



Haweswater Aqueduct Resilience Programme

HARP Proposed Marl Hill Section - EIA Scoping Report Addendum

February 2021

United Utilities



Water for the North West



Haweswater Aqueduct Resilience Programme

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Contents

- i. Introduction 1**
- i.i Purpose of the Report 1
- i.ii Approach to the Scoping Addendum 1
- i.iii Design Changes to the Proposed Marl Hill Section 1
- i.iv Structure of the Scoping Addendum 3
- 3. The Proposed Marl Hill Section 4**
- 3.1 Introduction 4
- 3.2 Indicative Development Envelope 4
- 3.3 The Existing Asset 4
- 3.4 General Approach to Design and Construction 4
- 3.5 Proposed Marl Hill Section 4
- 3.6 Construction and Commissioning Programme 7
- 9. Ecology 8**
- 9.1 Overview 8
- 9.2 Proposed Methodology 8
- 9.3 Proposed Assessment Criteria 9
- 9.4 Existing Baseline and Preliminary Assessment 9
- 9.5 Potential Effects 10
- 9.6 Design and Mitigation 10
- 9.7 Ecology Summary Scope for the EIA 10
- 14. Communities and Health 12**
- 14.1 Overview 12
- 14.2 Proposed Communities Methodology 12
- 14.3 Proposed Communities Assessment Criteria 12
- 14.4 Proposed Health Methodology 14
- 14.5 Proposed Health Assessment Criteria 14
- 14.6 Existing Conditions 14
- 14.7 Potential Effects 15
- 14.8 Mitigation 15
- 14.9 Summary Scope for the EIA 15
- 17. Noise and Vibration 17**
- 17.1 Overview 17
- 17.2 Proposed Methodology 17
- 17.3 Proposed Assessment Criteria 17
- 17.4 Existing Conditions 19
- 17.5 Potential Effects 19
- 17.6 Design and Mitigation 19
- 17.7 Summary Scope for the ES 20

18. Air Quality and Climate Change	21
18.1 Overview	21
18.2 Proposed Methodology.....	21
18.3 Proposed Assessment Criteria	23
18.4 Existing Conditions.....	24
18.5 Potential Effects	24
18.6 Summary Scope for the ES.....	25
Appendix A. Minor Scoping Changes.....	26

i. Introduction

i.i Purpose of the Report

- 1) This report is an Addendum to the Haweswater Aqueduct Resilience Programme (HARP) Proposed Marl Hill Section – Environmental Impact Assessment (EIA) Scoping Report (the October 2019 Scoping Report) which was submitted to Ribble Valley Borough Council in October 2019. The October 2019 Scoping report was prepared in support of an EIA Scoping request for the Proposed Marl Hill Section. Ribble Valley Borough Council subsequently responded to the EIA Scoping Request in correspondence dated 24 December 2019 (Ref. JM/3/2019/0981).
- 2) This Addendum has been prepared to support a second, updated EIA Scoping Request for the Proposed Marl Hill Section. It is required due in part to stakeholder consultation feedback, design changes and additions, scheme refinements and the need for alternative methodologies which have arisen since the first Scoping Opinion was published by Ribble Valley Borough Council.
- 3) The alternative methodologies, design changes and refinements have in turn resulted in some changes to the proposed scope of the HARP EIA. Alternative methodologies have been proposed in cases where good practice guidance has been updated (for example, air quality), or a more detailed understanding of the Proposed Marl Hill Section has enabled refinements to our approach (for example, communities). In some cases, such as the climate change agenda, we have responded to feedback provided in the first HARP Scoping Opinions.
- 4) This Addendum therefore outlines where changes have arisen in relation to the October 2019 Scoping Report, while also confirming where approaches, methodologies and anticipated outcomes remain broadly the same.
- 5) It is important to note that this Addendum should be read in conjunction with the October 2019 Scoping Report – while it does not supersede the 2019 Scoping Report, there is a requirement for an updated Scoping Request to be submitted to Ribble Valley Borough Council. In many instances the nature and scope of the proposed EIA remains unaltered, and in these cases the relevant sections of the October 2019 Scoping Report remain valid. The Addendum therefore accounts only for:
 - Substantive construction or design-related changes and additions arising after submission of the October 2019 Scoping Report
 - Instances where technical approaches or methodologies have changed over the intervening period, for example in response to changes in published guidance or stakeholder consultation feedback
 - New information relevant to EIA scoping has been developed.

i.ii Approach to the Scoping Addendum

- 6) The 2017 Environmental Impact Assessment Regulations (*the EIA Regulations*) state that a Scoping Report should provide an explanation of the likely significant effects of the development on the environment. The EIA Regulations also require a plan sufficient to identify the land required for the proposed development. This Addendum provides an update to certain elements of detail of the original proposals, which overall remain the replacement of the five single line tunnel sections of the Haweswater Aqueduct in Cumbria, Lancashire and Greater Manchester (Figure 1.1), as outlined in Chapter 1 of the October 2019 Scoping Report. An updated version of Figure 3.1, which shows the land required for the Proposed Marl Hill Section, is also provided in the Addendum.

i.iii Design Changes to the Proposed Marl Hill Section

- 7) The October 2019 Scoping Report indicated a below ground tunnel corridor approximately 4.1 km in length with a small additional distance (approximately 200 m) of open-cut trenching at the surface to transition from the new tunnel to the retained multi-line sections.

- 8) At the time of the October 2019 Scoping Report the preferred option was an alignment to the east of the existing aqueduct with a short section of open cut to connect onto the existing aqueduct. The preferred option for the Proposed Marl Hill section is consistent with the October 2019 Scoping Report, with development of design detail and understanding of construction techniques at the Bonstone Compound (formerly Construction Area A) and Braddup Compound (formerly Construction Area B). Table 1 below summarises the key design and construction changes which differ from the October 2019 Scoping Report. More detail on these changes and additions is provided in Section 3.5. An updated Figure 3.1 shows the route of the Proposed Marl Hill Section. Additionally, proposed transport routes on the public highway and construction compound accesses have been identified and are illustrated in Figure 3.1A.
- 9) This Addendum has been prepared in conjunction with other Addendum reports dealing with changes and updates to the other proposed replacement HARP tunnel sections. This supports a consistent approach across each of the nine planning applications to be submitted in connection with the Proposed Programme of Works.

Table 1: Comparison of Proposed Marl Hill Section features described in the 2019 and 2021 reports

Feature	October 2019 Scoping Report	January 2021 Scoping Addendum
Construction Area A (Bonstone Compound)	Broad indicative envelope (14.72 ha) for the construction compound.	Indicative envelope refined, including access into the compound. Reduction in area to 9.32 ha.
Construction Area B (Braddup Compound)	Broad indicative envelope (47.88 ha) for the construction compound.	Reduction in the size of the construction area to 15.44 ha.
Clitheroe Park and Ride*	Not presented in the 2019 report – a 2020 design development.	Parking location for construction workers' private cars and vans at the existing Cement Works staff car park on West Bradford Road- 0.54 ha
Clitheroe HGV Holding Area*	Not presented in the 2019 report – a 2020 design development.	Holding location for approximately 10 exceptional load vehicles within the existing cement works– 2.13 ha.
Ribble Crossing*	Not presented in the 2019 report – a 2020 design development.	Proposed temporary haul road – 20 ha.
Highways Works	Not presented in the 2019 report – a 2020 design development.	Minor, localised highways works such as passing places and road widening at discrete locations on the public highway to enable the safe passage of construction vehicles and other road users. Some works may require temporary use of third party land.
Management of surplus arisings from tunnel boring	The 2019 report advised that the final destination for surplus tunnel arisings and other materials was under consideration.	Following in-principle agreement between United Utilities and the operators of Waddington Fell Quarry, the basis of assessment for the EIA will be an assumption that all surplus material would be directed to the quarry for processing and placement as part of the site's restoration plan.

*These features form part of both the Proposed Bowland Section and Proposed Marl Hill Section. They would be shared by traffic associated with both developments should both applications receive planning consent.

i.iv Structure of the Scoping Addendum

- 10) The chapter numbering sequence in this Scoping Addendum is the same as the original Scoping Report. For this reason, the next chapter is Chapter 3. Where applicable, the chapters describe how the nature and scope of the environmental assessment has changed since the October 2019 Scoping Report in response to design changes, stakeholder consultations and revised methodologies.

Initial Chapters

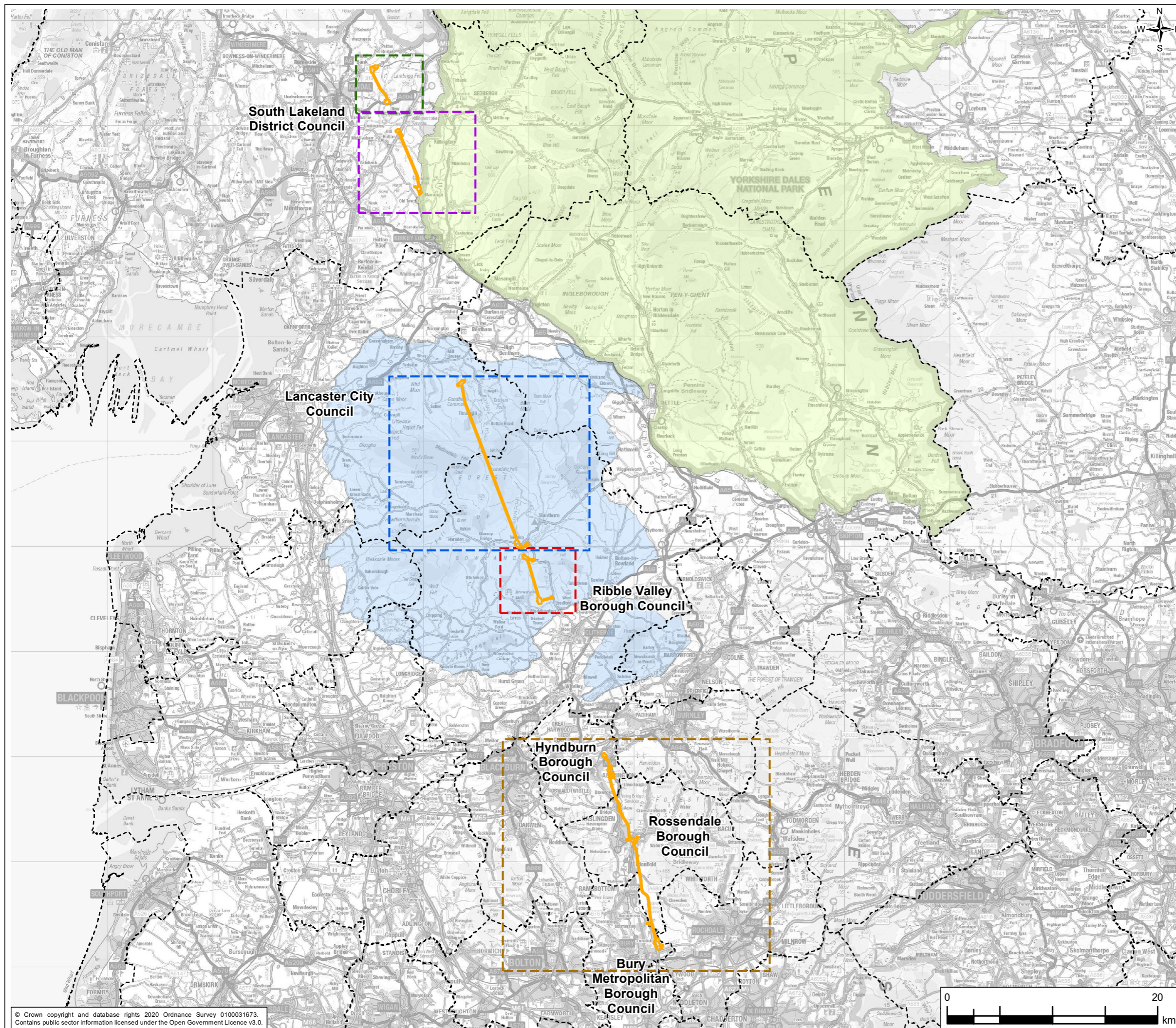
- 11) The first five chapters of the October 2019 EIA Scoping Report were introductory chapters which provided the reader with background information about: the Proposed Programme of Works (replacement of all tunnel sections on the existing Haweswater Aqueduct); the Proposed Marl Hill Section; and the general approaches to the EIA and planning application. To avoid duplicating unchanged information, please refer to the original Scoping Report for the following initial chapters:
- Chapter 1: Introduction
 - Chapter 2: The Proposed Programme of Works
 - Chapter 4: Approach to Planning and the Environmental Statement
 - Chapter 5: Approach to Scoping.
- 12) An update to Chapter 3: The Proposed Marl Hill Section is contained in this Addendum to provide the new design information.

