

A1 in Northumberland: Morpeth to Ellingham

Scheme Number: TR010059

6.44 Water Framework Directive Addendum for Change Request

Rule 8(1)(c)

Planning Act 2008

Infrastructure Planning (Examination Procedure) Rules 2010

Infrastructure Planning

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**The Infrastructure Planning
(Examination Procedure) Rules
2010**

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

Water Framework Directive Addendum for Change Request

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1. WATER FRAMEWORK DIRECTIVE (WFD) COMPLIANCE ADDENDUM

1.1. INTRODUCTION

- 1.1.1. This assessment has been prepared as an addendum (“Addendum”) to a previous compliance assessment contained in **Appendix 10.2: Water Framework Directive Assessment Part A** of the Environmental Statement (ES) [APP-255] (“WFD Assessment”). This Addendum supports a request to amend an application for development consent [REP3-004 and 005]. Details of the change request are set out in section 2 of this Addendum.

1.2. PROJECT OVERVIEW

- 1.2.1. An application for development consent [REP3-004 and 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”).
- 1.2.2. 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.
- 1.2.3. The application was accepted for Examination on 4 August 2020.
- 1.2.4. 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.
- 1.2.5. This Addendum presents an assessment of the potential impacts associated with the proposed changes to the Scheme on both the surface and groundwater bodies designated within this site. It is not a duplication of the WFD Assessment, submitted with the application for development consent [REP3-004 and 005], and should be read in conjunction with the WFD Assessment.

1.3. LEGISLATIVE PURPOSE OF THE REPORT

- 1.3.1. The Water Framework Directive (WFD) needs to be taken into account in the planning of all new activities in the water environment. The Directive has been transposed into English and Welsh legislation as The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017. An explanation of the WFD is provided in **Section 1.4** of the WFD Assessment.

2. SCHEME DESCRIPTION

2.1. PROPOSED CHANGES TO THE SCHEME

- 2.1.1. 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. The two proposed changes to the Scheme in the vicinity of the River Coquet are the Stabilisation Works and Southern Access Works, as described in **Environmental Statement Addendum: Stabilisation Works for Change Request** and **Appendix B: Summary of Proposed Changes to the Application** of the **Environmental Statement Addendum: Southern Access Works for Change Request**. Further details are provided in the sections below.
- 2.1.2. The revised **General Arrangement Plans** for the proposed changes to the Scheme (submitted at Deadline 4 of the Examination) illustrate the main components of the Scheme including these design changes.

2.2. STABILISATION WORKS

- 2.2.1. The Stabilisation Works would take place on the northern side of the River Coquet. They 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 the **Environmental Statement Addendum: Stabilisation Works for Change Request**. All the piles would be concrete and approximately 600 mm in diameter and indicatively 14 m in length. 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.
- 2.2.2. Due to insufficient space for safe access for construction plant within the existing Order limits, this requires additional temporary and permanent land in order to ensure that the Stabilisation Works can be undertaken and maintained, 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 the **Environmental Statement Addendum: Stabilisation Works for Change Request**.
- 2.2.3. The additional land required outside 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 the **Environmental Statement Addendum: Stabilisation Works for Change Request**. 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 relatively 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.

NORTH BANK ROCK ARMOUR

- 2.2.4. A requirement has been identified to protect the bridge foundations from hydraulic action and 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 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.
- 2.2.5. The form and dimensions of this protection are subject to on-going engineering assessment and design, however for assessment purposes, the following has been assumed as a reasonable worst case:
- a. The scour protection solution assumed for assessment purposes is a rock armour revetment which maintains the existing channel cross section profile and extends for along the left river bank, downstream of the existing bridge crossing. The footprint and position of the scour protection are shown on **Figure 1: Southern Access Works Proposals in Appendix A: Figures of the Environmental Statement Addendum: Southern Access Works for Change Request.**
 - b. Based on the preliminary hydraulic assessment for scour and estimated flow velocities, a rock revetment comprising a rock size (dn50) of between 0.8 m and 1 m is required. 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.
- 2.2.6. This protects the bridge foundation and also prevents scour from outflanking the revetment through erosion of the banks in the downstream reach. The location of the scour protection is shown on **Figure 1: Stabilisation Works in Appendix A: Figures of the Environmental Statement Addendum: Stabilisation Works for Change Request .**
- 2.2.7. 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 the Environmental Statement Addendum: Stabilisation Works for Change Request.**
- 2.2.8. The Stabilisation Works would involve the creation of a dry area to allow reparation of the river's bed to accept river training works. The location of the temporary training works are shown on **Figure 1: Stabilisation Works in Appendix A: Figures of the Environmental Statement Addendum: Stabilisation Works for Change Request.** 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).

