Haweswater Aqueduct Resilience Programme - Proposed Bowland Section

Environmental Statement

Volume 2 Chapter 14: Communities and Health

June 2021

Haweswater Aqueduct Resilience Programme - Proposed Bowland Section

Project No:	B2707CT
Document Title:	Proposed Bowland Section Environmental Statement Volume 2 Chapter 14: Communities and Health
Document No.:	LCC_RVBC-BO-ES-014
Revision:	0
Date:	June 2021
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14. Communities and Health

14.1 Introduction

1) This chapter, in conjunction with Appendix 14.1, comprises an assessment of the likely significant effects of the Proposed Bowland Section on communities and health.

2) The report begins by reviewing the legislation and guidance relevant to communities and health. The assessment area and methodology for the assessment are then outlined. The nature, value and sensitivity of the existing baseline environment are then identified before an assessment is made of the potential effects on communities and health. Embedded and good practice mitigation measures relevant to communities and health are summarised in Section 14.4 and have been taken into account in the assessment in Section 14.6.

3) The assessment areas for potential community effects in the vicinity of the Proposed Bowland Section are defined by local and regional communities:

- The Regional Community Assessment Area (RCAA) considers local authority areas within 1 km of the proposed development boundary. For the purposes of this assessment the RCAA is defined as the combined Lancaster City Council and Ribble Valley Borough Council administrative areas, incorporating indicative corridors for traffic routes. The RCAA boundary is presented in Figure 14.1.
- The Local Community Assessment Areas (LCAA) encompass parishes located within a 1 km boundary centred on the two compound areas of the Proposed Bowland Section. The LCAA is taken into account in the assessment of potential community effects, and may extend beyond the planning application boundaries. Community and health effects are not assessed for the corridor below which the tunnel would pass, as most works associated with the tunnels would be located underground and would have minimal or no impacts at surface level. The LCAA boundary and community areas can be seen on Figure 14.2.

4) The assessment of the Proposed Bowland Section focuses on four communities: Newton-in-Bowland,[1] Tatham, Roeburndale, and Wray with Botton. The boundaries of the communities have been established using the smallest geographical unit at which population statistics can be gathered.[2] As noted above, the community boundaries generally extend further than the LCAA 1 km boundary. Professional judgement has therefore been applied to extend or reduce the community assessment area where required due to, for example, known environmental effects or the extent of traffic haulage routes.

5) The chapter is presented under the following subheadings:

- Disturbance Effects (assessed for the LCAA)
- Severance Effects (assessed for the LCAA)
- Tourism Accommodation Effects (assessed for the RCAA)
- Health Effects (assessed for the RCAA, presented in full in Appendix 14.1: Health Assessment and summarised in this chapter).

6) The chapter is supported by the following technical appendices and figures:

- Appendix 14.1: Health Assessment
- Figure 14.1: Regional Community Assessment Area (RCAA) Boundary
- Figure 14.2: LCAA Boundary and Community Areas
- Figure 14.3: Community and Health Receptors.

[1] The Newton-in-Bowland community area contains two compounds, one related to the Proposed Bowland Section and one related to the Proposed Marl Hill Section.

[2] Office of National Statistics ONS (2020) *Administrative Geography – England.* https://www.ons.gov.uk/methodology/geography/ukgeographies/administrativegeography/england [Accessed May 2021]

14.2 Scoping and Consultations

14.2.1 Scoping

7) A communities and health chapter was included within the EIA Scoping Report[3], which was submitted to the relevant planning authorities for comment in October 2019, followed by a Scoping Addendum in February 2021 due to design changes and refinements. Lancaster City Council and Ribble Valley Borough Council published their respective Scoping Opinions on both these reports in 2020 and 2021, and these have been incorporated into the assessment. Scoping comments and responses are outlined in Appendix 4.1.

8) The elements scoped into the assessment of effects on communities and health for the Proposed Bowland Section are summarised in Table 14.1.