Topic-Specific Chapters

- 13) The scope and approach to Chapter 15: Major Accidents and Disasters has not been affected by changes to the proposed design. Additional information is therefore not provided in this Scoping Addendum for this topic and the text in the original Scoping Report remains valid.
- 14) Only minor and non-substantive changes have been made to the methodology and approaches to the following eight EIA topics. These changes will be applied not only to the original scope of the development proposals, but also the new additional elements described in Table 1. The changes for these topics are detailed in Appendix A of this Scoping Addendum:
- Chapter 6: Landscape and Arboriculture
 - Chapter 7: Water Environment
 - Chapter 8: Flood Risk
 - Chapter 10: Cultural Heritage
 - Chapter 11: Soils, Geology and Land Quality
 - Chapter 12: Materials and Waste
 - Chapter 13: Public Access and Recreation
 - Chapter 16: Transport Planning.
- 15) It is anticipated that the remaining four topic specific chapters will have more substantive changes because their scope and methodology have been updated in response to design updates and consultation feedback received during the original scoping exercise and subsequent to this over the intervening months. These changes are described in this Scoping Addendum:
- Chapter 9: Ecology
 - Chapter 14: Communities and Health
 - Chapter 17: Noise and Vibration
 - Chapter 18: Air Quality and Climate Change.

FIGURE 1.1

- Legend**
- Indicative Development Envelope Boundary
 - Proposed Docker Section
 - Proposed Swarther Section
 - Proposed Bowland Section
 - Proposed Marl Hill Section
 - Proposed Haslingden and Walmersley Section
 - Planning Authority Boundary
 - Yorkshire Dales National Park
 - Forest of Bowland Area of Outstanding Natural Beauty



Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
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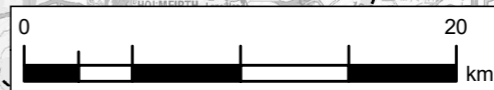
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3. The Proposed Marl Hill Section

3.1 Introduction

- 16) The following chapter describes the general approach for the Proposed Marl Hill Section and sets out any changes to the basis of the October 2019 Scoping Report. Further details regarding the enabling works, construction works, commissioning phase and reinstatement activities for the proposed works can be found in Chapter 3 of the October 2019 Scoping Report.

3.2 Indicative Development Envelope

- 17) Figure 3.1 is an updated drawing which shows the land that presently falls within an indicative reasonable 'worst-case' development envelope for the Proposed Marl Hill Section. It is important to note that Figure 3.1 is not intended to imply that the entire area will be developed. Instead it shows indicative areas of land within which construction and operation phase activities might take place. Nevertheless, the development envelope is significantly reduced in area but not in spatial extent in the updated drawing when compared with the October 2019 Scoping Report.

3.3 The Existing Aqueduct

- 18) Please refer to Chapter 3.3 of the October 2019 Scoping Report for details regarding the existing Haweswater Aqueduct.

3.4 General Approach to Design and Construction

- 19) Please refer to Chapter 3.3 of the October 2019 Scoping Report for details regarding the general approach to design and construction.

3.5 Proposed Marl Hill Section

- 20) The Proposed Marl Hill Section would replace an existing 4.3 km section of aqueduct between Newton-in-Bowland and Waddington. It would be constructed by a Tunnel Boring Machine (TBM) below ground level with short open-cut surface trenching sections at each end making connections back to the existing aqueduct. The new tunnel would be bored in a northerly direction from a shaft at the south end of the tunnel. The Marl Hill tunnel would have a launch compound at Bashall Eaves (referred to as the Braddup Compound) approximately 4.5 km to the northwest of Clitheroe. A construction compound with a reception shaft would be located approximately 1.5 km south of Newton-in-Bowland (referred to as the Bonstone Compound). The route of the Proposed Marl Hill Section passes from the Hodder valley below Waddington Fell, where land uses mainly comprise a mixture of upland moorland and agriculture.
- 21) The indicative development envelope for surface-based activities associated with the Proposed Marl Hill Section encompasses some 56.42 ha of predominantly agricultural land, although the Clitheroe Park and Ride and HGV Holding Area are presently used for car parking and HGV storage, respectively. The combined 56.42 ha area comprises:
- The indicative development envelope for construction accesses and construction areas
 - Ribble Crossing
 - Clitheroe Park and Ride and HGV holding area at the cement works on West Bradford Road.
- 22) The October 2019 EIA Scoping Report Figure 3.1 previously identified an indicative corridor for a proposed water discharge pipe serving the new aqueduct. This has now been removed from the scope of the proposals and instead an existing outfall structure on the existing Haweswater Aqueduct would be used.
- 23) The consideration of alternative construction options for the proposed Marl Hill Section will be discussed in the ES

Bonstone Compound

- 24) The Bonstone Compound (formerly Construction Area A) would be a reception site for the TBM. A 15 m diameter shaft would be constructed to receive the TBM arriving from the Braddup drive site at the end of tunnel boring activities. This shaft would be constructed in advance of the arrival of the TBM and be made safe until the TBM arrives. At this point large cranes would be used to lift the TBM from the shaft and load this on to lorries for removal from site.

Braddup Compound

- 25) As described above the Braddup Compound (formerly Construction Area B) would be the launch site for the TBM.

Access to Braddup and Bonstone Compounds

- 26) The selection of a transport route to the proposed compounds is presently under consideration. There are two potential transport routes: Route 1 and Route 2 together form one solution using existing public highways; Route 3 is a second solution and comprises a newly-constructed, dedicated haul route.
- 27) Route 1 would serve construction vehicles up to 3.5 m in height. Vehicles travelling to the Braddup and Bonstone Compounds from the A59 at Clitheroe would travel via Pimlico Link Road, Chatburn Road and north on Waddington Road below the limited headroom railway bridge towards and through the village of Waddington. Vehicles over 3.5 m in height would have to avoid the limited headroom railway bridge and would be directed via Pimlico Link Road, through Chatburn and Grindleton, and along West Bradford Road towards Waddington (Route 2). Route 1 and Route 2 together represent one transport route solution.
- 28) An alternative transport route solution, the Ribble Crossing, has been developed following local stakeholder consultations. The *Ribble Crossing* (Route 3) could be used to avoid the villages of Chatburn, Grindleton and West Bradford.
- 29) For the purposes of the EIA and the planning application, Route 1 and Route 2 will be considered in combination, while Route 3 will be reported separately in isolation from Route 1 and Route 2. The two transport route solutions are mutually exclusive, and it is anticipated that only one would be taken forward for consideration at planning committee.

Clitheroe Park and Ride

- 30) In consultation with Lancashire County Council highways officers during 2020, it was agreed in principle that a park and ride facility located off the A59 in the Clitheroe area would assist in reducing traffic numbers on the local road network towards the Marl Hill and Bowland Compounds. It is proposed that contractors commuting to the compounds would park their vehicles at the park and ride facility, before being transported to the compounds by minibus. The park and ride facility may contain welfare facilities and a security presence.

Clitheroe HGV Holding Area

- 31) On occasion, throughout the course of the enabling works and construction activities and site reinstatement works at the construction compounds, there would be a requirement for exceptional loads and small fleets of HGVs to be marshalled off the public highway. This may be required for example in situations where exceptional loads, with the agreement of the highways authority, can be released onto the local 'B' road network only at certain times of the day, in the interests of road safety and to avoid inconveniencing other road users.

Ribble Crossing

- 32) A proposed temporary haul road – the Ribble Crossing - has been developed in response to community consultation and a request for United Utilities to examine options to reduce the levels of construction traffic that would pass through local communities in the Clitheroe area. It would involve the construction of a dedicated sealed road across open farmland. The temporary haul road would be approximately

1450 m long and start in the vicinity of the cement works at West Bradford Road (just south of the River Ribble), involving the construction of a temporary, approximately 70 m clear span bridge over the River Ribble with three 35 m spans across the floodplain. It would head in a northerly and westerly direction to connect back into West Bradford Road in between Waddington and Waddington and West Bradford C.E. Primary School.

- 33) If approved, the haul route would be constructed as part of the enabling works prior to construction of the main compounds. The route would be a temporary feature that would be removed entirely following completion of the HARP construction programme in the Ribble Valley area; land would be reinstated back to its current use and setting. Further consultation is proposed between interested parties to establish how the proposed Ribble Crossing will be presented in the Marl Hill and Bowland planning application in conjunction with potential access routes on the public highway. It is anticipated that the two options would be included in the planning application, however, it is envisaged that only one would be granted consent (informed through consultation) during the planning application determination phase.

Highways Works

- 34) It is anticipated that public highways works would be required at approximately 30 locations on roads in the Ribble Valley area. The need for, and the scope of, the highways works have been developed in consultation with Lancashire County Council's highways department.
- 35) The works would include small (approximately 25 m x 2 m) passing places or sections of road widening to enable oncoming HGVs to pass each other and local traffic without the need to reverse or manoeuvre onto the roadside verge. Junction improvements are also proposed to provide enough space for larger vehicles when turning from one road to another. While some of the works could be constructed within highways land, others would require access to and / or construction on third party land. This may require the temporary removal of field boundaries such as dry stone walls, and the removal of trees and hedgerows. Tree and hedgerow reinstatement plans would be developed in consultation with the local authority, its specialist advisors and the AONB Board.
- 36) The highways works would be delivered during the enabling works. To form a basis of assessment for the EIA, it has been assumed that passing places and sections of road widening involving third party land would be reinstated. Passing places and sections of road widening within the highway land would be retained permanently following completion of the construction works. The fate of all highways works following completion of construction would be subject to future agreement with the Local Highways Authority and Ribble Valley Borough Council.

Management of surplus arisings from tunnel boring

- 37) The October 2019 Scoping Report proposed that tunnel arisings may require disposal at a suitably licensed destination, such as a quarry undergoing restoration or an operational landfill, and confirmed that work was underway to review options for the management of surplus material.
- 38) During 2020 United Utilities entered into discussion with the operators of Waddington Fell Quarry to explore options for the use of tunnel arisings from the Bonstone and Braddup Compounds (and from the Proposed Bowland Section, although this is subject to a separate Scoping Addendum) at the quarry. This solution would have the benefit of substantially reducing vehicle numbers on the road network through Waddington and Clitheroe. The operators of Waddington Fell Quarry are presently seeking planning consent from Lancashire County Council to enable this solution to be delivered. The basis of assessment for the Proposed Marl Hill Section EIA will therefore assume that the destination for all materials being exported off site is covered under a separate planning application. The Proposed Marl Hill Section ES will consider only the direct and indirect effects of vehicle movements to and from the quarry, such as traffic impacts and air quality effects; the processing or use of material upon arrival at the quarry is excluded from the proposed scope of the EIA.