2.2.9. Further details of the Stabilisation Works are provided in **Chapter 2: Stabilisation Works of Environmental Statement Addendum: Stabilisation Works for Change Request** .

SOUTHERN PIER ROCK ARMOUR

2.2.10. An extension of the proposed permanent scour protection around the southern bridge pier is required to protect the bridge foundations from hydraulic action and maintain the integrity of the proposed design. The form and dimensions of this protection are subject to on-going engineering assessment and design, however for assessment purposes, the following has been assumed as a reasonable worst case:

- a. Form of protection: a combination of rock armour, and/or reno mattress and green-grey bank protection
- b. Dimensions: the footprint and position of the scour protection are shown on **Figure 1: Southern Access Works Proposals in Appendix A: Figures of the Environmental Statement Addendum: Southern Access Works for Change Request**. The extension of the proposed scour protection will impact a maximum of 45 m of river bank (with 28 m as rock armour and 17 m as green-grey bank protection), in addition to the river bank affected by the scour protection described in **Chapter 2: The Scheme of the ES [APP-037]**.

2.3. SOUTHERN ACCESS WORKS

2.3.1. It is proposed that the temporary access to the southern bank of the River Coquet would be via a temporary bridge (Bailey Bridge) to be constructed in the location shown on **Figure 1: Southern Access Works Proposals in Appendix A: Figures of the Environmental Statement Addendum: Southern Access Works for Change Request**.

2.3.2. The sections below provide a summary of the Southern Access Works with further details provided in **Chapter 2: Southern Access Works of Environmental Statement Addendum: Southern Access Works for Change Request**.

TEMPORARY BRIDGE

A series of 8 no. manhole rings (4.8 m high; 1.8 m internal diameter) filled with approximately 98 m³ of concrete or stone would be placed in the riverbank on each side of the river to act as foundation supports for the temporary bridge. Initial access to the south bank for machinery/equipment would either be via crane or tracking across the riverbed.

2.3.3. The temporary bridge would have a span of 50 m and weigh approximately 130 tonnes and would comprise a steel open lattice type structure which would be delivered to the north bank of the River Coquet and assembled adjacent to the river, before being lifted into position using a 750 tonne crane situated on the north bank. The bridge deck would be set at 38.0 mAOD, this is above the 1% Annual Exceedance Probability (AEP) (100-year) flood level of 36.27 m AOD.

TEMPORARY RIVER TRAINING WORKS

- 2.3.4. A series of concrete Legato blocks (~~or similar to be confirmed during detailed design~~) founded on a gabion mattress would be installed in the river, around the south bank temporary working area, to act as a temporary retaining wall. This wall will be 68 m long and be aligned such that 47 m will lie within the river channel, with the remaining length either just outside the channel or at the eastern extent of the wall, returned into the bank/hillside.

2.4. STUDY AREA

- 2.4.1. The Study Area for the Addendum has been extended to reflect the extent of the Stabilisation Works and Southern Access Works. This encompasses water features 0.5 km from the Stabilisation Works and Southern Access Works and features that are in hydraulic connectivity with the works area in the Order limits, however this does not change the features that were previously assessed in the WFD Assessment.

3. ASSESSMENT METHODOLOGY

3.1. OUTLINE

- 3.1.1. In order to support a WFD compliance assessment submitted under the Planning Act 2008, the process has been broken down into a series of clearly defined steps, to provide a transparent and accountable assessment of the Stabilisation Works and Southern Access Works. The following steps have been considered:
- a. Scoping: through baseline data collection and identification of water body elements at water body scale.
 - b. Screening: identifies the scheme elements to be assessed in the impact assessment.
 - c. Impact Assessment: considers the potential impacts of an activity to a water body element, identifies ways to avoid or minimise impacts, and indicates if an activity may cause deterioration or jeopardise the water body achieving GES or GEP.
 - d. Assessment of the proposed scheme against water body measures.
 - e. Cumulative impact assessment of the proposed scheme in conjunction with other proposed schemes planned or in place on the water body.
 - f. Assessment of the proposed scheme against overarching WFD objectives.
 - g. Article 4.7 test: if the Scheme is predicted to cause deterioration in water body status or prevent the water body from meeting its objectives, then assessment is also made against the conditions listed in Article 4.7.
- 3.1.2. In addition, information has been taken from data collated during site visits undertaken 26 January and 26 February 2021. Information from this has been used to corroborate the impact assessment provided here.
- 3.1.3. The site visits observed morphological features, channel and bank forms, and identified geomorphic process and processes and flow types were mapped and a geolocated photographic record captured. The presence and extent of existing modifications were also mapped, which included the existing A1 bridge pier, river training works, drainage outfall and estimated extent of construction works area from the existing bridge.
- 3.1.4. The geomorphological assessment also draws upon the results from calculated hydraulic parameters (from hydraulic modelling) including water level, velocity, stream power and shear stress and used to assess potential changes in sediment transport, erosion and deposition.