Table 14.1: Summary of Scope for the Assessment of Effects on Communities and Health

Assessment Element	Overview	Scope
Disturbance effects	Where environmental effects arising from the Proposed Bowland Section (air quality, noise, landscape and visual, and traffic) could result in disturbance to, or affect the functioning of, the community receptors.	• Residential properties • Social infrastructure • Commercial operations • Agricultural activities.
Severance effects	Where the Proposed Bowland Section could result in severance of access to the community receptor or could disrupt access to community facilities.	• Residential properties • Social infrastructure • Commercial operations • Agricultural activities.
Tourism accommodation effects	Where the presence of construction workers in the community could create demand for tourism accommodation that could place pressure upon supply for visitors.	Tourism accommodation (hotels, bed and breakfasts, guest houses).
Health effects	Where environmental effects arising from the Proposed Bowland Section could have consequences for the health and well-being of residents of the community.	The affected population.

14.2.2 Consultation

9) During the course of this assessment, consultation has taken place with relevant statutory and non-statutory consultees, stakeholders and third parties, through both email correspondence, telephone calls, and face-to-face meetings.

14.3 Key Legislation and Guidance

10) Table 14.2 introduces legislation and guidance that are relevant to the communities and health assessment.

Table 14.2: Communities and Health Legislation and Guidance

Legislation and Guidance	Description
Design Manual for Roads and Bridges (DMRB): *LA 112*	The DMRB sets out the requirements and advice relating to works on motorway and all-purpose trunk roads. DMRB *LA 112 Population and Human Health* sets out the requirements for assessing and reporting the environmental effects on population and

[3] Jacobs (2019) Haweswater Aqueduct Resilience Programme Proposed Bowland Section - EIA Scoping Report

Legislation and Guidance	Description
Population and Human Health[4]	health from construction, operation, and maintenance of highways projects. Whilst the DMRB guidance primarily relates to highways, the principles and methodology can be applied to all linear infrastructure.
Public Health England Strategy 2020 to 2025[5]	The strategy for public health in England sets out the government's long-term vision for the future of public health in the country. It aims to create a 'wellness' service and to strengthen both national and local leadership. It adopts the Marmot Review's[6] life course framework for tackling the social determinants of health and aims to support healthy communities.
Human health: Ensuring a high level of protection[7]	The reference paper for addressing human health in Environmental Impact Assessment (EIA) provides health authorities with a guide to the EIA Directive to assist in navigating the EIA process, as well as providing principles and good practice for proportionately addressing health in EIA.

11) National and local planning policies are covered in Chapter 5: Planning and Policy Context. Local and national health and well-being strategies are explained in Appendix 14.1: Health Assessment.

14.4 Assessment Methodology and Assessment Criteria

14.4.1 Assessment Methodology

12) This section describes the methodology for the assessment of community effects. The methodology for the assessment of effects on health is provided in Appendix 14.1: Health Assessment.

13) DMRB guidance *LA 112 Population and Human Health* standard[8] provided a partial basis for assessing community severance and health effects. However, in some cases, (e.g. for the assessment of community disturbance and tourism accommodation effects), there is no definitive guidance available and no prescribed method for either determining the sensitivity of community receptors or assessing the significance of effects on those receptors. This is especially the case in connection with community disturbance arising from construction vehicle movements. Jacobs therefore exercised reasonable care and professional judgement based on United Utilities' consultations with local affected communities, and an understanding of construction vehicle numbers and durations, for the assessment of such community disturbance.

14.4.2 Assessment Criteria

Disturbance Effects

14) For the purposes of this assessment, disturbance effects within the LCAA were considered to arise when a combination of two or more visual, traffic, air quality and noise effects coincided on a particular area or receptor. The assessment of disturbance effects considered community receptors within the LCAA, which comprised four community areas: Newton-in-Bowland, Tatham, Roeburndale, and Wray with Botton.

[4] Highways England (2020) *Design Manual for Roads and Bridges: LA 112 Population and Human Health*. Available at: https://www.standardsforhighways.co.uk/prod/attachments/1e13d6ac-755e-4d60-9735-f976bf64580a [Accessed: May 2020]
[5] Department of Health (2010) *Public Health England Strategy 2020 to 2025*. Available at: https://www.gov.uk/government/publications/phe-strategy-2020-to-2025 [Accessed May 2020]
[6] The Marmot Review into health inequalities in England was published on 11 February 2010. It proposes an evidence-based strategy to address the social determinants of health, the conditions in which people are born, grow, live, work and age and which can lead to health inequalities
[7] Cave, B., et al. (2020) *Human health: Ensuring a high level of protection*. A reference paper on addressing Human Health in Environmental Impact Assessment. As per EU Directive 2011/92/EU amended by 2014/52/EU. International Association for Impact Assessment and European Public Health Association. Available at: https://eupha.org/repository/sections/HIA/Human%20Health%20Ensuring%20Protection%20Main%20and%20Appendices.pdf [Accessed: 02-02-2021]
[8] Highways England (2020) *op. cit.*