3.6 Construction and Commissioning Programme

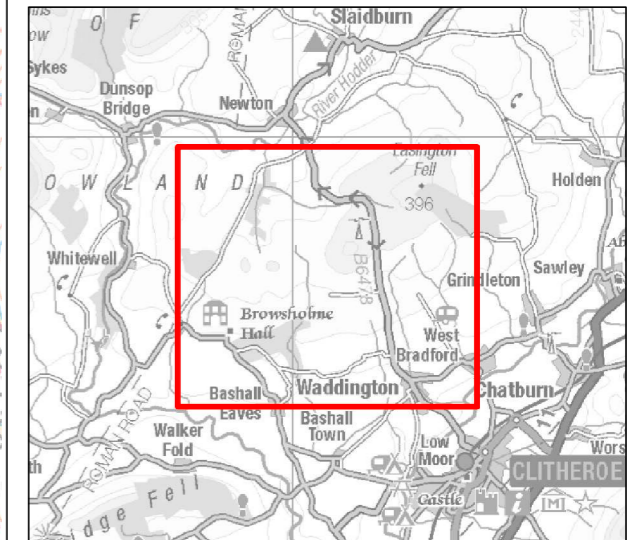
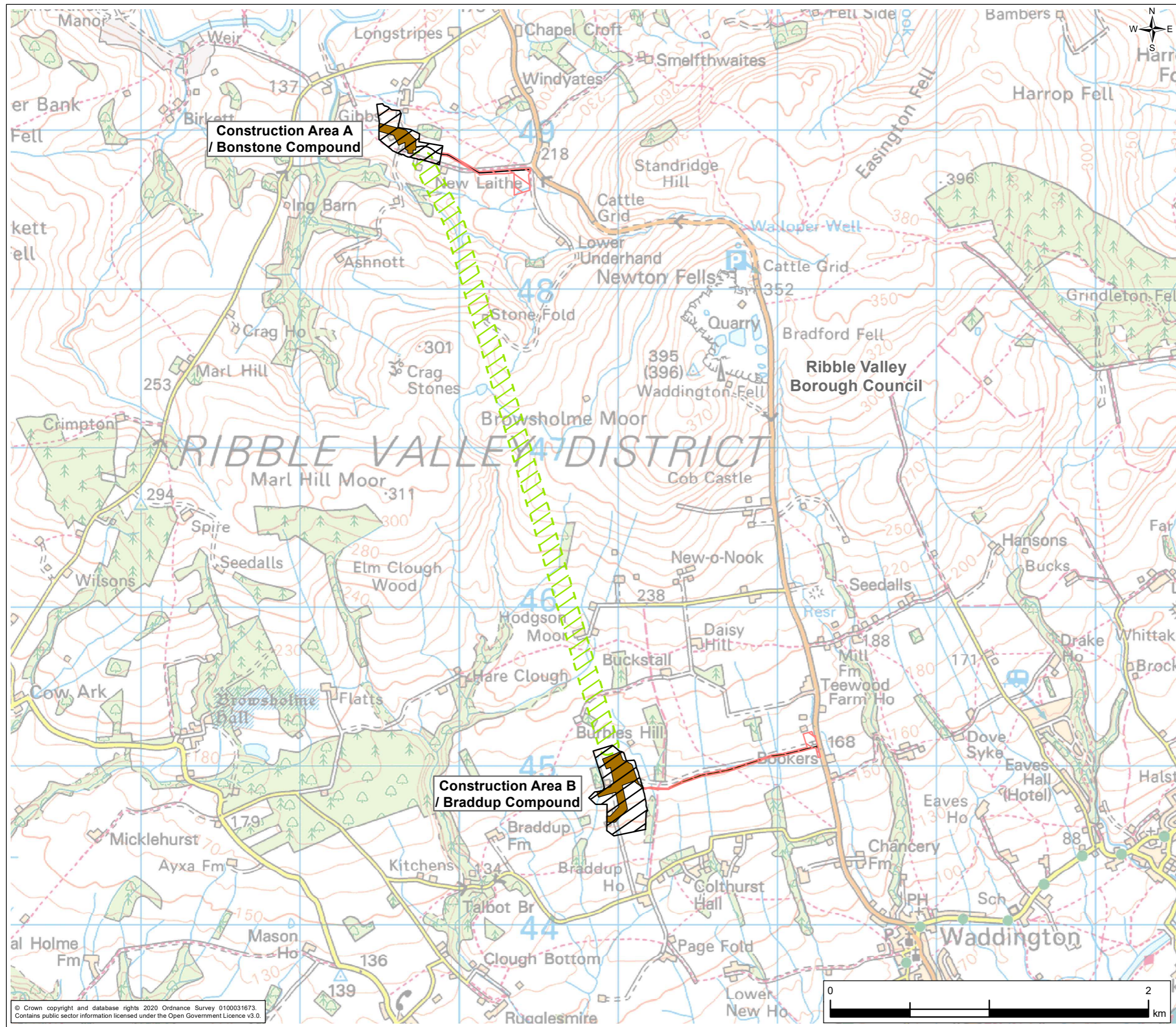
- 39) An indicative Construction Programme is shown in Figure 3.3 and presents a high-level overview of when proposed construction works could be undertaken, subject to planning permission. Figure 3.3 shows that the proposed Programme of Works could start in 2023, with enabling works, ultimately reaching completion and commissioning in 2029. The indicative programme provided does not include reinstatement works, which may continue for several years beyond the completion of construction. The dates and durations are indicative and will be developed further as the design progresses.
- 40) The construction programme would be phased so that some of the proposed new sections of aqueduct could start later and / or be completed earlier than others. Some could be completed prior to the overall indicative construction programme end date in 2028 (noting that decommissioning of the existing asset could extend into 2029).

Figure 3.3: Indicative Construction Programme

Build Phase	2023				2024				2025				2026				2027				2028			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Docker																								
Swarther																								
Bowland																								
Marl Hill																								
Haslingden & Walmersley																								

FIGURE 3.1

- Legend**
-  Proposed Construction Access - Indicative
 -  Proposed Construction Compound/Laydown Area - Indicative Development Envelope
 -  Proposed Tunnel Route - Indicative
 -  Proposed Indicative Construction Compound / Laydown Area



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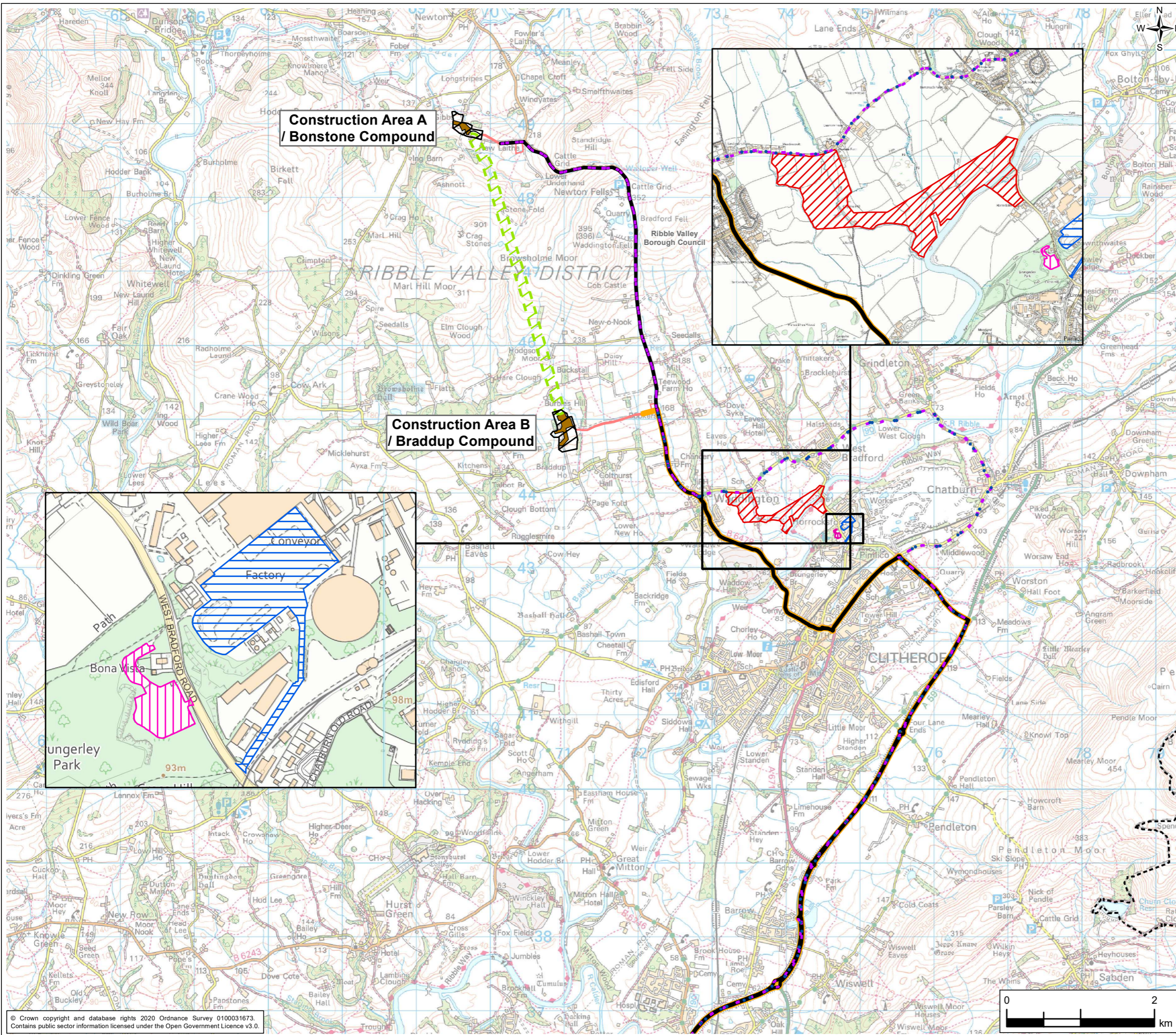
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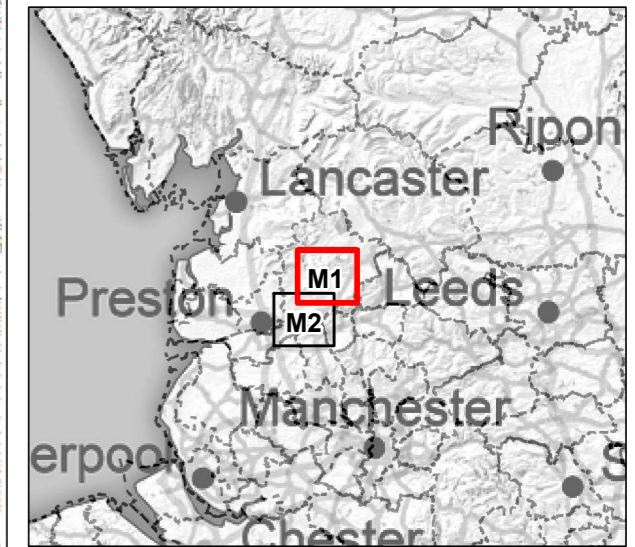
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FIGURE 3.1A



- Legend**
- Proposed Construction Access - Indicative
 - Proposed Construction Compound/Laydown Area - Indicative Development Envelope
 - Proposed Tunnel Route - Indicative
 - Proposed Indicative Construction Compound/Laydown Area
 - Ribble Crossing - Route 3
 - Clitheroe HGV Holding Area
 - Clitheroe Park and Ride
 - Planning Authority Boundary
- Compound Haul Routes**
- Bonstone Compound - Route 1
 - Bonstone Compound - Route 2
 - Braddup Compound - Route 1
 - Braddup Compound - Route 2



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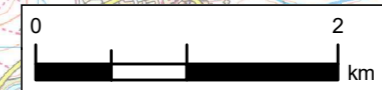
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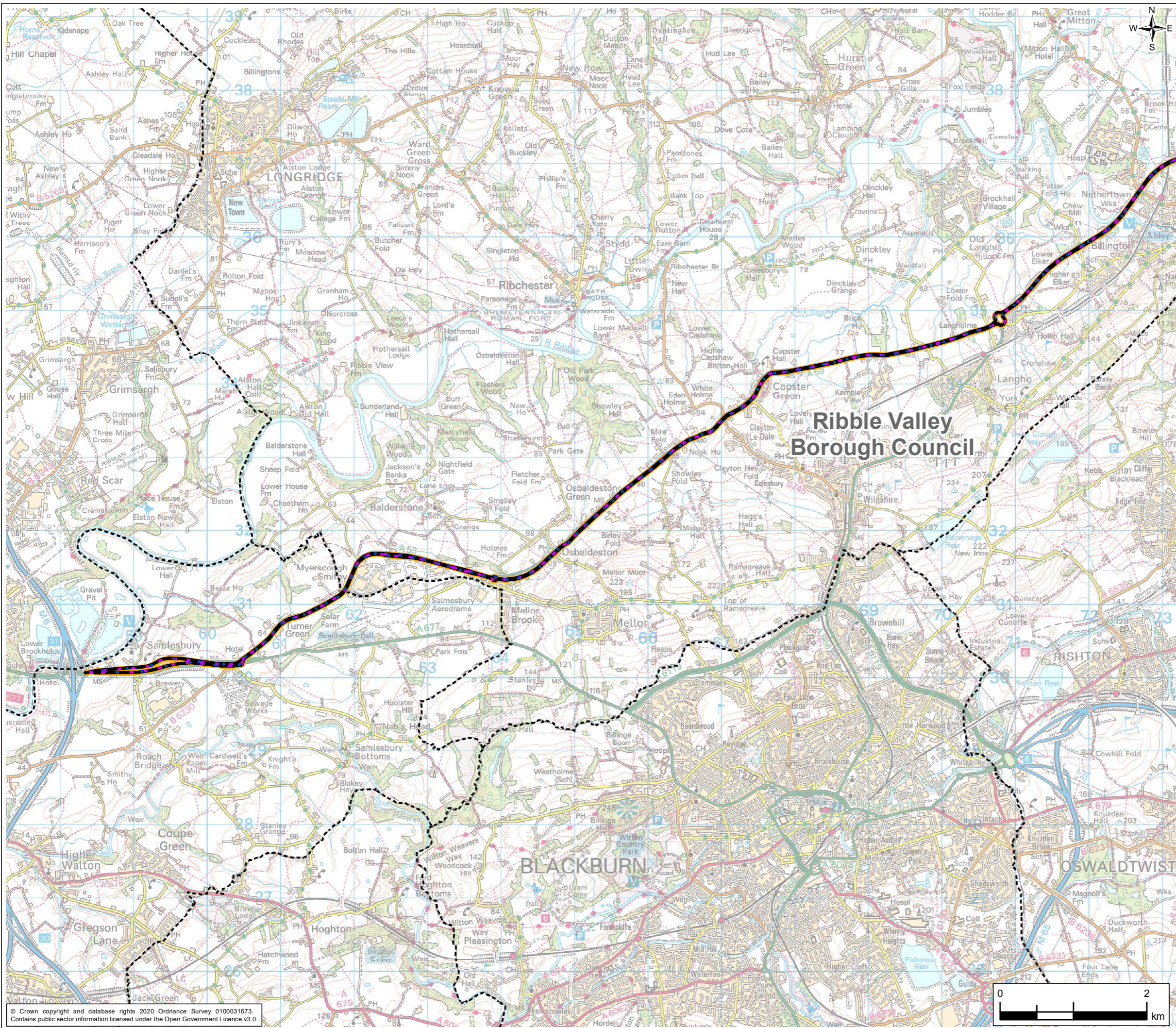
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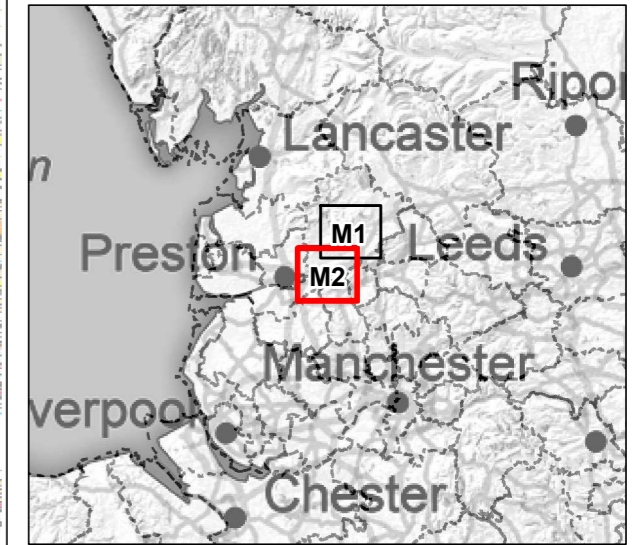
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FIGURE 3.1A



