood event, the preliminary assessment has calculated a total scour depth at key locations of interest to the design of the new bridge, which are: at the toe of the north bank, for consideration of the stability of the left hand bank which provides support to the north pier and north abutment of the bridge; and around the base of the south pier which is located within the flood extents on the south bank adjacent to the main channel.

2.5 At each location of interest, the total scour depth is the combination of contraction scour and local scour effects. Contraction scour is caused by the reduction in river cross-section available to the flow which, in this case, arises from the introduction of the new bridge, whereas local scour is caused by individual artificial elements within the flow such as the southern pier or a riverbank revetment.

2.6 The design impacts of the predicted scour depths are then assessed by considering both the susceptibility of the proposed structural design to scour, and any relevant geotechnical information such as predicted bedrock levels. If bedrock is present at a

[1] The Environmental Statement uses the 1% AEP plus a 50% allowance for climate change, whereas CD356 directs the designer to this higher magnitude event.

shallow depth, may limit the scour depths which would be achieved in practice to a smaller value than calculated.

3. RESULTS

Hydraulic Assessment for scour

3.1 The hydraulic assessment for scour is based on the results of a simplified hydraulic assessment of flow distribution within the river corridor. Manning's equation was used to investigate and compare the distribution of flows between the river channel and left- and right- hand inset floodplains for both the existing baseline condition and the proposed condition with the new bridge in place. Given that the combination of the existing and proposed new bridge piers at an angle to the river will reduce the ability of the right hand floodplain to convey flow, but the degree of blockage was unable to be confirmed at the time of assessment, a conservative assumption was made that no flow could pass via the right hand floodplain.

3.2 The predicted distribution of flows used in the scour assessment is summarised in Table 1, below, which shows the increase in flows carried by the main channel and left hand floodplain as a result of the loss of conveyance on the right hand floodplain.

Table 1: Distribution of flows in baseline and proposed conditions

	Baseline Condition Flows (m^3/s)			Proposed Condition Flows (m^3/s)		
Flow event	LH floodplain	Main channel	RH floodplain	LH floodplain	Main channel	RH floodplain
200yr+50%	4.5	557.1	117.6	12.4	666.8	0.0
200yr+65%	8.3	606.4	132.5	20.2	727.0	0.0
1000yr+50%	13.1	653.2	146.8	29.2	783.9	0.0

Contraction Scour

3.3 Contraction scour is associated with the loss of cross-sectional area due to the proposed bridge features. As described above, this has been simplified to assume that the right inset floodplain is 'blocked' by the existing pier and the proposed pier comprised in Work No. 4 as detailed hydraulic information is not available on the flood mechanism around the pier. This leads to precautionary values for contraction scour as the flow is focused in the central portion of the channel.

3.4 Predicted contraction scour depths are presented in Table 2.

Table 2: Predicted Contraction Scour Depth

Design/check event	Predicted Contraction scour depth
200yr+50%	0.36m
200yr+65%	0.39m
1000yr+50%	0.41m

Predicted Local scour at North bank (left bank)

3.5 The stabilisation of the north valley side is required to avoid potential excessive loading of the proposed northern pier foundation together with the loss of down slope support and lateral restraint to the foundation. To prevent failure of the valley side and to provide support to the north bridge pier, it is proposed to install a line of semi-continuous non-interlocking bored concrete piles (contiguous bored pile wall) close to the river bank. On the river side of these piles it is proposed to install a rock revetment system, to support and offer protection to the piles and prevent the loss of material from between individual piles. This rock revetment system would form the north river bank at this location.

3.6 Consideration has been given to the predicted scour depth i.e. contraction scour in the main channel and local scour associated with the revetment. Predicted contraction scour in the main channel is presented in Table 2.

3.7 Predicted local scour associated with the proposed revetment is presented in Table 3.

Table 1: Predicted local scour depths at revetment toe

Design/Check event	Predicted Local scour depth (Revetment)
200yr+50%	1.5m
200yr+65%	1.6m
1000yr+50%	1.7m

3.8 Taking the most onerous design condition i.e. 1.7m and adding the predicted contraction scour yields a predicted total scour depth at this location of circa 2.1m. This is measured from existing river bed level, and hence it is recommended that the toe of the rock revetement is appropriately designed to safely accommodate a scour depth of 2.1m, notwithstanding the presence of competent bedrock which may limit the scour depth. As bedrock is at 31-32mAOD, the rock revetment would be appropriately 'keyed' into the bedrock at its toe. This would require a channel to be cut into the bedrock to improve the stability of the rocks at the toe of the revetment and prevent failure.

3.9 Based on the preliminary hydraulic assessment for scour and estimated flow velocities, it is proposed that that rock revetment comprises a rock size (dn_{50}) of between 0.8m and 1m. The system shall be two rock layers thick, overlying an

appropriate geotextile filter and with a 1:2 profile. A steeper profile up to 1:1.5 may be possible, but this may require a larger rock size.

3.10 The extent of the rock revetment will extend beyond the end of the proposed pile wall allowing for a taper into the existing river bank and is detailed in Figure 1: Stabilisation Works in Appendix A: Figures of the ES Addendum.

Predicted Local scour at South Pier (right bank)

3.11 Local scour at a bridge pier is a function of the shape of the pier (width and length), depth of water, velocity and flow direction relative to the principal pier axis.