15) For each community area, receptors were identified using Ordnance Survey AddressBase data, site surveys, Google imagery and stakeholder engagement. Receptors were classified into the following categories: residential properties, social infrastructure (e.g. schools, hospitals, GP facilities, village halls) and commercial operations (e.g. retail facilities, pubs, business parks). Community receptors can be seen on Figure 14.3.

16) For each receptor, assessment findings from each of the following topics were 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 and Climate Change.

17) Disturbance effects were assessed for individual receptors using professional judgement to determine whether the combination of topic effects could result in a significant disturbance effect overall for that receptor.

18) Overall disturbance effects are reported at a community level taking consideration of the various mitigation measures that have been proposed and the proportion of individual receptors experiencing disturbance effects compared to the total in the community.

19) In addition to disturbance effects associated with visual, traffic, air quality and noise factors within the LCAAs, further consideration was given to disturbance effects associated with general construction traffic using the local highway network *outside* the LCAAs. Once again, professional judgement was applied to evaluating the significance of community disturbance along haulage routes in the local area, taking into account community feedback received during consultation and engagement events. Settlements outside the LCAAs that would potentially be affected by one or more of the proposed haulage routes include Clitheroe, Waddington, West Bradford, Chatburn, Grindleton, Hornby-with-Farleton, Wennington and Bentham.

Severance Effects

20) The assessment of severance effects considers impacts on both severance and accessibility. Severance is defined as the extent to which members of communities are able to move (or impaired from moving) around their community to access services and facilities. Accessibility is defined as the ability of users to access land, property, infrastructure, businesses, and community facilities.

21) The assessment has drawn on the findings presented in Chapter 16: Transport Planning which considers severance because of the difficulty of crossing a heavily trafficked road, the road itself (as it creates a physical barrier) and pedestrian access to essential facilities impeded by minor traffic flows. Where 'slight', 'moderate' or 'substantial' severance is identified in Chapter 16: Transport Planning, the assessment has considered the implications for community receptors on access to community facilities.

22) The assessment presented in Chapter 16: Transport Planning does not differentiate between traffic associated with enabling or construction works, with impacts considered over the duration of the construction programme, assumed to be from 2023 to 2029. The peak of activity would be during the construction phase. Therefore, severance effects as a result of traffic flow, driver delay and pedestrian delay as well as impacts on local bus services are assessed for the construction phase only.

23) The assessment has also considered the ability of users to access land, property, infrastructure, businesses and community facilities, as a result of new infrastructure, road closures or delays imposed by traffic management measures. Any such changes to access have been informed by the Construction Traffic Management Plan (CTMP (LCC-BO-APP-007 and RVBC-BO-APP-007_01)).

24) All community receptors have been assigned a high sensitivity. The criteria used to help determine the magnitude of severance effects on community receptors are shown in Table 14.3.

Table 14.3: Magnitude Criteria for the Assessment of Community Severance Effects[9]

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

25) The sensitivity of receptors was assumed to be high and the magnitude of impact was established using the assessment criteria presented in Table 14.3 above. The matrix in Table 14.4 was then used to determine whether likely environmental effects are considered significant. For the purposes of this Environmental Statement (ES), any effect assessed to be of moderate or major significance is considered to be significant overall.

Table 14.4: Significance of Effects

		Magnitude			
		Negligible	**Minor**	**Moderate**	**Major**
Sensitivity	**Low**	Negligible	Negligible / slight	Slight / moderate	Moderate
	Medium	Negligible / slight	Slight	Moderate	Moderate / major
	High	Slight	Slight / moderate	Moderate / major	Major

Tourism Accommodation Effects

26) The potential for construction workers to put pressure on demand for tourism accommodation has been assessed based on the estimated peak workforce.