Legend

- Planning Authority Boundary
- Compound Haul Routes**
- Bonstone Compound - Route 1
- - - Bonstone Compound - Route 2
- Braddup Compound - Route 1
- - - Braddup Compound - Route 2



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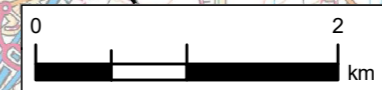
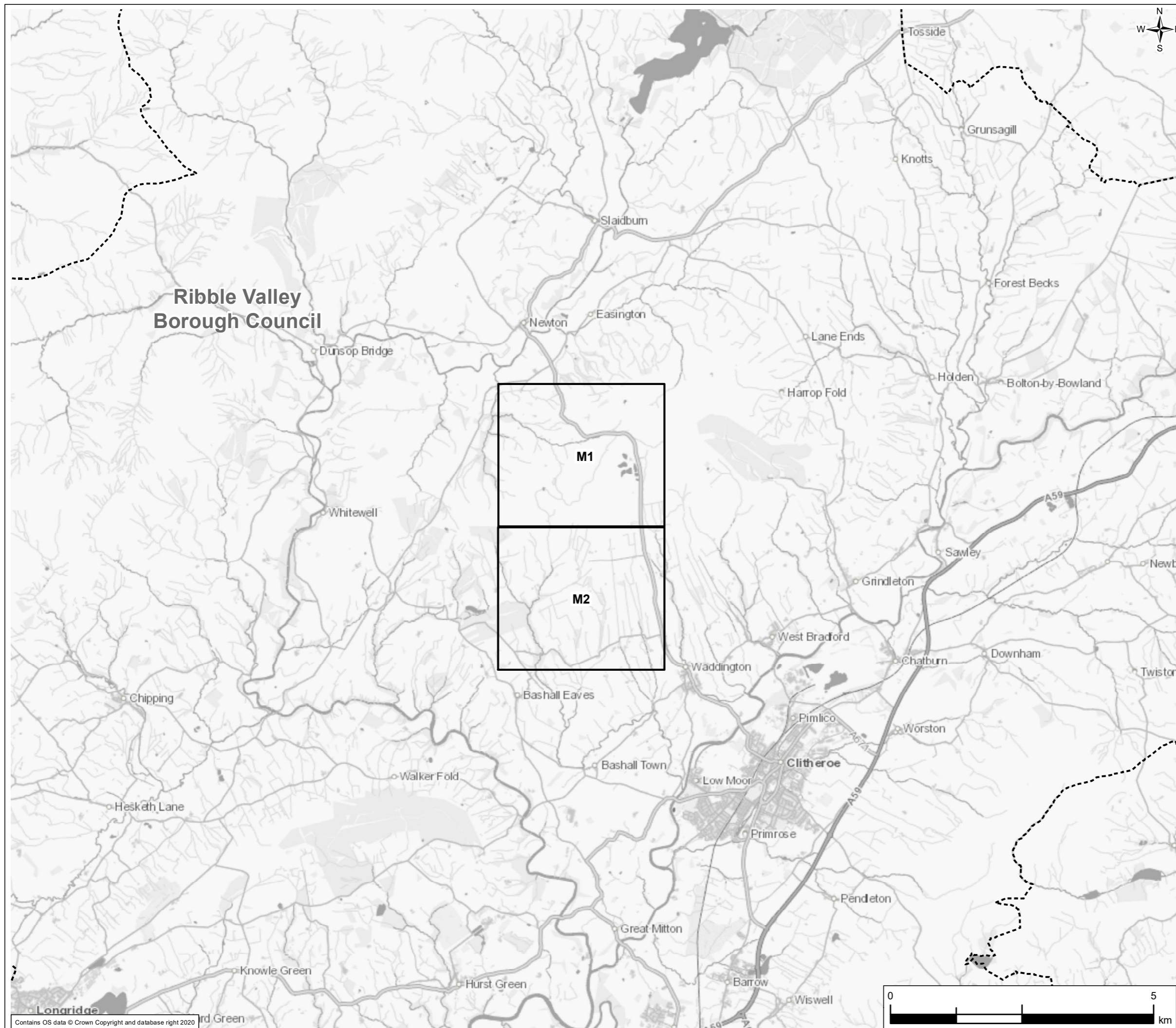


FIGURE 3.2

Legend

----- Planning Authority Boundary



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**HAWESWATER AQUEDUCT
 RESILIENCE PROGRAMME**

Drawing Title
**INDICATIVE DEVELOPMENT ENVELOPE SHEET LAYOUT
 PROPOSED MARL HILL SECTION AREA EXTENT**

Drawing Status
FINAL

Scale @ A3
 1:70,000 DO NOT SCALE

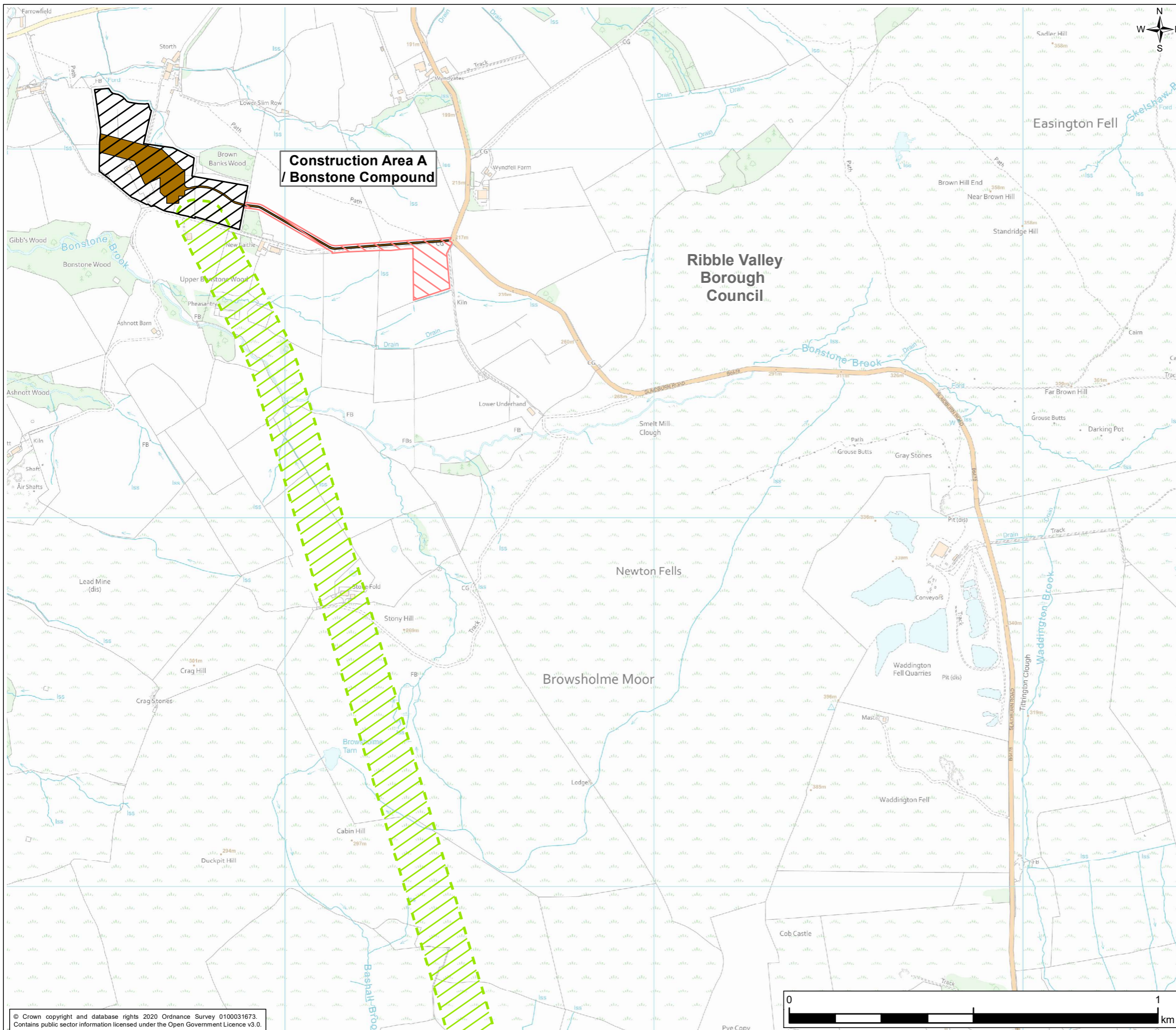
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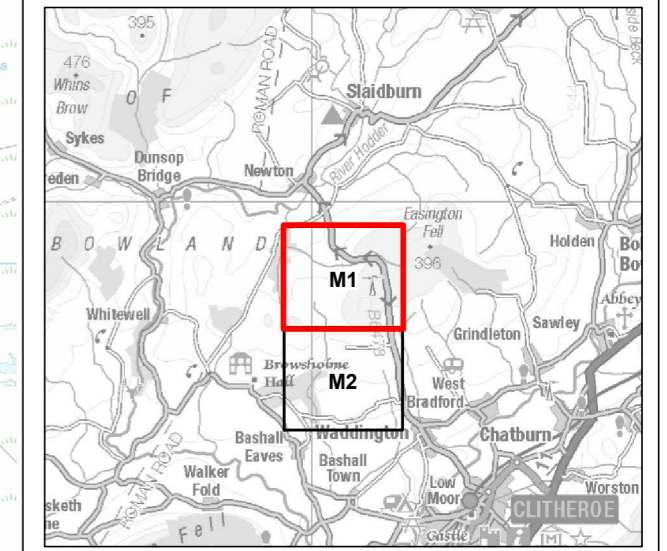


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M1

- Legend**
-  Proposed Construction Access - Indicative
 -  Proposed Construction Compound/Laydown Area - Indicative Development Envelope
 -  Proposed Tunnel Route - Indicative
 -  Proposed Indicative Construction Compound/Laydown Area



Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
1	JAN 21	Scoping Addendum	SP	LH	LH	SH
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Project **HAWESWATER AQUEDUCT RESILIENCE PROGRAMME**