4. COMPLIANCE ASSESSMENT

4.1. BASELINE DATA COLLECTION

- 4.1.1. Data from the Environment Agency's Catchment Data Explorer website <https://environment.data.gov.uk/catchment-planning/> have been used to support the compliance assessment.
- 4.1.2. Changes to baseline conditions relevant to the Stabilisation Works and Southern Access Works since WFD Assessment are discussed below. The remainder of the text within the WFD Assessment as relevant to the Stabilisation Works and Southern Access Works remains unchanged and valid.

4.2. BASELINE SCOPING

- 4.2.1. The following water bodies are in the scope of this assessment:
- a. Coquet from Forest Burn to Tidal Limit freshwater WFD water body (the water body directly relevant to the scheme) (**Table 1**); and
 - b. Northumberland Carboniferous Limestone and Coal Measures groundwater body relevant to the scheme (**Table 2**).
- 4.2.2. The upstream water body is the Coquet from Holystone Burn to Forest Burn (GB103022076692). The downstream water body is the Coquet transitional water body (GB510302203000). Both of these are scoped out of further assessment due to distance away from the Scheme's location. It is not thought that any impacts for the Scheme would affect either of these.

Table 1 - Baseline description of biological, physico-chemical and hydromorphological quality elements for the Coquet from Forest Burn to Tidal Limit water body. Source: Environment Agency Catchment Explorer Classifications from cycle 2 2019 data

Water body ID	GB103022076693
Water body name	Coquet from Forest Burn to Tidal Limit
NGR	NU2335705298
Length (km)	31.241
Catchment area (km ²)	65.602
Catchment area (ha)	6560.19
Hydromorphological designation	Not designated artificial or heavily modified

Water body ID	GB103022076693
Current overall status	Moderate with objective to reach Good by 2015
Reasons for not achieving good status	No data to show
Protected area designation	Coquet from Forest Burn to Tidal Limit. UKGB103022076693. Drinking Water Protected Area SWSGZ6012. Safeguard Zone
Current ecological status (and status objective)	Good (Good by 2015)
Biological quality elements	Good. Good by 2015 Macrophytes and phytobenthos combined: Good Invertebrates: High
Hydromorphological supporting elements	Supports Good Hydrological Regime: High
Physico-chemical quality elements	Good. <ul style="list-style-type: none"> · Acid neutralising capacity: High · Ammonia (phys-chem): High · Biological Oxygen Demand: High · Dissolved Oxygen: High · pH: High · Phosphate: High · Temperature: Good
Chemical quality elements	Fail (Good by 2027)

- 4.2.3. General measures proposed for the Coquet from Forest Burn to Tidal Limit WFD water body are for the removal or easement of barriers to fish migration, with specific reference also made to preventing eels and elvers from being entrained (sucked into) river abstractions and prevented from returning upstream by obstructions.

- 4.2.4. Other general measures applied to the wider Northumbria River Basin District are stated to include reducing point source and diffuse pollution from wastewater discharge, agricultural runoff and urban runoff; reducing the impact of manmade structures of wildlife in watercourses and improving hydromorphological conditions; and improving longitudinal connectivity and removing barriers to fish migration.