27) The peak workforce has been compared against the available capacity or headroom to determine whether effects would be likely to be significant. The temporal aspect of magnitude (duration and frequency) has been taken into consideration in concluding on the significance of effects, recognising that the 'peak' effect would endure for only a short period within the overall construction programme. Tourism accommodation effects are considered within the context of tourism accommodation bedspace stock within the RCAA, as seen on Figure 14.1. A conservative assumption has been applied that all non-home-based workers would reside in the RCAA; however, it is likely that workers would be more widely dispersed than the RCAA, and therefore any effects would be diluted across a wider assessment area.

28) The tourism accommodation sector has been assigned a high sensitivity. The criteria used to help determine the magnitude of effects on tourism accommodation are shown in Table 14.5.

[9] Highways England (2020) *op. cit.*

Table 14.5: Magnitude Criteria for the Assessment of Tourism Accommodation Effects

Magnitude	Criteria
Major	Large, direct change to the availability of tourism accommodation
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

Health Effects

29) The methodology for the assessment of effects on health is provided in Appendix 14.1: Health Assessment. The assessment identifies health determinants likely to be affected by the Proposed Bowland Section. Where significant residual effects are reported by other topics in this ES, the assessment has followed a source-pathway-receptor model to identify potential health effects. Reporting is generally directed to those effects for which is a clear pathway between the source and the receptor, and by using evidence to support the conclusions. In addition, EIA topics which have reported residual environmental effects which are not significant have also been considered in the health assessment, to allow the potential health outcomes of combinations of minor effects to be considered.

14.4.3 Embedded Mitigation and Good Practice

30) Embedded mitigation is inherent to the design, and good practice measures are standard industry methods and approaches used to manage commonly occurring environmental effects. Embedded mitigation and good practice of particular relevance to communities and health is set out under the subheadings below, and the assessment in Section 14.6 is made taking these measures into account.

31) As explained in the preceding section, this chapter is also informed by the findings of other topic chapters of this ES. The assessments in these chapters have also been made taking into account embedded mitigation and the good practice measures of relevance to their topic area.

32) The need for any topic-specific essential mitigation (generally for effects likely to be significant in the context of the EIA Regulations) is considered in Section 14.7 of this chapter.

Embedded Mitigation

33) Chapter 3: Design Evolution and Development Description explains the evolution of the design with input from the EIA team, including mitigation workshops and the use of Geographic Information Systems (GIS)-based constraints data. Consideration of potential community effects has been an integral part of the planning and design of the Proposed Bowland Section. Where practicable, compounds have been designed to minimise land take and effects on local communities.

Good Practice Measures

34) Good practice measures contained in Appendix 3.2: Construction Code of Practice (CCoP) include some of particular relevance to communities and health. Regular communication between the main Contractor and affected landowners, occupiers and agents could mitigate associated adverse community impacts that may otherwise arise from ongoing construction activities. As set out in Appendix 3.2, the contractor would:

- Take reasonable steps to engage with nearby residents, including those who may be detrimentally affected by construction activities. This would include distribution of timely communications to the community and stakeholders, providing advance information about the work in the area.
- Develop a Stakeholder and Customer Communications Management Plan, which would be regularly updated throughout the duration of work. The plan would set clear objectives and processes on how

the work would be delivered to mitigate impacts to customers, whilst striving to build stronger stakeholder relationships.

Assumptions and Limitations

35) Assumptions and limitations of the methodology are outlined as follows:

- AddressBase data, produced by the Ordnance Survey, has been used to identify community receptors. This has been verified where possible by desk-based reviews and site surveys; however, this data source may not be entirely up to date
- The assessment of community disturbance effects is reliant on the assessments presented in Chapter 6: Landscape and Arboriculture, Chapter 16: Transport Planning, Chapter 17: Noise and Vibration, and Chapter 18: Air Quality. The limitations and assumptions presented in these chapters are therefore relevant to the assessment of community disturbance effects
- To gather accurate data on population and demographics, community areas have been defined using Office for National Statistics (ONS) parish boundaries. In some cases, the naming of community areas may not reflect individual notions of communities or neighbourhoods. Where effects are experienced by a group of residents, for example on a particular street or group of streets, this is explicitly stated within the assessment
- A conservative assumption has been applied that all non-home-based workers would reside within the RCAA. It is acknowledged that there would be 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 stayed long term, this could result in a lack of availability for tourists, resulting in knock-on impacts on the tourism industry. However, given that construction is predicted to last over a year, B&B accommodation would be unsuitable for individuals working in shifts. B&B accommodation is more expensive than ordinary rental properties and, over the construction period, workers would be likely to feel the need for more social and recreative amenities provided in more urban areas. It is reasonable to assume that workers would choose to distribute themselves more widely than within the RCAA, therefore, any effects would be diluted across a wider assessment area.