Drawing Title **INDICATIVE DEVELOPMENT ENVELOPE PROPOSED MARL HILL SECTION SHEET 1 OF 2**

Drawing Status **FINAL**

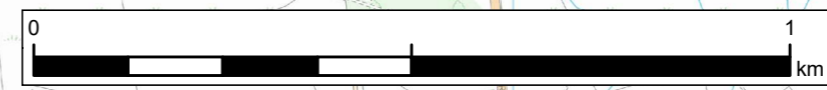
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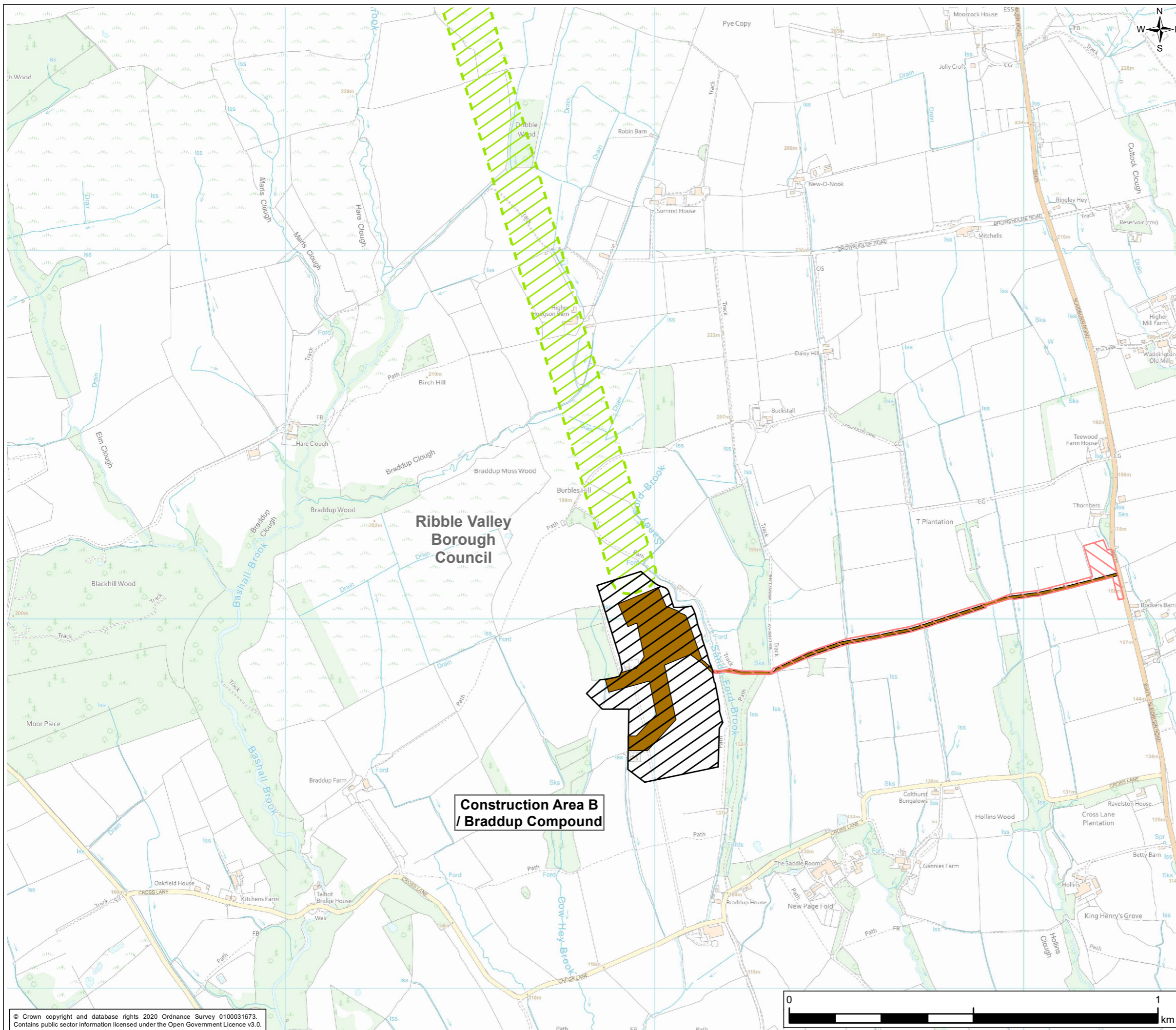
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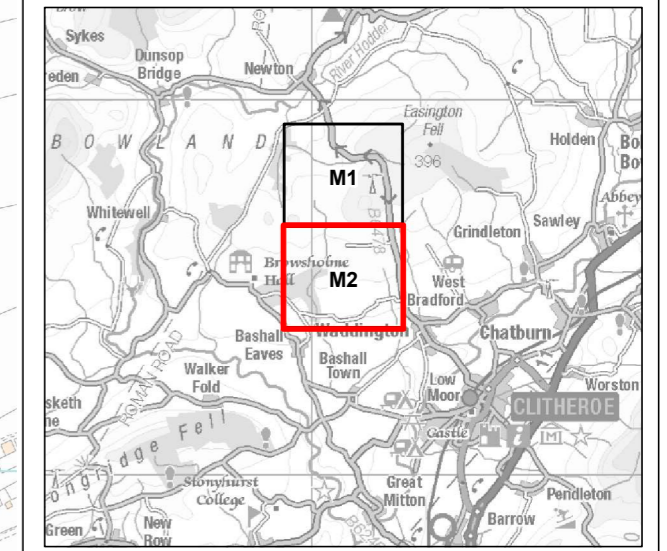
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- Legend**
-  Proposed Construction Access - Indicative
 -  Proposed Construction Compound/Laydown Area - Indicative Development Envelope
 -  Proposed Tunnel Route - Indicative
 -  Proposed Indicative Construction Compound/Laydown Area



1	JAN 21	Scoping Addendum	SP	LH	LH	SH
0	OCT 19	Initial Issue	LT	IM	TA	SH
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Project **HAWESWATER AQUEDUCT RESILIENCE PROGRAMME**

Drawing Title **INDICATIVE DEVELOPMENT ENVELOPE PROPOSED MARL HILL SECTION SHEET 2 OF 2**

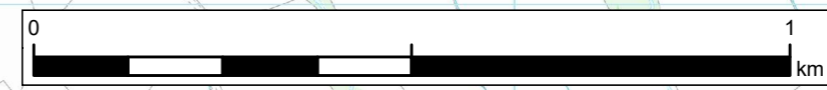
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9. Ecology

9.1 Overview

- 41) For the purpose of this chapter, the development envelope considered within this scope includes the proposed construction compounds (including laydown areas and open cut, shaft, valve house and temporary outfall elements of the scheme), the proposed construction access routes and any highways works included with the planning application.
- 42) The Ecology Chapter (Chapter 9) of the Environmental Statement has been split into two sub chapters:
- Chapter 9a Terrestrial Ecology
 - Chapter 9b Aquatic Ecology.
- 43) This report does not replicate but instead only describes the changes of scope from the October 2019 Scoping Report.

9.2 Proposed Methodology

9.2.1 Desk Study

- 44) As the proposals for the Marl Hill Section evolved the desk study was updated in summer 2020 to ensure data was gathered in line with the search zones identified in the original October 2019 Scoping Report.
- 45) The following additional sources were reviewed for the Aquatic Ecology ES Chapter:
- Ecological datasets for the period 2009 – 2019 were obtained *via* the Environment Agency Ecology and Fish Data Explorer website¹, this data included:
 - National Fish Populations Database (NFPD): Freshwater Fish Counts for all Species for all Areas and all years. NFPD consists of information collected from fisheries monitoring work on rivers and lakes. This monitoring work is undertaken by the Environment Agency
 - Data for freshwater and marine biological surveys for macroinvertebrates, diatoms and macrophytes in England. The Environment Agency undertakes freshwater and marine biological monitoring in England. Freshwater and Marine Biological Surveys England is a large dataset containing taxonomic level species data for biological surveys carried out in freshwater and marine environments. This archive is more commonly known as BIOSYS
 - Other data sources utilised during the desk study:
 - Aerial photography (MAGIC, 2020)
 - Environment Agency Catchment Data Explorer (CDE) (Environment Agency, 2019)²
 - Designated areas (Natural England, 2020)³
 - North West River Basin Management Plan (Environment Agency, 2018).
- 46) For the purpose of assessing air quality effects the scope includes European sites within 10 km and national and local designations within 2 km of the Bonstone and Braddup compounds. It is currently understood that the traffic movements do not meet the threshold for requiring assessment along the construction traffic routes, but generator use at compounds would need air quality assessment. For further information please refer to the air quality section of this Addendum. The citations of the designations within these search zones were reviewed to identify nitrogen sensitive habitats as identified on the Air Pollution Information System website (www.apis.ac.uk), the following bullet points list those habitats used to scope sites into the assessment.

¹ Environment Agency Ecology and Fish Data Explorer website <https://environment.data.gov.uk/ecology-fish/>. Accessed May-July 2020.

² Environment Agency Catchment Data Explorer website <https://environment.data.gov.uk/catchment-planning/>. Accessed May-July 2020.

³ Natural England Designated Sites View website <https://designatedsites.naturalengland.org.uk/SiteSearch.aspx>. Accessed May-July 2020.

- Acid grassland
- Bogs
- Ancient woodland
- Calcareous grassland
- Coastal and floodplain grazing marsh
- Dunes, shingle and machair
- Dwarf shrub heath
- Fen and marsh and swamp
- Inland rock and scree
- Maritime cliff and slopes
- Unimproved neutral grassland
- Lichen and moss communities.

9.2.2 Field Surveys

- 47) Surveys continued into 2020 either where changes to scheme design introduced new locations or where seasonal restrictions had not allowed completion in 2019.

9.2.3 Highways Works

- 48) Highways works will be required on the local network in the form of junction improvements, road surface improvements and/or additional passing places. Given the potential for impacts associated with these works are likely to be minimal due the small footprint of works in any single location and their position (adjoining the existing road network) the scope of ecology surveys is as follows:

- Data search for protected species and designations
- Extended phase 1 habitat surveys
- Watercourse walkover survey.

- 49) Given the small scale of the highways works in any location, professional opinion is that this level of survey is sufficient to determine likely significant effects to inform the assessment in the Environmental Statement and identify mitigation requirements.

- 50) Please refer to Chapter 9.2 of the October 2019 Scoping Report for further details regarding the proposed methodology.

9.3 Proposed Assessment Criteria

- 51) Please refer to Chapter 9.3 of the October 2019 Scoping Report for further details regarding the proposed assessment criteria.

9.4 Existing Baseline and Preliminary Assessment

9.4.1 Designated Sites

- 52) The following designations no longer fall within the search zones (5 km for SSSIs and 2 km for BHSs) of the Proposed Marl Hill Section and have therefore been scoped out of the EIA process:

- Standridge Farm Pasture SSSI
- Barn Gill Meadow SSSI
- Mean Garth Wood BHS

- Swans Wood (Including Far Close Wood) BHS
- Burn End Pasture BHS
- Hollinhurst Wood BHS
- Waddington Fell Road, Roadside Verges BHS.

9.4.2 Habitats and Species of Principal Importance

53) No change.

9.4.3 Habitats within the Survey Area

54) Any updates to detailed habitat descriptions and valuations will be included in the Environmental Statement. The following additional habitats have been identified during field surveys:

- Broadleaved woodland plantation (within 50 m of the compounds)
- Conifer plantation (within 50 m of the compounds)
- Intact native species poor hedgerow (within compounds).

9.4.4 Species

55) No significant changes. Any updates to detailed species descriptions and valuations will be included in the Environmental Statement.

9.5 Potential Effects

56) Under the bullet point 'disruption of local watercourses and drainage patterns causing,' the following potential effect has been added:

- Changes to ground water dependant terrestrial ecosystems (GWDTE).

9.6 Design and Mitigation

57) Please refer to Chapter 9.6 of the October 2019 EIA Scoping Report for further details regarding design and mitigation.

9.7 Ecology Summary Scope for the EIA

9.7.1 Field surveys

58) No change.

9.7.2 Ecological Impact Assessment

59) Table 9.5 in the October 2019 EIA Scoping Report detailed the completed and proposed field surveys; significant changes to this are as follows:

- Surveys may continue beyond previously stated end dates including those required to capture areas requiring highways works
- Watercourse walk-over habitat surveys were undertaken in 2020 for watercourses within and adjacent to the Bonstone and Braddup compounds. The walk-over habitat survey methodology was based on the Environment Agency's '*Restoration of Riverine Salmon Habitats*' guidance manual (Hendry & Cragg-Hine, 1997)
- Following review of desk data and walkover surveys, no detailed fish, invertebrate or aquatic plant surveys were required
- Great crested newt eDNA surveys were undertaken of all accessible ponds within 500 m the Bonstone and Braddup compounds unless separated by a barrier to amphibian dispersal

- Following consultation with consultees the scope of bat surveys have been decreased. It was discussed that given the timeframe between completion of the Environmental Statement and the short survey shelf life that tree climbing/inspection surveys and presence/absence/backtracking surveys would be more appropriate at the point a contractor is on board and prior to submitting compound layouts and associated updated mitigation plans to the LPA. For the avoidance of doubt bat activity automated surveys, bat activity transect surveys, ground level bat tree roost assessments and data searches for bat records have all been undertaken to inform assessment of likely significant effects
- Additional habitat survey was undertaken within a buffer zone up to at least 200 m from the proposed compound red line boundaries. Where potential groundwater dependant terrestrial ecosystems (GWDTE) were identified, additional assessment was undertaken as necessary to classify the habitat type taking account of National Vegetation Communities (NVC) and SNIFFER wetland typologies
- Additional breeding bird surveys were undertaken in 2020 to cover areas of the works not accessed in 2019.

60) Please refer to Chapter 9.7 of the October 2019 Scoping Report for further details regarding the Ecological Impact Assessment.

14. Communities and Health

14.1 Overview

- 61) The authors have taken the opportunity in preparing this Scoping Addendum to provide a more focused approach to the assessment on the communities which are expected to be affected by the development.
- 62) Please refer to Chapter 14.1 of the October 2019 Scoping Report for the overview of the Communities and Health scoping assessment.

14.2 Proposed Communities Methodology

- 63) The socio-economic assessment area will be defined at a local and regional level:
- The local community assessment area (LCAA) will be defined by a 1 km boundary around all elements of the Proposed Marl Hill Section excluding the indicative corridor for the tunnel.
- 64) The LCAA has generally been extended from 500 m (as reported in the original October 2019 Scoping Report) to 1 km to capture potential community disturbance effects which could occur as a result of a combination of traffic, noise and visual impacts. Where disturbance effects could occur over a wider area, for example due to transport routes, these will be considered in the ES.
- 65) Published guidelines and criteria contained in the following documents will be referenced to assist in the evaluation of effects on the socio-economic environment (this will replace the 2019 DMRB guidance as reported in the original Scoping Report): The Design Manual for Roads and Bridges LA 112 – Population and Human Health (2020).
- 66) Please refer to Chapter 14.2 of the October 2019 Scoping Report for further details regarding the proposed communities methodology.

14.3 Proposed Communities Assessment Criteria

- 67) This Addendum provides a more focused approach to the communities assessment.. Based on this, and as a result of updates to the DMRB guidance, the assessment will be updated to include:
- Disturbance effects
 - Severance effects
 - Demands on tourism accommodation.
- 68) The updated methodology is outlined below.