Table 2 - Baseline description of groundwater quality elements for Northumberland Carboniferous Limestone and Coal Measures water body. Source: Environment Agency Catchment Explorer Classifications from cycle 2 2019 data

Water body ID	GB40302G700200
Water body name	Northumberland Carboniferous Limestone and Coal Measures
NGR	NU1310040912
Surface area (km ²)	1822.741
Groundwater area (ha)	182274.064
Current overall status	Poor
Status objective (overall)	Poor by 2015
Reasons for not achieving good status:	Abandoned mine. Chemical Dependent Surface Water Body Status
Protected area designation	Berwick Fell. G97. Nitrates Directive Northumberland Carboniferous Limestone and Coal Measures. UKGB40302G700200. Drinking Water Protected Area
Quantitative Status	Good. Good by 2015
Chemical Status	Poor. Poor by 2015

- 4.2.5. In addition to the WFD-specific baseline, the following outlines catchment baseline data (note the catchment area is not the same as the WFD water body). Further reference should be made to the WFD assessment.

CATCHMENT OVERVIEW

- 4.2.6. The River Coquet rises at Coquet Head within the Cheviot Hills, in Northumberland National Park at 440 m AOD, which is approximately 40 km to the north-west of the existing A1 alignment. The catchment is characterised by a steep, deep valley with land use dominated by agricultural, woodland and upland vegetation with a number of small rural communities. Urban land use occupies less than 1 % of the catchment with grassland being the dominant land use. The catchment area is approximately 486 km².
- 4.2.7. Within the Study Area, the River Coquet flows under the existing A1 bridge and flows in a predominantly south-west to north-east direction. It discharges into the North Sea approximately 17 km downstream of the bridge by the town of Amble. The River Coquet is classified as a main river and under the jurisdiction of the Environment Agency. The study reach lies within a deep v-shaped valley, with heavily vegetated steep slopes with managed coniferous and deciduous woodland on the northern face and ancient woodland dominating the southern face (Dukes Bank Wood).
- 4.2.8. Within the upper catchment of the River Coquet, the solid geology is dominated by low permeability bedrock; moderate permeability bedrock is more prevalent in the lower reaches of the catchment. Mixed permeable deposits dominate the superficial geology. Low permeability bedrock affects the flood hydrograph, which reflects the response of a river to rainfall. Thus, low permeability results in faster rising water levels following rainfall in the catchment. The River Coquet, consequently, has a flashy hydrological regime with the river typically rising and falling within a four-hour period following rainfall.
- 4.2.9. The soils are dominated by Cambisols with a soil texture of predominantly clay to sandy loam and are cohesive. Thus, the soils are resistant to fluvial erosion processes.

Historical Channel Changes

- 4.2.10. Analysis of historical maps dating back to the 1860s indicates that the alignment of the River Coquet has not changed or has been modified. The river valley shows characteristic signs of post-glacial adjustment following the Pleistocene glaciation, with distinct terrace formations and the channel being bound by the deep-cut valley with bedrock controls. During the post-World War II period, the mapping record reveals a reduction in woodland cover on the valley sides. Legacy industrial activities within the catchment include mills, which were powered by the river.

Contemporary Channel Characteristics

- 4.2.11. The River Coquet flows beneath the existing A1 bridge alignment within Dukes Bank Wood. Figure 1 below shows a photograph of the bridge facing downstream. The as-built drawing for the bridge has been included in **Figure 10.2: River Coquet Bridge As-Built Drawing Part A** of the ES [APP-112].



Figure 1 - River Coquet Bridge, Looking Downstream

- 4.2.12. For further information regarding fish population refer to **Chapter 9: Biodiversity Part A** of the ES[**APP-048**].
- 4.2.13. Data obtained from the Environment Agency during consultation returned the following records of fish:
- a. Atlantic salmon
 - b. Brown/sea trout
 - c. European eel
 - d. Stone loach
 - e. Minnow
 - f. Three-spined stickleback.
- 4.2.14. Atlantic salmon, brown/sea trout and European eel are all protected species listed under Section 41 of the NERC Act 2006 and are of principal importance. Brown trout and European eel are also listed in the Northumberland Local Biodiversity Action Plan (LBAP).

4.3. SCREENING

- 4.3.1. This section details a site-specific assessment of the Stabilisation Works and Southern Access Works contained in the Change Request against quality elements for biology, physico-chemical and hydromorphological elements for the water bodies affected by the Scheme. Only the water body elements considered to be impacted are considered in the assessment.
- 4.3.2. For the purposes of this assessment, the construction activities to be assessed as part of the stabilisation works (construction) are piling; access road and piling mat/cut and fill; scour protection; and creation of dry area for temporary training works.
- 4.3.3. The activities assessed for the southern access works are the construction of the temporary bridge and abutments; river training works (legato blocks); and southern pier rock armour. Reinstatement works are also included. These are covered in both construction and operation as the temporary works have an operational phase.