14.5 Baseline Conditions

36) This section details the baseline community conditions within the RCAA and LCAA assessment areas. Baseline health data are included in Appendix 14.1: Health Assessment.

37) Baseline data were collated in compiling this assessment from the following sources:

- Field surveys completed on 10 December 2019
- Desk-based assessment (as summarised in Tables 14.6 to 14.10).

38) The description of baseline conditions has focused on the defined LCAAs. As already stated, transport routes are acknowledged as extending outside the LCAAs but for completeness have been considered as part of the scope of disturbance effects.

14.5.1 Information Sources

39) Key data sources used to inform the baseline include statistics published by the ONS,[10] the Ministry of Housing, Communities and Local Government,[11] AddressBase data provided by the Ordnance Survey,[12] and Tourism data from Visit Britain.[13]

[10] ONS (2021) Central Data Source. Available at: https://www.ons.gov.uk/ [Accessed: May 2020]
[11] Ministry of Housing, Communities & Local Government (MHCLG) (2019) *English Indices of Deprivation*. Available at: https://www.gov.uk/government/statistics/english-indices-of-deprivation-2019 [Accessed: May 2020]
[12] Ordnance Survey (2020) AddressBase Data. Available at: https://www.ordnancesurvey.co.uk/business-government/products/addressbase [Accessed: May 2020]
[13] Visit Britain (2016) *Accommodation Stock Audit*. Available at: https://www.visitbritain.com/gb/en [Accessed: May 2020]

14.5.2 RCAA Baseline Conditions

40) The RCAA is defined as the combined administrative areas of Lancaster City Council and Ribble Valley Borough Council. Baseline information related to these two administrative areas is provided in Table 14.6.

Table 14.6: RCAA Baseline Data

Indicator	Ribble Valley Borough Council	Lancaster City Council
Tourism assets[14]	A substantial part of the rural area of the authority is classified as part of the Forest of Bowland Area of Outstanding Natural Beauty. The Forest of Bowland is designated as an Area of Outstanding Natural Beauty covering 803 km^2. The natural environment serves tourist activities such as walking, cycling, stargazing, photography and 'family fun' events. Tourism receptors within Ribble Valley also include Clitheroe Castle Museum and Browsholme Hall, together attracting 43,000 visitors annually.[15]	Large sections of rural land in Lancaster City Council are covered by two Areas of Outstanding Natural Beauty: Forest of Bowland and Arnside / Silverdale. Tourism receptors include Lancaster Castle and City Museum, the Carnforth Station Heritage Centre, Leighton Hall and Williamson Park – Ashton Memorial, together attracting 184,000 visitors each year.[15]
Tourism accommodation[16]	Total bedspace stock in serviced accommodation in Ribble Valley in 2016 was 3,290. This includes hotels, guest houses and bed and breakfasts.	Total bedspace stock in serviced accommodation in Lancaster in 2016 was 4,880. This includes hotels, guest houses and bed and breakfasts.

14.5.3 LCCA Baseline Conditions

41) The LCCA includes the communities of Newton-in-Bowland, Roeburndale, Tatham, and Wray with Botton. Baseline conditions for these communities are set out in Tables 14.7 to 14.10 below.

Newton-in-Bowland

42) Newton-in-Bowland is characterised as a rural community area comprising approximately 87 residential properties, approximately 40 farms, a selection of tourism accommodation facilities including guest houses and bed and breakfasts (B&Bs), a village hall, and the Parkers Arms pub. The village of Newton-in-Bowland is the main hub of the community, located approximately 500 m east of the proposed Newton Compound. The baseline characteristics of Newton-in-Bowland are summarised in Table 14.7.

Table 14.7: Newton-in-Bowland Baseline Data

Indicator	Newton-in-Bowland
Population[17]	Usual resident population is 315.
Population density[18]	Population density is 0.10 people per hectare compared to 2.0 in the RCAA.