3.12 For the purposes of this preliminary assessment, it is assumed that the existing and proposed piers are largely acting independently of each other, given the space between them, and the risk of debris being trapped and forming a blockage between the piers has not been included. The flow angle relative to the pier axis is considered to range between 15° and 30° as currently this is subjective based on the hydraulic assessment for scour. At this stage no factor of safety has been included as the scour depth is already predicted to be close to the bed rock plane and therefore is limited to this depth.

3.13 The predicted local scour depth associated with the southern pier is presented in Table 4.

Table 4: Predicted local scour and depths at southern pier

Design/check event	Predicted local Scour depth (Pier)	
	15° attack angle	30° attack angle
200yr+50%	2.92m	3.76m
200yr+65%	3.47m	4.47m
1000yr+50%	3.85m	4.96m

3.14 The predicted local scour depth range at the southern pier is between *circa* 3m and 5m. Including the predicted contraction scour from Table 2, the total predicted scour depth range at the southern pier is between *circa* 3.3m and 5.4m. Note that this does not include a factor of safety.

3.15 The southern pier is proposed to be supported by a piled foundation with the top of the pile cap at a level of 36.0mAOD, hence the predicted scour depth level measured from here is between 32.7mAOD and 30.6mAOD. This is close to the level of the existing river bed and anticipated bedrock level, which is at around 31.0 - 32.0mAOD. Given the location of the proposed pier at the right hand river bank, it is very likely

that the combination of contraction scour and local scour would result in the loss of the natural river bank at this location.

3.16 DMRB CD356 suggests that the pile cap should be placed below total scour depth or where this is not the case, piles should be designed as columns with reduced lateral restraint and/or reduced skin friction due to the loss of surrounding material.

Pier foundation solutions

3.17 A free-standing pile is not considered as an acceptable solution both aesthetically and from optimal engineering solution. There are three solutions for the pier foundation – 1) offer a conventional scour protection measure to prevent the loss of material surrounding the pier foundations, 2) place the pile cap below the total predicted scour depth, or 3) install an embedded wall in the river bank between the channel and required pier foundation in conjunction with surface protection to the area surrounding the pier.

3.18 Due to the proximity of the proposed pier to the existing river bank and the extension of the existing river training works 12m into the area of the new pier, there is limited space for a conventional scour protection system such as a rock revetment without this projecting into the main channel (see Photograph 1). This would reduce channel capacity, exacerbate contraction scour and possibly deflect energy downstream. To make space for a rock revetment would likely require relocating the bridge pier away from the river bank, which at this stage is assumed to be unacceptable due to the impacts that this would have on hydromorphology and sediment behaviour.

Photograph 1: South pier looking upstream to river training works and position of the new pier

3.19 The second option is to place the pile cap below the predicted total scour depth. This would require the top of the pile cap to be set at 30.6mAOD which as noted previously is expected to approximately coincide with bedrock level. To cast a pile cap at this level would require a temporary excavation up to 7.4m deep. This poses challenges with constructability and safety and increased risk of inundation from the river. There

is also the potential for disturbance to aquatic organisms due the nature of the required excavation into the bedrock.

3.20 The third option would require a line of continuous interlocking bored concrete piles (secant bored pile wall) to be installed along the crest of the existing river bank with the pile cap retained at the currently proposed higher level. The piles within the river bank would prevent scour beneath the foundation but the piles would be exposed if scour of the river bank did take place. The piles would need to extend up- and down-stream of the proposed foundation and to be tied into to scour protection to the existing pier foundation. This option is considered to be more practical than placing the pile cap at depth and is therefore the recommended solution as works would be less susceptible from flooding from the river, and has a lesser potential for disturbance to aquatic organisms.

3.21 To construct the proposed southern pier, a working platform is proposed immediately downstream of the pier. This would require 'cut' into the valley side resulting in a steep sided profile which would also extend beneath the proposed bridge. This would be reinstated following construction. The reinstated slope will be subject to inundation during flood events and potential for erosion. As noted previously this may result in unacceptable instability of the valley slope; therefore, it is recommended that the toe of the slope is offered protection against fluvial erosion. The nature of the scour protection system at this location would be subject to the nature and profile of the engineered slope and available space and be comprised of either a reno mattress and gabions or a rock armour solution to the 0.1%AEP plus 50% flood level of 38.86mAOD .

3.22 The viable pier foundation options would be considered in subsequent design development and in relation to complimentary scour protection systems. The current proposed scour protection system is considered a worst plausible case and is detailed in Figure 1: Stabilisation Works in Appendix A: Figures of the ES Addendum.

4. CONCLUSION / FUTURE WORK

4.1 This preliminary assessment has detailed the scour risk to the north and south bank features of the River Coquet crossing using the guidance set out in CD356. This has concluded that the north bank and south bank require scour protection systems and the extents are detailed in Figure 1: Stabilisation Works in Appendix A: Figures of the ES Addendum.

4.2 This comprises a hard engineered 'grey' solution in closer proximity to the structure in the form of rock armour moving to a green-grey solution for the reinstated banks outside the zone of protection required for the bridge foundations. Green-grey solutions are a hybrid of engineered and biodegradable / vegetated solutions that are considered more environmentally sensitive but have a greater resistance to scour than green solutions like wood revetment or biodegradable vegetated matting. These grey-green solutions will be considered further during the design development process.

4.3 As detailed above further assessment work is proposed to further define the design criteria, particularly the hydraulic conditions and as described above a 2-D hydraulic model will be used to inform the scour design process. The structural pier foundation design and the scour protection design will be refined and presented at Deadline 8.

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