4.4. SITE-SPECIFIC IMPACT ASSESSMENT

- 4.4.1. Potential impacts are presented below (**Tables 3 and 4**) for WFD quality elements of the River Coquet that may be impacted by the proposed Stabilisation Works and Southern Access Works only. **Table 5** presents the potential impacts to the groundwater body as a result of operation.
- 4.4.2. Potential impacts for all other Scheme works and water environment receptors, have been detailed within the WFD Assessment remain unchanged and valid. Whilst there are cumulative impacts likely, components only specific to the change request are included here.
- 4.4.3. The following tables present impacts for both construction and operational phases **Tables 3 and 4**. For clarity, the temporary works are also classed as operational for the purposes of this assessment, as they will be operating as a structure within the water body for the duration of the construction works.

Table 3 - Construction impacts assessment for Scheme

Element	Indicator	Potential Impact on Receptor from construction of activities outlined in Section 2	Proposal (Including Mitigation)	Detrimental Impact or Change to WFD Status	Compliant with WFD Objectives
Biological	Fish Invertebrates Macrophytes	<p>Construction activities, such as noise and vibration may impact on fish migration.</p> <p>Suspended solids, vegetation clearance and construction activities may result in the input of fine sediment into the channel. The potential for spillages may also cause pollution of the watercourse with detrimental impacts on the aquatic ecology.</p>	<p>Prior to construction, an Outline CEMP [REP3-013 and 014] as updated at Deadline 4 would be produced by the main contractor to manage environmental impacts during construction. The CEMP would set out how construction activities would be undertaken in accordance with appropriate good practice guidance, such as CIRIA's control of water pollution from construction sites (C532) (Ref. 10.2.33). Although withdrawn, the Pollution Prevention Guidelines (PPG) (Ref. 10.2.34) published by the Environment Agency still provide good practice guidance, particularly PPG1 - General guide to the prevention of water pollution, PPG 5 - Works in, near or liable to affect watercourses and PPG 6 - Working at construction and demolition sites.</p> <p>Measures that should be outlined in the Outline CEMP [REP3-013 and 014] as updated at Deadline 4 for managing risks to the water environment should include the following:</p> <ul style="list-style-type: none"> - Locating topsoil stores and construction compounds away from the banks of watercourses. - Covering and or seeding topsoil stores to further prevent sediment entering the watercourses during periods of heavy rainfall. - All loose materials would be covered so as not to increase sediment load to the drainage network. - Dewatering watercourses to maintain a dry construction area and passing any water generated by the dewatering process through silt busters or sediment tanks prior to returning this water to the watercourses. 	<p>Some increase in sedimentation is likely to occur due to the proximity of the works to the river channel and works required within the river channel. The impact is not considered to pose a risk of failing current WFD status or preventing watercourse from meeting future WFD objectives.</p>	Yes

Element	Indicator	Potential Impact on Receptor from construction of activities outlined in Section 2	Proposal (Including Mitigation)	Detrimental Impact or Change to WFD Status	Compliant with WFD Objectives
			<p>The Outline CEMP [REP3-013 and 014] as updated at Deadline 4 would contain an ecological mitigation strategy to identify measures to mitigate the impact on ecological assets and a strategy of pollution prevention, which would include details of fuel storage, spillage management, disposal of contaminated drainage and measures for highlighting pollution prevention awareness within the workforce.</p> <p>Where notable or protected aquatic species have been identified in the ES chapters, it is proposed to carry out fish rescues prior to commencing any construction. Further information regarding this can be found in Chapter 9: Biodiversity, Part A of the ES [APP-048].</p>		
Hydromorphology	<p>Quantity and dynamics of flow</p> <p>River continuity</p> <p>River depth and width variation</p> <p>Structure and substrate of the river bed</p> <p>Structure of the riparian zone</p>	<p>Increased flow velocities, stream power and discharge during construction, with the potential to alter the sediment transport capability of the river.</p> <p>Disturbance to fish migrations due to noise and vibration.</p> <p>Localised alteration to the cross-sectional area and channel depth within the construction zone, with potential associated impacts on flow velocities, stream power and sediment transport capability.</p> <p>Potential for fine sediment input, altering the structure and substrate mix of the river bed.</p> <p>Potential for larger particles sizes to become mobilised under high flows during construction. However, mobilisation of the</p>	<p>Mitigation, both embedded into design and included within the Outline CEMP [REP3-013 and 014] as updated at Deadline 4 , would be implemented to minimise and, where practicable, eliminate impacts.</p> <p>In river works would not occur during high flows.</p> <p>Vegetation clearance would be minimised as far as practicable.</p> <p>Reinstate vegetation, with an appropriate native species mix, as soon as practicable.</p>	<p>The impact is not considered to pose a risk of failing current WFD status or preventing watercourse from meeting future WFD objectives.</p>	<p>Yes</p>