[14] OpenStreetMap Contributors (2020) *OpenStreetMap*. Available at: https://www.openstreetmap.org/ [Accessed: May 2020]
[15] Lancashire County Council (2020) *Visitor attendance in Lancashire 2019 and 2019/20*. Available at: https://www.lancashire.gov.uk/media/899052/visitorattendance.pdf [Accessed: May 2020]
[16] Visit Britain/Visit England (2016) *Op Cit.*
[17] Census (2011a) KS101EW – *Usual residential population*. Available at: https://www.nomisweb.co.uk/
[18] Census (2011a) *op. cit.*

Indicator	Newton-in-Bowland
Deprivation[19]	The parish is located in Ribble Valley 001B. This Lower Super Output Area (LSOA)[20] is ranked in IMD decile 5[21].
Residential properties	The community comprises approximately 90 residential properties.
Social infrastructure	Newton-in-Bowland Village Hall and United Reformed Church.
Agricultural activity	Approximately 40 farms have been identified including Manor House Farm.
Commercial operations	Approximately six receptors identified including Lowlands Stables, the Parkers Arms pub and a small selection of tourism accommodation (total bedspace estimate is 29).
Travel to work[22]	Approximately 10 % of employed residents work in Blackburn and 7 % in Preston. The main route for access to both is via the B6478 and A59 roads.

Roeburndale

43) Roeburndale is a rural community area with approximately ten residential properties and six farms including Leyland Farm, Stauvins Farm, Scale Farm and Outhwaite Farm. There are no proposed construction compounds within the community of Roeburndale; however, the Lower Houses Compound would be close to the eastern boundary of the community. There are three receptors within 1 km of the construction compound, of which two are residential properties (Scale Farm and Burnes Scale) and one is agricultural (Leyland Farm). The baseline characteristics of Roeburndale are summarised in Table 14.8.

Table 14.8: Roeburndale Baseline Data

Indicator	Roeburndale
Population[23]	Usual resident population is unknown.
Population density[24]	Population density is unknown compared to 2.0 in the RCAA.
Deprivation[25]	The parish is located in Lancaster 002B. This LSOA is ranked in IMD decile 6.
Residential properties	The community comprises approximately 10 residential properties.
Social infrastructure	None identified.
Agricultural activity	Six identified: Leyland Farm, Stauvins Farm, Scale Farm, Outhwaite Farm, Haylots Farm and Harterbeck Farm.
Commercial operations	None identified.
Travel to work[26]	Around 26 % of resident employees work in Lancaster and 11 % in Morecambe. Both are accessible via Roeburndale Road and the A683.

[19] MHCLG (2019) *op. cit.*
[20] Lower Layer Super Output Areas (LSOAs) are a geographic hierarchy designed to improve the reporting of small area statistics in England and Wales.
[21] Deprivation deciles are based on the Index of Multiple Deprivation 2019 which is the official measure of relative deprivation. Decile 1 represents the most deprived 10% (or decile) of neighbourhoods in England and Decile 10 represents the least deprived 10% (or decile) of neighbourhoods in England.
[22] Census (2011b) WF01BEW – *Location of usual residence and place of work (OA level)*. Available at: https://www.nomisweb.co.uk/
[23] Unknown because the census excludes data where count is <50.
[24] Census (2011a) *op. cit.*
[25] MHCLG (2019) *op. cit.*
[26] Census (2011b) *op. cit.*

Tatham

44) Tatham is a rural community area comprising approximately 120 residential properties, approximately 32 farms, a primary school, church, pub, a selection of guest houses and converted barns providing tourism accommodation. The largest settlement in the Tatham community is Lowgill which is located approximately 1.5 km south-east of the Lower Houses Construction Compound and comprises approximately 20 residential properties, Tatham Fells Primary School and Tatham Methodist Church.

45) The baseline characteristics of Tatham are summarised in Table 14.9.

Table 14.9: Tatham Baseline Data

Indicator	Tatham
Population[27]	Usual resident population is 396.
Population density[28]	Population density is 0.10 people per hectare compared to 2.0 in the RCAA.
Deprivation[29]	The parish is located in Lancaster 002B. This LSOA is ranked in IMD decile 6.
Residential properties	The community comprises approximately 120 residential properties.
Social infrastructure	Two receptors identified: Tatham Fells Primary School, Tatham Methodist Church.
Agricultural activity	Approximately 32 farms have been identified including Meal Bank Farm, Greenside Farm, Craggs Farm and Botton Head Farm.
Commercial operations	Receptors include Tatham Bridge Inn, and a selection of guest houses and converted barns (total bedspace estimate is 48).
Travel to work[30]	Approximately 22 % of employed residents work in Lancaster and 6 % in Preston. These are accessible through Wray with Botton.