Disturbance effects

- 69) For the purposes of the EIA, disturbance effects are considered to arise when a combination of two or more visual, traffic, air quality and noise effects coincide on a particular area or receptor.
- 70) Assessment findings from each of the following sections will be used in the determination of disturbance effects:
- Chapter 6: Landscape and Arboriculture
 - Chapter 16: Transport Planning
 - Chapter 17: Noise and Vibration
 - Chapter 18: Air Quality.
- 71) There is no published guidance for assessing disturbance effects on communities. The assessment of disturbance effects will therefore follow a bespoke methodology which will acknowledge that disturbance effects may occur where there is a combination of at least two environmental effects on a receptor or group of receptors.

- 72) The assessment of disturbance effects will be based on the residual effects reported by the contributing assessments i.e. effects after the proposed mitigation measures are accounted for. Professional judgement will then be applied in determining whether the combination of topic effects could result in a significant disturbance effect overall. As such, no additional sensitivity and magnitude criteria will be required for this element of the Communities and Health assessment.
- 73) Community receptors will be identified through the use of Ordnance Survey Addressbase data, site surveys, google imagery and stakeholder engagement. Receptors will be classified into the following categories: residential properties, social infrastructure, agricultural activities and commercial operations.
- 74) The full list of receptors considered in the assessment of disturbance effects will be presented in the Environmental Statement.

Severance effects

- 75) In this context, severance will concern the ability of people to access community facilities, residential property, commercial land and agricultural land. This could be due to:
 - The difficulty of crossing a heavily trafficked road
 - Highway diversions increasing journey length
 - Direct loss of access to property due to land take
 - New roads (in this context – temporary haul routes and access tracks which could sever agricultural fields)
 - Pedestrian access to essential facilities impeded by minor traffic flows.
- 76) The assessment will be based on the severance results which will be presented in Chapter 16 (Transport Planning), combined with information from design drawings and identification of community facilities.
- 77) All community receptors will be assigned a High sensitivity. The criteria used to help determine the magnitude of severance effects on community receptors are shown in Table 14.1.

Table 14.1: Communities and Health Magnitude Criteria – Severance effects (DMRB, 2020)

Magnitude	Criteria
Major	Introduction (adverse) or removal (beneficial) of complete severance with no/full accessibility provision.
Moderate	Introduction (adverse) or removal (beneficial) of severe severance with limited / moderate accessibility provision.
Minor	Introduction (adverse) or removal (beneficial) of severance with adequate accessibility provision.
Negligible	Very minor introduction (adverse) or removal (beneficial) of severance with ample accessibility provision.
No Change	No loss or alteration of accessibility; no observable impact in either direction.

- 78) The full list of receptors considered in the assessment of severance effects will be presented in the Environmental Statement.

Demands on Tourism Accommodation

- 79) A conservative assumption will be applied that all non-home-based workers would reside within the Regional Community Assessment Area (RCAA). It is acknowledged that there is a small chance of workers choosing to take up accommodation closer to site in holiday cottages and B&Bs that ordinarily accommodate tourists. If workers stay long term, this could result in lower availability for tourists resulting in knock-on impacts on the tourism industry. However, given that construction is expected last

over a number of years, B&B accommodation is unsuitable for individuals working in shifts. B&B and holiday cottage accommodation are more expensive than ordinary rental properties and, over the construction period, workers are likely to feel the need for more social and recreational amenities provided in larger settlements; it is therefore reasonable to assume that workers will choose to distribute themselves throughout the remaining area of the RCAA.

- 80) The potential for construction workers to put pressure on demand for tourism accommodation will be assessed based on the estimated peak workforce.
- 81) The peak workforce will be compared against the available capacity or 'headroom' to determine whether effects are likely to be significant. The temporal aspect of magnitude (duration and frequency) will be taken into consideration in concluding on the significance of effects. Tourism accommodation effects will be considered within the context of tourism accommodation bed space stock within the RCAA. A conservative assumption will be applied that all non-home-based workers would reside within the RCAA.
- 82) The tourism accommodation sector will be assigned a High sensitivity. The criteria used to help determine the magnitude of effects on tourism accommodation are shown in Table 14.2.

Table 14.2: Communities and Health Magnitude Criteria – Tourism accommodation effects

Magnitude	Criteria
Major	Large, direct change to the availability of tourism accommodation (change in the context of these criteria means fewer bed spaces in tourist accommodation and reduction in capacity to serve the visitor economy).
Moderate	Medium, direct change to the availability of tourism accommodation.
Minor	Small, direct change to the availability of tourism accommodation.
Negligible	Very slight change from the baseline condition.
No Change	Change hardly discernible, approximating 'no change' in conditions.

- 83) Please refer to Chapter 14.3 of the October 2019 Scoping Report for further details regarding the proposed communities assessment criteria.

14.4 Proposed Health Methodology

- 84) Please refer to Chapter 14.4 of the October 2019 Scoping Report for further details regarding the proposed health methodology.

14.5 Proposed Health Assessment Criteria

- 85) Please refer to Chapter 14.5 of the October 2019 Scoping Report for further details regarding the proposed health assessment criteria.

14.6 Existing Conditions

Assessment Area

- 86) The boundaries of the communities will be established using the smallest geographical unit at which population statistics can be gathered. In some cases, the community boundaries could extend further than the LCAA 1 km boundary. Professional judgement will therefore be applied to extend or reduce the LCAA where required, due to, for example, known environmental effects or the extent of transport routes.

Socio-economic characteristics

- 87) As part of scoping, an initial desk based study has been undertaken to review the key socio-economic characteristics of the area. This initial desk study helps to understand the potential receptors close to

the Proposed Marl Hill Section and identify the potential for significant effects to arise. The LCAA is located entirely within Ribble Valley Borough Council.

- 88) Please refer to Chapter 14.3 of the October 2019 Scoping Report for further details regarding the proposed Communities assessment criteria.

14.7 Potential Effects

- 89) Given the predominantly rural nature of the communities there is potential for disturbance effects, severance effects and effects on tourism and accommodation. These will therefore be considered further in the Environmental Statement.
- 90) Please refer to Chapter 14.7 of the October 2019 Scoping Report for further details regarding the potential effects.

14.8 Mitigation

- 91) Please refer to Chapter 14.8 of the October 2019 Scoping Report for further details regarding mitigation.

14.9 Summary Scope for the EIA

- 92) Table 14.3 below identifies the key socio-economic receptor groups and the reasons for scoping them in or out. This is an update of Table 14.5 from the original Scoping Report as some receptor groups have now been scoped back in due to the changes in design.

Table 14.3: Scoping outcomes

Receptor Group	Outcome / potential effects	Location within assessment area	Comments
Employment and economy	Employment opportunities for local workforce. Economic opportunities for local suppliers. Disturbance to normal functioning affecting commercial performance.	LCAA & RCAA	Scoped out: Opportunities for employment for the local workforce, or opportunities for involvement from the local supply chain in construction is expected to be limited in scale. Scoped in: Potential disturbance and severance effects on commercial properties within the LCAA.
Tourism	Use of tourist accommodation by construction workforce Disturbance to normal functioning of tourist attractions.	RCAA	Scoped in: Potential for construction workers to put pressure on demand for tourism accommodation.
Social infrastructure (e.g. hospitals, doctors' surgeries, aged care facilities, places of worship, emergency services, schools,	Disturbance to normal functioning affecting community cohesion.	LCAA	Scoped in: During construction, increase in traffic, noise or air quality and visual effects could result in disturbance to social infrastructure. Therefore disturbance effects on social infrastructure are scoped in.

Receptor Group	Outcome / potential effects	Location within assessment area	Comments
post offices, open space and recreation areas)			
Population and residential properties	Disturbance to normal functioning affecting quality of life. Community severance from increased traffic.	LCAA	Scoped in: Disturbance effects on communities as a result of traffic, noise, air quality and visual effects are scoped into the assessment. Similarly, severance effects for residential receptors are scoped into the ES. Potential effects will be assessed and recorded in the Environmental Statement.
Agricultural land / crops, livestock and farms.	Temporary or permanent loss of agricultural land. Disturbance to normal functioning of farms and landholdings	LCAA	Scoped in: Construction could result in disturbance effects for agricultural properties. Construction would be undertaken in a manner that minimises, as far as practicable, the potential effects on the normal functioning of farms and landholdings. Potential effects will be assessed and recorded in the Environmental Statement. Scoped out: All land would be reinstated post-construction.

93) Please refer to Chapter 14.9 of the October 2019 EIA Scoping Report for the Summary Scope for the EIA.

17. Noise and Vibration

17.1 Overview

- 94) Please refer to Chapter 17.1 of the October 2019 Scoping Report for the overview of the Noise and Vibration scoping assessment.

17.2 Proposed Methodology

- 95) The assessment will be undertaken using the latest DMRB Guidance (2019)⁴. The updated DMRB guidance provides a method for assessing construction noise and vibration which is broadly consistent with that in BS5228-1. This was not included in the earlier version of the standard and, as a result, it was therefore not included in the original Scoping Report.
- 96) Please refer to Chapter 17.2 of the October 2019 Scoping Report for further details regarding the proposed methodology.

17.3 Proposed Assessment Criteria

- 97) The updated DMRB guidance provides an approach to determining impacts during construction of road schemes. The approach is broadly consistent with that in BS5228-1, but does provide a more simplified method, defines Lowest Observed Adverse Effect Level (LOAELs) and Significant Observed Adverse Effect Level (SOAELs) and the impact classifications. As a result, the criteria below will be used when conducting the impact assessment.

Airborne Noise

- 98) Noise impact thresholds for construction activities at residential properties, and other noise-sensitive receptors, as presented in presented in Table 17.3, have been classified using the assessment approach set out in Annex E.3 of BS5228-1:2009 + A1:2014.
- 99) In relation to construction noise, daytime is 07:00 to 19:00, evening is 19:00 to 23:00 and night is 23:00 to 07:00. The level provided for the daytime is for the entire period, whereas that for evening and night is applicable to any single hour within the respective period.
- 100) The threshold values presented in Table 17.3 relate to the site noise level, which is the noise from construction activities alone.

Table 17.3: Construction noise LOAEL and SOAEL values at residential receptors (construction noise only)

Construction Airborne Noise Effect Level	Threshold Value (LAeq,T) 1m in front of the relevant façade	Source
Lowest Observed Adverse Effect Level (LOAEL)	Exceeds existing L _{Aeq,T} noise level for day, evening or night.	LOAEL is set at a level where construction noise becomes the dominant source.
Significant Observed Adverse Effect Level (SOAEL)	Threshold level determined as per BS 5228-1:2009+A1:2014 Section E3.2 and Table E.1.	Based on BS 5228-1:2009+A1:2014 and follows approach promoted within DMRB LA111.

- 101) In order to determine the significance of effects (see Table 17.2 of the October 2019 Scoping Report), the magnitude of airborne noise change due to construction will be defined using the criteria presented in Table 17.4.

⁴ Design Manual for Road and Bridges, Volume 11 Section 3 Part 7 'Noise and Vibration' (DMRB LA111), 2019

Table 17.4: Magnitude of impact and construction noise descriptions

Magnitude of change	Criteria
Major	Above or equal to 'SOAEL+5dB'.
Moderate	Above or equal to SOAEL and below 'SOAEL+5dB'.
Minor	Above or equal to LOAEL and below SOAEL.
Negligible	Below LOAEL.

Groundborne Noise

- 102) The impact classification criteria presented in Table 17.7 and 17.8 shall be used in the assessment of groundborne noise and vibration impacts at residential receptors and buildings during construction.
- 103) The significance criteria for groundborne noise levels arising from underground construction has been determined using criteria from the Elizabeth Line project (formerly known as Crossrail). Table 17.7 summarises the criteria and indicates that the effect would be considered potentially significant if groundborne noise levels exceed 40dB LAmax,S.
- 104) Effect levels in terms of NPSE have been added to the table based on the 40dB LAmax,S being considered as the LOAEL, and 45dB LAmax,S the SOAEL.

Table 17.7: Groundborne noise impact criteria for residential receptors

Impact Classification	Groundborne sound level dB LpASmax, (measured indoors, near the centre of any dwelling room on the ground floor)
No change	<35
Negligible	35 - 39
Minor	40 - 44
Moderate	45 - 49
Major	>49

Construction traffic

- 105) A classification for the magnitude of changes in road traffic noise is provided in DMRB LA 111. For construction road traffic noise, the classification of magnitude of change is reproduced from DMRB LA 111 in Table 17.8.

Table 17.8: Magnitude of impact at receptors (short-term) (reproduced from DMRB LA 111)

Magnitude of impact	Increase in Basic Noise Level of closest public road used for construction traffic (dB)
Major	Greater than or equal to 5.0
Moderate	3.0 to 4.9
Minor	1.0 to 2.9
Negligible	Less than 1.0

- 106) Construction noise and construction traffic noise shall constitute a significant effect where it is determined that a Major or Moderate magnitude of impact will occur for a duration exceeding either:
 - Ten or more days or nights in any 15 consecutive days or nights or
 - A total number of days exceeding 40 in any six consecutive months.