Element	Indicator	Potential Impact on Receptor from construction of activities outlined in Section 2	Proposal (Including Mitigation)	Detrimental Impact or Change to WFD Status	Compliant with WFD Objectives
		<p>large substrate fractions is only likely during extreme events.</p> <p>Loss of riparian habitat due to vegetation clearance within the construction zone.</p> <p>Consequential impacts on reduced roughness, increased flow velocity, stream power, and the ability for the river to erode and transport sediment.</p>			
Physico-chemical / specific pollutants	Acid neutralising capacity Ammonia BOD Dissolved oxygen pH Phosphate Temperature Copper Zinc	<p>Increase in concentration of elements due to accidental spillage of materials during construction or contaminants in site surface water discharge during construction.</p> <p>Increase in sediment-laden runoff with the potential to increase BOD, reduce dissolved oxygen, change pH and elevate phosphates.</p>	<p>All site works and ground works would be undertaken in accordance with the Outline CEMP [REP3-013 and 014] as updated at Deadline 4 to ensure the risk of contamination during construction is mitigated. Measures that should be included in the Outline CEMP [REP3-013 and 014] as updated at Deadline 4 for managing risks to the water environment should include consideration to the following:</p> <ul style="list-style-type: none"> - Management of surface water runoff to intercept and, where necessary, treat runoff to prevent the migration of pollutants to receiving water features. - Management of polluting substances that are being brought on site and used as part of the construction process. <p>Similar mitigation to that discussed above for the control of increased sedimentation to ensure that flow would be maintained along the watercourses as discussed above which would assist in the dispersion of pollution.</p>	<p>Some increase in pollution is likely to occur due to the proximity of the works to the river channels and works required within the river channels. Given the low sensitivity of the majority of watercourses to pollution and the fact that a lot of the watercourses receive runoff from adjacent agricultural land that is likely to introduce sediment laden runoff with high organic loading, the impact is not considered to pose a risk of failing current WFD status or preventing watercourses from meeting future WFD objectives.</p>	Yes
Priority substances / C pollutants / iority hazardous substances	Lead Nickel Cadmium	<p>Increase in concentration of elements due to accidental spillage of materials during construction or contaminants in site surface water discharge during construction.</p>	<p>All site works and ground works would be undertaken in accordance with the Outline CEMP [REP3-013 and 014] as updated at Deadline 4 to ensure the risk of contamination during construction is mitigated. Measures that should be included in the Outline CEMP [REP3-013 and 014] as updated at Deadline 4 for managing risks</p>	None predicted	Yes

Element	Indicator	Potential Impact on Receptor from construction of activities outlined in Section 2	Proposal (Including Mitigation)	Detrimental Impact or Change to WFD Status	Compliant with WFD Objectives
			<p>to the water environment should include consideration to the following:</p> <ul style="list-style-type: none"> - Management of surface water runoff to intercept and, where necessary, treat runoff to prevent the migration of pollutants to receiving water features. - Management of polluting substances that are being brought on site and used as part of the construction process. 		