Wray with Botton

46) Wray with Botton is characterised as a rural community. The village of Wray is the main hub of the community, located approximately 4 km north-west of the Lower Houses Compound. The community comprises approximately 190 residential properties, plus Wray with Botton Endowed Primary School and the Wray Methodist Church. There are also local businesses including four holiday lets, the Greenfoot Garden Centre, Royal Mail Delivery Office and Bridge House Tea Rooms. The baseline characteristics of Wray with Botton are summarised in Table 14.10.

Table 14.10: Wray with Botton Baseline Data

Indicator	Wray with Botton
Population[31]	Usual resident population is 532.
Population density[32]	Population density is 0.25 people per hectare compared to 2.0 in the RCAA.
Deprivation[33]	The parish is located in Lancaster 002B. This LSOA is ranked in IMD decile 6.
Residential properties	The community comprises approximately 190 residential properties.
Social infrastructure	Receptors include Wray with Botton Endowed Primary School, Wray Methodist Church, Wray Tatham & Tatham Fells C of E Church, Parish Church of the Holy Trinity, and Wray Institute Community Centre.

[27] Census (2011a) *op. cit.*
[28] Census (2011a) *op. cit.*
[29] MHCLG (2020) *op. cit.*
[30] Census (2011b) *op. cit.*
[31] Census (2011a) *op. cit.*
[32] Census (2011a) *op. cit.*
[33] MHCLG (2020) *op. cit.*

Indicator	Wray with Botton
Agricultural activity	Approximately 18 farms have been identified including Helks Bank Farm, Summersgill Farm and Lower Greenbank Farm.
Commercial operations	Receptors include a garden centre, tea rooms, a pub, a lumber store and a Royal Mail delivery office. Tourism accommodation receptors comprise a limited number of guest houses and B&Bs (total bedspace estimate is 24).
Travel to work[34]	Around 38 % of employed residents work in Lancaster which is accessible via the B6480 road. Approximately 6 % work in Morecambe.

14.6 Assessment of Likely Significant Effects

47) The following section describes the effects of the Proposed Bowland Section on communities and health during the enabling and construction phases.

14.6.1 Enabling Works

48) The following section presents the potential disturbance, severance, tourism accommodation and health effects on the communities surrounding the Proposed Bowland Section during the enabling works phase.

49) Enabling works at the main compounds, which would be expected to last approximately three months, would include fencing off working areas and preparing sites. This would consist of installing stock-proof post and wire fencing along access roads and higher Heras-type fencing or hoarding around compound areas. Working areas would be topsoil-stripped, and drainage would be installed where required. Where unavoidable, trees would be felled, and vegetation would be cleared. Compounds and laydown areas would be constructed and safe access to and egress from them would be provided via the local road network. Access points would be agreed with landowners prior to works commencing.

50) Enabling works would also include off-site highway works consisting of road widening and the introduction of passing places to allow vehicles travelling in opposite directions to safely pass each other on narrow sections of road. Junction modifications may also be required at some locations, while at others there are proposed park and ride facilities and heavy goods vehicle (HGV) holding areas to assist with traffic management plans. A 'remote' or 'satellite' compound is also proposed in the Hornby / Wray area. The effects on communities from the off-site highways works are considered separately in Volume 5, Part I.

51) A summary of enabling works effects associated with the Lower Houses and Newton-in-Bowland Compounds is provided in Table 14.16.

Disturbance Effects

Newton-in-Bowland LCAA

52) During enabling works, minor disturbance effects would be expected at 56 residential properties within the LCAA. Most of these are located in the village of Newton-in-Bowland, 500 m from the Newton-in-Bowland Compound. Disturbance effects would be likely to arise from a combination of minor noise effects and moderate visual effects. Two agricultural properties, Forber Farm and Lowlands Farm, would experience minor disturbance effects because of minor noise and moderate / major visual effects. Similarly, minor disturbance effects would also be expected on Bowland Village Hall, located in the centre of Newton-in-Bowland village, because of minor noise and moderate landscape and visual effects. Minor disturbance effects would be expected on commercial properties all located within the village of Newton-in-Bowland, including Hydes Farm tourism accommodation, Lowland Stables animal centre and the Parkers Arms pub.