Operational traffic

- 107) It is not currently known whether any impacts would result from operational traffic (due to changes in the highway designs, for example). However, if these impacts are expected then they will be assessed using the criteria as set out in DMRB LA 111.
- 108) DMRB LA 111 states the following with regard to vibration from road traffic noise, which is therefore not included within the scope of this assessment:

'Operational vibration is scoped out of the assessment methodology as a maintained road surface will be free of irregularities as part of project design and under general maintenance, so operational vibration will not have the potential to lead to significant adverse effect'.

17.4 Existing Conditions**Baseline noise and vibration conditions**

- 109) Due to the Covid-19 Pandemic, changes to the baseline sound level monitoring will be required. Firstly, it was concluded last year that it was potentially unsafe and inappropriate to enter private properties for the purpose of noise surveys. It was also noted that noise survey data was likely to be unrepresentative of typical conditions (owing to reduced traffic flows, for example) and therefore unsuitable for use in the assessment. Guidance on this matter, issued by The Institute of Acoustics (IOA) and Association of Noise Consultants (ANC)⁵ on the 24 March 2020, has been followed.
- 110) After a review of the available options, and considering the guidance given by the IOA/ANC, the following approach to defining baseline conditions along the route of the scheme will be taken:
- Measured baseline sounds will be used where available
 - Where measured levels are unavailable, a review of online sources will be made to identify indicative sound levels (road and rail: extrium⁶ and previous local surveys, for example)
 - Where measured levels are unavailable and online sources do not provide indicative levels, conservative assumptions shall be made, which will likely result in low noise thresholds being adopted for construction noise assessment (i.e. the 65, 55 and 45 dB(A) day, evening and night thresholds presented within BS 5228 part 1).
- 111) Full details of this approach, including the limitations and uncertainties, will be presented in the Environmental Statement.
- 112) Please refer to Chapter 17.4 of the October 2019 Scoping Report for further details regarding existing conditions.

17.5 Potential Effects

- 113) Please refer to Chapter 17.5 of the October 2019 Scoping Report for further details regarding potential effects.

17.6 Design and Mitigation

- 114) Please refer to Chapter 17.6 of the October 2019 Scoping Report for further details regarding design and mitigation.

⁵ <https://www.association-of-noise-consultants.co.uk/wp-content/uploads/2020/03/Joint-Guidance-On-the-Impact-of-Covid.IOA-ANC-V2.pdf> accessed July 2020

⁶ www.extrium.co.uk accessed July 2020

17.7 Summary Scope for the ES

- 115) The information provided in this chapter of the Scoping Addendum is to provide an update to the changes in baseline and technical guidance. Further scoping information should be obtained from Chapter 17 of the October 2019 Scoping Report.

18. Air Quality and Climate Change

18.1 Overview

- 116) The October 2019 Scoping Report assumed that the main air quality impacts would be from road traffic. The need for the assessment of emissions from diesel generators, which may need to be used to power the tunnel boring machines (TBMs), other plant and equipment and site facilities has also subsequently been highlighted. Therefore, this chapter presents the outcome of the scoping exercise in relation to the likely significant air quality effects of the Proposed Marl Hill Section based on the consideration of emissions from diesel generators. Other changes to the original scope or assessment of road traffic emissions are also discussed where these have occurred.
- 117) Chapter 18.1 of the October 2019 Scoping Report highlighted the main pollutants of concern were primarily oxides of nitrogen (NO_x), nitrogen dioxide (NO₂) and particulate matter (PM₁₀ and PM_{2.5}). Due to the emissions from on-site diesel generators, carbon monoxide (CO), sulphur dioxide (SO₂) and ammonia (NH₃) have also been included within the air quality assessment.
- 118) Following feedback received in the original scoping decisions for the Proposed Programme of Works, further consideration is given in this chapter to the climate change agenda and carbon emissions.
- 119) As part of the original scoping exercise, a data review and desk study of the Proposed Marl Hill Section was undertaken to establish existing air quality. This has not been updated as the baseline conditions remain similar to those previously reported and do not influence or alter the assessment scope and methodologies.
- 120) The competent body for air pollution control and management on the Proposed Marl Hill Section is Ribble Valley Borough Council.

18.2 Proposed Methodology

- 121) The following section describes the proposed approaches for assessing air quality impacts arising from road traffic exhaust emissions and on-site generator emissions where these have changed or have been included since the October 2019 Scoping Report. Consideration is also given to the climate change agenda.
- 122) The methodology to assess fugitive dust from construction areas has not changed since the October 2019 Scoping Report.

18.2.1 Exhaust Emissions from Construction Vehicles

- 123) The assessment methodology for road traffic-related emissions will be defined based on the updated DMRB Guidance (2019)⁷ which was released subsequent to the October 2019 Scoping Report. The DMRB criteria, as outlined in Section 18.2.2 of the October 2019 Scoping Report, will continue to be used to determine the extent of the air quality Affected Road Network (ARN) (i.e. the assessment area for road traffic emissions).

18.2.2 Diesel Generator Emissions

- 124) Current estimates of the on-site energy usage and energy availability now indicate that it will be necessary to use diesel generators in each key compound. Environment Agency Guidance (2016)⁸ for the assessment of industrial emissions will be used to assess the impact of emissions from on-site generators. Generator specification data from generator suppliers will be used to estimate emissions assuming that they operate for a full year on a 24/7 basis for NO_x, SO₂, CO, NH₃ and particulate matter. Each generator will be modelled as a point source using ADMS, using five years of meteorological data, for ecological receptors up to 10 km from the diesel generators for European ecological sites and 2 km

⁷ Standards for Highways (2019) *Design Manual for Road and Bridges, 'Air Quality' (DMRB LA105)*. [Online] Available from: <https://www.standardsforhighways.co.uk/prod/attachments/10191621-07df-44a3-892e-c1d5c7a28d90> [Accessed: September 2020].

⁸ Environment Agency (2016) *Air Emissions Risk Assessment for your Environmental Permit*. Available from: <https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit> [Accessed: September 2020].

for other sites (including those defined for the ARN for road traffic and locally designated ecological sites).

- 125) Locations where people could be affected (i.e. residential properties, schools, hospitals and other publicly-accessible locations where exposure to air pollutants may occur) will be modelled for NO₂, SO₂, CO, NH₃ and particulate matter (PM₁₀ and PM_{2.5}). These locations will be selected to represent the nearest locations to the construction compounds containing diesel generators or close to the road network where a combined impact from diesel generator and road traffic emissions could occur. Ecological sites will be modelled for NO_x, SO₂ and NH₃. Concentrations will be modelled for 15 minute, 1-hour, 8-hour, 24-hour and annual averages as appropriate for the relevant pollutant air quality standards (refer to Table 18.1 in the October 2019 Scoping Report and also Table 18.1 in this report for the additional pollutants). The impact from the generator emissions, and where appropriate, road traffic emissions (referred to as the Process Contribution (PC)) will be assessed. The PC is the estimated maximum environmental concentration of substances due to releases from the process alone. The PC will also be combined with background concentrations to provide the Predicted Environmental Concentration (PEC) of the substances of interest as appropriate.
- 126) For ecological sites, deposition calculations will be undertaken for acid deposition and nitrogen deposition as appropriate.
- 127) Where traffic levels on road links close to human or ecological receptors do not trigger the DMRB scoping criteria (i.e. are not part of the ARN), the impact of generator and road traffic will still be modelled to assess the combined impact of both road traffic and generator emissions. This will ensure the maximum PEC at each receptor will be determined.

18.2.3 Assessment of impacts

- 128) The predicted pollutant concentrations at each receptor will be added to the relevant Defra background map values⁹ or Air Pollution Information System (APIS) background concentration data¹⁰ (for NH₃) to derive total concentrations.
- 129) Results will be compared with Air Quality Objectives (AQOs) and EU Limit Values to assess any potential exceedances; the significance of the associated impact will be based on the significance criteria in the DMRB LA105 guidance.

18.2.4 Greenhouse Gas Emissions and Climate Change Resilience

- 130) Climate change and the resultant shifts in weather patterns have the potential to significantly impact United Utilities' operations when hazards such as droughts, floods, storms or heatwaves become more frequent and more intense. United Utilities has first-hand experience of the impacts of extreme weather events on its operations and customers; United Utilities knows it needs to adapt its service to a changing climate, and has a part to play in mitigating climate change. At a corporate level, the company has developed a climate change mitigation strategy and made six pledges to reduce its carbon footprint.
- 131) It has been previously stated that once operational, HARP would transfer treated water from its source to supply points in Cumbria, Lancashire and Greater Manchester under the influence of gravity along its entire length. There would be no requirement for energy-consuming pumping plant or machinery under normal day-to-day operating conditions, and consequently no significant carbon emissions associated with treated water supply. It is acknowledged however that HARP would give rise to direct and indirect carbon emissions associated with the enabling works, construction activities, materials, and commissioning of the infrastructure before it enters use. Main sources of carbon emissions would include transport and road haulage, the use of diesel generating sets at the construction compounds, and concrete and steel production. It is expected that the resulting carbon emissions should therefore be estimated (and assessed within the Environmental Statement) and proposals to minimise these emissions will be encouraged.

⁹Defra (2020), *Background Mapping data for local authorities*, Background Maps 2018 and 2001 [online] available from: <https://uk-air.defra.gov.uk/data/laqm-background-home>.

¹⁰Air Pollution Information System (2020), [online], available from: <http://www.apis.ac.uk/>.

- 132) In order to mitigate potential carbon emissions and address the climate agenda, United Utilities would implement its climate change mitigation strategy. It is anticipated that the most effective intervention on HARP would be in the supply chain. United Utilities is therefore proposing to embed carbon and climate agenda-related requirements in the procurement process for consortia seeking to finance, design, build and maintain HARP. While still in development it is intended that these procurement requirements will be a mandatory part of the tendering process, and will be carried forward into the contract requirements for the newly-appointed consortia.

18.3 Proposed Assessment Criteria

- 133) Highways England's LA 105 defines how the significance of annual mean concentrations of NO₂ and PM₁₀ from road traffic can be reported. The approach identifies and assesses sensitive 'receptors' near roads where air quality might be adversely affected. Consequently, areas where AQOs are already exceeded, or are close to being breached (such as AQMAs), are considered. This will be expanded to include the other pollutants relevant to the emissions from generators which also have annual mean air quality standards (e.g. PM_{2.5} and NH₃). For short-term concentrations, which are relevant to emissions from the diesel generators, the significance of the predicted changes in pollutant concentrations (i.e. for NO₂, PM₁₀, CO, SO₂, and NH₃) is proposed to be determined in accordance with the relevant approach in the Environmental Protection UK / Institute of Air Quality Management (EPUK / IAQM) guidance¹¹.
- 134) The additional Air Quality Objectives (AQOs), EU Limit Values and Environmental Assessment Levels which are relevant to the assessment at human receptors following the consideration of diesel generator emissions are defined in Table 18.1 below.

Table 18.1: Air Quality Objectives (AQOs)/EU Limit Value/Environmental Assessment Levels

Pollutant	Threshold Concentration (µg/m ³)	Averaging Period
Oxides of nitrogen (NO _x)	75	Maximum 24-hour mean for the protection of vegetation (referred to as the "critical level").
Sulphur dioxide (SO ₂) (human health)	125	24-hour mean (99.18 th percentile)
	350	1-hour mean (99.73 rd percentile)
	266	15-minute mean (99.9 th percentile)
Sulphur dioxide (SO ₂) (ecological receptors)	10	Annual mean limit value for the protection of vegetation (referred to as the "critical level") where lichens or bryophytes are present.
	20	Annual mean limit value for the protection of vegetation (referred to as the "critical level") where lichens or bryophytes are not present.
Ammonia (NH ₃) (human health)	180	Annual Mean
	2500	Maximum hourly mean
Ammonia (NH ₃) (ecological receptors)	1	Annual mean limit value for the protection of vegetation (referred to as the "critical level") where lichens or bryophytes are present

¹¹ Environmental Protection UK and Institute of Air Quality Management (2017) *op. cit.*

Pollutant	Threshold Concentration ($\mu\text{g}/\text{m}^3$)	Averaging Period
	3	Annual mean limit value for the protection of vegetation (referred to as the "critical level") where lichens or bryophytes are not present

- 135) With regard to concentrations and deposition for international and national ecological sites, the Environment Agency guidance states emissions can be described as insignificant and no further assessment is required (including the need to calculate PECs) if:
 - The short-term PC is less than 10 % of the short-term critical level
 - The long-term PC is less than 1 % of the long-term critical level/critical load.
- 136) Where the long-term PC is above 1 %, further consideration of existing background concentrations or deposition rates is required, and where the total concentration or deposition is less than 70 % of the critical level or critical load (critical loads will be taken from APIS or provided by the scheme ecologists), calculated in combination with other committed projects, the emission is not likely to have a significant effect.
- 137) Where the long-term PC is above 1 %, and the total concentration or deposition rate is greater than 70 % of the critical level or critical load, either alone or in combination with other committed projects or developments, then this may indicate a significant effect and further consideration is likely to be required.
- 138) Where the short-term PC is above 10 % of the critical level then an assessment would be made of the PEC and if the PEC exceeds the critical level it would be regarded as potentially significant and would require further consideration.
- 139) With regard to concentrations at other ecological sites (e.g. ancient woods, local wildlife sites and national and local nature reserves), the Environment Agency guidance states emissions can be described as insignificant and no further assessment is required if:
 - The short-term PC is less than 100 % of the short-term critical level or
 - The long-term PC is less than 100 % of the long-term critical level/critical loads.
- 140) Where the contribution is above 100 %, either alone or in combination with other committed projects or developments, then this may indicate a significant effect and further consideration is likely to be required.
- 141) For ecological sites any potentially significant impacts will be passed to the scheme ecologists to determine their significance and where practicable, mitigation will be proposed.