Table 4 - Operational impacts assessment for Scheme

Element	Indicator	Potential Impact on Receptor from operation of activities outlined in Section 2 (including temporary works)	Proposal (Including Mitigation)	Detrimental Impact or Change to WFD Status	Compliant with WFD Objectives
Biological	Fish Invertebrates Macrophytes	Fine sediment input could continue to have detrimental impacts without appropriate mitigation and potential increase in turbidity and smother bed substrates.	Vegetation would be reinstated as soon as practicable post-construction. Once vegetation is established, fine sediment inputs would reduce to baseline conditions, or near to baseline conditions.	None predicted.	Yes
Hydromorphology	Quantity and dynamics of flow River depth and width variation Structure and substrate of the river bed Structure of the riparian zone	<p>Locally constrained channel due to river training during high flows</p> <p>Continued fine sediment input due to exposed bare earth on the valley sides.</p> <p>Loss of the riparian zone within the area cleared.</p>	<p>Vegetation would be reinstated as soon as practicable post-construction. Once vegetation is established, fine sediment inputs would reduce to baseline conditions, or near to baseline conditions.</p> <p>The riparian zone would be reinstated with a structure to resemble the baseline.</p> <p>Made-ground would comprise an appropriate mix of cohesive material, capped with a compacted angular mix of gravels to small cobbles with a minimum intermediate axis of 40 mm.</p>	None predicted	Yes
Physico-chemical / specific pollutants	Acid neutralising capacity Ammonia BOD	Potential sediment remobilisation during the operational phase of the temporary works resulting in potential deterioration of nutrient conditions within the water course if there is a direct pathway for transport to the river	There would be no short term or long-term impacts on the water quality.	None predicted	Yes

Element	Indicator	Potential Impact on Receptor from operation of activities outlined in Section 2 (including temporary works)	Proposal (Including Mitigation)	Detrimental Impact or Change to WFD Status	Compliant with WFD Objectives
	Dissolved oxygen pH Phosphate Temperature Copper Zinc	channel, and therefore potential deterioration. Source of sediment is likely to be from the erodible made-ground. Fines likely to settle in margins and be re-suspended during higher flows. Overall potential impacts are likely to be temporary and local. Site lies within an agricultural catchment. Potential disturbance of substrate could promote legacy release of nutrients within the soil, particularly nitrates and phosphates. Most likely to be diluted but still a temporary and localised risk.			
Priority substances / Other pollutants / Priority hazardous substances	Lead Nickel Cadmium	No impact likely.	N/A	N/A	N/A

Table 5 - Groundwater operation impact assessment

Element	Receptor	Potential Impact on Receptor from operation of activities outlined in Section 2	Proposal (Including Mitigation)	Detrimental Impact or Change to WFD Status	Compliant with WFD Objectives
Quantitative elements	Impact on dependent surface water bodies. Water balance	Proposals outlined in section 2 would not involve any significant changes in land use when considered in the context of the wider catchment area and, therefore, would not impact on groundwater recharge or water balance and the overall quantitative elements.	None	None predicted	Yes

Element	Receptor	Potential Impact on Receptor from operation of activities outlined in Section 2	Proposal (Including Mitigation)	Detrimental Impact or Change to WFD Status	Compliant with WFD Objectives
Chemical elements	Drinking water protected area. General chemical test. Impact on surface waters.	Due to the relatively localised scale of the proposed works, no alteration in the regional groundwater quality due to contaminants in site surface water discharge or accidental spillages of materials during construction is expected.	All site works and ground works would be undertaken in accordance with the Outline CEMP [REP3-013 and 014] as updated at Deadline 4 to ensure the risk of contamination during construction is mitigated. The surface water drainage strategy does not include discharging to ground and the grassed detention basins would be lined.	None predicted	Yes

4.5. ASSESSMENT AGAINST WFD MITIGATION MEASURES

- 4.5.1. Within each published RBMP, there is a list of mitigation measures, or environmental improvements, which have been identified by the RBMP, which need to be implemented in order to improve the ecology of water bodies by a specified date in order for the UK to meet the target date set by the Water Framework Directive. Those that did not achieve the 2015 target will have had an extension until either 2021 or 2027.
- 4.5.2. Part of the compliance assessment is to consider mitigation measures and assess whether a proposed Scheme can contribute to them or might obstruct any of them from being delivered.
- 4.5.3. For the Coquet, the EA's data catchment explorer site states that there are no measures within this operational catchment which the predicted improvements in the status of water bodies by 2021 are based upon. Other measures may be taking place, (which there are, as shown in **Table 6**) but there is not enough confidence (in location or scale of improvement) to predict specific outcomes based upon them (According to the website). A summary of these measures is outlined below in **Table 6**.

Table 6 - Measures occurring within the water body (Source: EA Catchment data explorer)

River Basin District	Link to RBMP Part 1	Measure category 1	Measure category 2	Measure category 3
Northumbria	Water industry investment programme	To improve modified habitat	Removal or easement of barriers to fish migration	Manage risk of fish entrainment
Northumbria	Water industry investment programme	To improve modified habitat	Removal or easement of barriers to fish migration	Manage risk of fish entrainment

- 4.5.4. From the above, it can be concluded that the proposed scheme would not contribute to these measures but also does not impede or obstruct their future delivery. As stated above, there are no measures within the operational catchment. The other measures (**Table 6**) are for water industry investment programmes. The measure is to improve habitat, remove barriers to fish passage and manage risk of entrainment (which is usually incidental to water industry installations). The Scheme is not impeding fish passage (there are no cross-channel structures such as weirs being proposed, for example) but is also not removing barriers to migration upstream either.