18.4 Existing Conditions

- 142) As noted in Section 18.1, there are no changes to the October 2019 Scoping Report in relation to existing conditions which affect the assessment scope and methodologies.

18.5 Potential Effects

- 143) The diesel generator emissions during the construction phase have the potential to impact on human receptors and designated ecological sites.
- 144) There are no further changes to the October 2019 Scoping Report in relation to potential effects.

18.6 Summary Scope for the ES

145) Table 18.3 below summarises the outcome of the scoping exercise and indicates which potential air quality effects have been scoped into and out of the EIA (the table shows only those changes or additions to the October 2019 Scoping Report).

Table 18.3: Summary of Scoping Exercise

Receptor Group	Matter / Potential Effects	Location Within Assessment Area	Comments
Human receptors	Diesel generator exhaust emission – construction	Generally, those which are closest to the construction compounds containing diesel generators and within 2 km.	Scoped in
Ecological receptors (European designated sites)	Diesel generator exhaust emission – construction	Within 10 km of diesel generators.	Scoped in
Ecological receptors (Other designated ecological sites)	Diesel generator exhaust emission – construction	Within 2 km of diesel generators.	Scoped in
National / global level	Greenhouse gas emissions - construction	Emissions from embedded carbon for construction materials, generators and transport of construction materials.	Scoped in
National / global level	Greenhouse gas emissions - operation	Service vehicles only – no other envisaged emissions.	Scoped out. The Proposed Marl Hill Section is a gravity-fed aqueduct and therefore has negligible carbon emissions during its operational phase.
National / global level	Climate change resilience - operation	Regional level – Haweswater Aqueduct.	Scoped in, to address the resilience of the proposed infrastructure to climate change

Appendix A. Minor Scoping Changes

Environmental Topic	Methodology	Assessment Criteria	Existing Conditions	Summary Scope
Chapter 6: Landscape and Arboriculture	Baseline surveys will now be undertaken in Summer (as well as Winter) in the same manner as described in Chapter 6.2 of the October 2019 EIA Scoping Report.	No change	No change	No change
Chapter 7: Water Environment	<p>For assessing impacts upon water quality, water quantity (excluding flood risk covered in Chapter 8 and water resources where applicable) the criteria from the Design Manual for Roads and Bridges (DMRB) LA 113 Road Drainage and the Water Environment (hereafter referred to as LA 113) has been used.</p> <p>GWDTE</p> <p>It is anticipated that not all Ground Investigation (GI) and subsequent assessment activities will be completed in advance of the planning application. Therefore, it is proposed that the groundwater impact assessment uses the GI information that is available, which would be supported by the desk-based study.</p> <p>After meeting with the Environment Agency, the following approach to the GWDTE assessment has been agreed:</p> <ul style="list-style-type: none"> • Conduct an initial high-level screening exercise, using Phase 1 Habitat Survey data, to identify sites which are groundwater dependent • Use National Vegetation Classification (NVC) surveys, high-level NVC surveys, and surveys that follow the Scotland & Northern Ireland Forum for Environmental Research (SNIFFER) WFD95 Wetland Typology methodology. The UK TAG guidance links the NVC classification to indicative ranges of groundwater • Develop Individual Conceptual Site Models (CSMs) for the refined list of potential GWDTEs. The prioritisation of GWDTEs will then be derived by considering both the ecological designation of the site, and the degree of groundwater dependency of each GWDTE. <p>The impact assessment will then be determined using the CSM to project anticipated impact(s) on groundwater flows, levels and quality at the site, because of a given works item.</p> <p>Surface Water Hydrology</p> <p>Surface Water Hydrology has been assessed as part of the Flood Risk chapter and will be reported in Chapter 8 going forward.</p>	-	-	<p>Potential Effects</p> <p>Limited use of wet concrete and cementitious grout during shaft construction and tunneling – scoped out.</p> <p>The tunnel design has been confirmed as a deep-tunnel (i.e. 50 m plus), and therefore any impacts to surface waters or GWDTEs, along the length of the tunnel, have been Scoped Out from further assessment. Any impacts to surface waters or GWDTEs because of open-cut and compound related works remain Scoped In and these assessments will follow the methodology as described in this report.</p>
Chapter 8: Flood Risk	Detailed flood risk assessments will be undertaken of the proposed Ribble Crossing in the Clitheroe area. Baseline assessment has concluded that this Main River is in Flood Zone 3 indicating a high risk of flooding.	Will follow NPPF and Environment Agency guidelines. There will be consultation with the Environment Agency to establish bridge design and flood risk assessment parameters.	To be confirmed in the ES.	Presently being with the Environment Agency and other stakeholders.

Environmental Topic	Methodology	Assessment Criteria	Existing Conditions	Summary Scope
<p>Chapter 10: Cultural Heritage</p>	<p>The assessment will be undertaken using professional judgement, guided by DMRB LA 104 and LA 106 Cultural Heritage Assessment (Highways England 2020).</p> <p>Zone of Visual Influence (ZVI)</p> <p>Designated assets would be assessed within a zone of visual influence (ZVI) to assess any assets whose settings may be impacted.</p> <p>An initial ZTV would be created with a threshold of 6 km from the centre of each of the construction compounds to produce an overarching assessment area. The ZTV mapping and subsequent site appraisal work will illustrate that visibility would be principally concentrated within the surrounding landscape up to a distance of 3 km. Therefore, the detailed assessment area for landscape and visual receptors will extend up to a threshold of 3 km from each of the construction compounds.</p> <p>ZTVs would be prepared using digital terrain modelling (OS Terrain 5) and Geographical Information System (ArcGIS 10.6) base mapping. The ZTV would focus on the likely significant effect, a 45 m high crane, which would be in place for the full duration of the tunnelling activities. Therefore, the ZTV modelling will be undertaken for the full 45 m crane height above existing ground levels at the highest point at the proposed tunnel portals. GLVIA3 states that ZTV mapping should "assume that the observer height is between 1.5 m and 1.7 m above ground level". A height of 1.6 m above ground level will therefore be used to represent the eye level of an average height person.</p>	<p>Table 10.2 of the October 2019 Scoping Report illustrates the criteria which will be used to assess the value of historic buildings. As with all other listed buildings, Grade II Listed Buildings will now be assessed to a High (instead of a Medium) value, unless professional judgement determines that a Grade II Listed Building should be of a different value.</p>	<p><i>No change</i></p>	<p>For the Cultural Heritage chapter of the ES, a 200 m assessment area around the scheme will be used for a historic environment record (HER) search for non-designated heritage assets. Designated assets would be assessed within a zone of visual influence (ZVI), to assess any assets which may have their settings impacted on. Heritage assets will be assessed in accordance with the criteria presented in DMRB LA 104 and LA 106 and Historic England guidance.</p>
<p>Chapter 11: Soils, Geology and Land Quality</p>	<p>The UK approach to the assessment of contaminated land, as set out in Land Contamination: Risk Assessment (Environment Agency 2019), will be followed by the project. However, at the time of writing, it is anticipated that GI and subsequent assessment activities will not be completed in advance of the planning application. Therefore, it is proposed to undertake the Human Health Impact Assessment using a desk-based conceptual model approach.</p>	<p>For Table 11.1 in the October 2019 Scoping Report:</p> <ul style="list-style-type: none"> ▪ In the 'Very High' sensitivity, the receptor example <i>Schools and playing fields, children's nurseries, nursing homes or residential homes for the elderly</i> is replaced by <i>Residential Gardens and allotments</i>. ▪ In the 'High' sensitivity the receptor example <i>Residential Gardens and allotments</i> is replaced by <i>Residential without gardens, schools and playing fields, children's nurseries, nursing homes or residential homes for the elderly</i>. <p>Soil Quality</p> <p>The following information was omitted in the original Scoping Report; however, it is considered to be relevant to conduct the Soils, Geology and Land Quality Impact Assessment:</p> <p>The economic resource value of soil is primarily measured by its ability to support agricultural uses. This is quantified by its ALC grade, with six grades defined within Agricultural Land Classification (ALC) for England and Wales: Revised criteria for grading the quality of agricultural land (Ministry of Agriculture, Fisheries and Food, 1988), as follows:</p> <ul style="list-style-type: none"> ▪ Grade 1 (excellent quality) ▪ Grade 2 (very good quality) 	<p>Publicly available information does not identify Mineral Safeguarding Areas within the area of search. Consultation will be undertaken with local authority mineral officers to confirm this.</p>	<p>No change</p>

Environmental Topic	Methodology	Assessment Criteria	Existing Conditions	Summary Scope
		<ul style="list-style-type: none"> ▪ Subgrade 3a (good quality) ▪ Subgrade 3b (moderate quality) ▪ Grade 4 (poor quality) ▪ Grade 5 (very poor quality). <p>BMV agricultural land equates to Grades 1 and 2 and Subgrade 3a of the ALC system and is the most flexible land in terms of the range of crops that can be grown, the level and consistency of yield and the cost of obtaining yield.</p> <p>Soils could be affected in several ways during stripping, handling and storage, including:</p> <ul style="list-style-type: none"> ▪ Deformation through compaction and smearing arising from trafficking and handling of the soils ▪ Mixing of topsoils and subsoils or soils with distinctly different properties, leading to a degradation of soil quality ▪ Biological, chemical and physical changes during storage due to natural compaction and anaerobic conditions arising in the core of the stockpile, although these would be largely reversible upon reinstatement." <p>The sensitivity of receptors will be defined in four categories ('Very High', 'High', 'Medium' or 'Low').</p>		
<p>Chapter 12: Materials</p>	<p>Table 12.1 from October 2019 Scoping Report should instead show the unit of measurement in cubic metres (m³), rather than in tonnes.</p>	<p>The following local planning policy documents and regulations are relevant to the assessment of materials and waste:</p> <ul style="list-style-type: none"> ▪ Cumbria Minerals and Waste Local Plan (September 2017) ▪ Lancashire Minerals and Waste Local Plan (2013) Joint Lancashire Minerals and Waste Local Plan ▪ Yorkshire Dales National Park Authority (2016) Yorkshire Dales National Park Local Plan 2015-2030. 	<p>No change</p>	<p>No change</p>
<p>Chapter 13: Public Access and Recreation</p>	<p>The assessment will be undertaken using professional judgement, guided by DMRB GG 142 Walking, cycling and horse-riding assessment and review (formerly HD 42/17) (Highways England 2020). Full details of these regulations will be provided in the ES.</p>	<p><i>No change</i></p>	<p>Additional consultation to be undertaken with non-motorised user groups.</p>	<p>No change</p>
<p>Chapter 16: Transport Planning</p>	<p>Baseline Information Sources</p> <p>Due to the changes in traffic routes, resulting from all of the optioneering work which has been done, there are some highway routes without any background traffic surveys being undertaken. Therefore, the traffic count has been obtained from the Department for Transport¹² website in order to produce a full picture of the highway network. Due to this, ongoing contact has been made with Highways England to ensure that their requirements are still being met, such as junction capabilities, for example.</p>	<p><i>The haul routes to the Marl Hill Compounds have changed from the route described in the October 2019 Scoping Report. After an optioneering exercise which examined how the ES and Transport Assessment will be based on the following transport route solutions:</i></p> <p><u><i>Bonstone and Braddup compounds</i></u></p> <ul style="list-style-type: none"> ▪ Route 1 for Light Vehicles and HGVs under 3.5m in height, via A59, Pimlico Link Road, Chatburn Road, and B6478 Well Terrace/Waddington Road/Clitheroe Road/Slaidburn Road/Hallgate Hill ▪ Route 2 for HGVs over 3.5 m in height and abnormal loads, via A59, Pimlico Link Road, Chatburn Road, Clitheroe Road, Crow 	<p>No change</p>	<p><i>No change</i></p>

¹² <https://roadtraffic.dft.gov.uk/#/6/52.101/-4.641/basemap-regions-countpoints>

Environmental Topic	Methodology	Assessment Criteria	Existing Conditions	Summary Scope
		<p>Trees Brow, Ribble Lane, Grindleton Road, Waddington Road, West Bradford Road, Slaidburn Road, then B478 as per Route 1</p> <ul style="list-style-type: none"> ▪ Route 3, a dedicated, newly-constructed haul route referred to as the Ribble Crossing – refer to <i>Access to Braddup and Bonstone Compounds</i> in Section 3.5 above. 		