4.6. ARTICLE 4.7 TEST

4.6.1. Any works undertaken must not cause deterioration in overall water body status; nor must they prevent water bodies from achieving their WFD objectives (Section 4.5). If this is not possible, the works would need to satisfy an exemption test under Article 4.7 of the Water Framework Directive. The exemption test and the requirements for it are determined by the Environment Agency. It is concluded that the works will not cause deterioration, and wider water body objectives will not be compromised.

4.7. MAINTENANCE OF NON-HEAVILY MODIFIED WATER BODY STATUS

4.7.1. Under Article 4.3 of the Directive, water bodies may be designated as artificial (AWB) or heavily modified (HMWB) in the River Basin Management Plans. Under the legislation there is recognition that some water bodies have been significantly physically modified to support various uses which provide valuable social and economic benefits. In many cases these modifications cannot be removed without having a major negative effect on the social and economic benefits that these uses bring. If achieving 'good status' would require changes to a water body's hydromorphology that would likely have significant adverse effects on the social or economic activity, then it can be designated as an artificial or heavily modified water body. There are usually social and economic functions attached to this designation also, which form part of the criteria for this designation.

4.7.2. The HMWB designation to a water body is specifically assigned to those water bodies which, as a result of physical alterations by human activity, are substantially changed in character and therefore they cannot meet good ecological status.

4.7.3. In order to be a heavily modified water body, a water body must be: Physically altered by human activity; substantially changed in character; and designated under Article 4.3.

4.7.4. As stated in Article 4.3, generally, the changes to the hydromorphology need to be long-term and alter the morphological and hydrological characteristics in order to represent a substantial change in the character of a water body.

4.7.5. Bearing the above in mind, and the results of the impact assessment, it is argued that the Scheme would not have an effect on the non-heavily modified status. To meet Heavily Modified water body status, the water body would have to fit the above criteria. The Coquet is not a heavily modified water body currently because it does not serve a purpose under navigation, recreation, flood protection, land drainage and/or water abstraction. For it to be changed to heavily modified, the Scheme would have to be contributing to these criteria. It does not do this.

5. CONCLUSION

5.1. FINDINGS

- 5.1.1. The assessment presented in this WFD Addendum has concluded that the proposed Stabilisation Works and Southern Access Works (Section 2.1) will not result in water body element degradation and therefore water body status degradation. Further, the non-heavily modified status (HMWB) is considered to remain, contrary to correspondence that suggests otherwise.
- 5.1.2. Construction works are programmed to last for 16 months. Effects from construction to the water body elements are largely localised in scale and effect. There are activities which have the potential to cause negative impacts. Where this is the case, mitigation measures and/or controls have been recommended that would negate this.
- 5.1.3. Under operation, the protection of the bank will lead to localised impacts to the structure of the riparian zone and minor changes in the structure and bed substrate however river continuity will be unaffected by the proposed works and there will be no barrier to sediment movement through the works area. The proposed works would have no impact on the hydrological regime of the river or connection to groundwater bodies. It is therefore not expected that the rock armour scour protection would cause deterioration to the WFD status of hydromorphological quality indicators.
- 5.1.4. Under construction, the duration of the works would be short-term (16 months for near-channel and in-channel works) and once completed, the natural bed and banks (outside the extent of any permanent rock armour scour protection works) would be reinstated to the baseline profile and where feasible would be planted to facilitate recovery of the riparian structure. Construction related impacts on hydromorphological processes would cease. As such, impacts to the hydromorphological quality element are considered localised, short-term and reversible with the commitment to reinstatement following completion of the works.
- 5.1.5. Rock armour, through careful and appropriate design, and incorporation of best practice, is considered to provide adequate and suitable mitigation. Scour protection is likely to provide some habitat for macroinvertebrate and fish species. In its absence, there would be a requirement for future reparation and/or maintenance which may damage (or put at risk) WFD quality elements.

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A1inNorthumberland@highwaysengland.co.uk

or call **0300 470 4580***.