[34] Census (2011b) *op. cit.*

53) Table 14.11 presents a summary of disturbance effects in the Newton-in-Bowland community during enabling works.

Table 14.11: Disturbance Effects During Enabling Works – Newton-in-Bowland LCAA

	No Disturbance Effect	Minor Disturbance Effect	Moderate Disturbance Effect	Major Disturbance Effect
Residential properties	31	56	0	0
Social infrastructure	1	1	0	0
Agricultural activities	31	2	0	0
Commercial operations	3	3	0	0
Total community receptors	**66**	**62**	**0**	**0**

54) Overall, Newton-in-Bowland would be likely to experience some disturbance effects during enabling works because of a combination of visual and noise effects. The majority of disturbance effects would be experienced in the village of Newton-in-Bowland, although disturbance effects would also arise at individual properties outside settlements.

55) As explained in Chapter 17: Noise and Vibration, mitigation measures would be put in place to avoid, reduce or offset any adverse effects on noise. These measures would include the use of generators with noise-dampening casings and exhaust silencers. It is expected that these would largely reduce disturbance effects due to noise emissions.

56) Given that the community area contains approximately 130 receptors and 62 of these would be expected to experience minor disturbance effects, which could be largely addressed through good practice mitigation, the likely overall effect on the community of Newton-in-Bowland is assessed as slight adverse and not significant.

Tatham LCAA

57) A total of 165 receptors were assessed for disturbance effects during enabling works. There are no residential properties, social infrastructure facilities, agricultural activities or commercial operations within Tatham which would be expected to experience disturbance effects during enabling works. Overall, the disturbance effect on the community of Tatham is assessed as negligible and not significant.

Roeburndale LCAA

58) A total of 16 receptors were assessed for disturbance effects during enabling works. Due to the rural and dispersed nature of residential and agricultural activities within Roeburndale, as well as the distance between the receptors and the Lower Houses Compound, no residential properties or agricultural activities would be expected to experience disturbance effects. The disturbance effect on the community of Roeburndale is assessed as negligible and not significant.

Wray with Botton LCAA

59) During enabling works minor disturbance effects would be expected on one residential property, Lower House Cottage, and its adjacent commercial operation, Lower House Farm B&B. The properties are located next to each other on Park House Lane within 100 m of the Lower Houses Compound, and disturbance effects would be expected to arise due to a combination of minor noise effects and major landscape and visual effects. Minor disturbance effects would be expected one agricultural activity, Bottom Hall Farm. The property is located within 500 m of the Lower Houses Compound. Disturbance effects would be expected to arise due to a combination of minor noise effects and major landscape and visual effects.

60) Table 14.12 presents a summary of disturbance effects in the community of Wray with Botton during enabling works.

Table 14.12: Disturbance Effects During Enabling Works – Wray with Botton LCAA

	No Disturbance Effect	Minor Disturbance Effect	Moderate Disturbance Effect	Major Disturbance Effect
Residential properties	191	1	0	0
Social infrastructure	2	0	0	0
Agricultural activities	17	1	0	0
Commercial operations	6	1	0	0
Total community receptors	**216**	**3**	**0**	**0**

61) Overall, Wray with Botton is likely to experience some disturbance effects during enabling works because of a combination of visual and noise effects. It is also acknowledged that disturbance effects are likely as a result of the implementation of the one-way system. However, given that the enabling phase is of a relatively short duration, and the volume of traffic to and from the Lower Houses Compound is low, the overall disturbance effect on the community of Wray in relation to the one-way system is assessed as not significant.

62) As explained in Chapter 17: Noise and Vibration, mitigation measures would be put in place to avoid, reduce or offset any adverse effects on noise. These measures would include the use of generators with noise-dampening casings and exhaust silencers. It is expected that these would largely reduce disturbance effects due to noise emissions.

63) Given that the community area contains over 200 receptors and only three of these would be expected to experience minor disturbance effects, which could be largely addressed through mitigation, the likely overall effect on the community of Wray with Botton is assessed as negligible and not significant.

Transport Routes Outside the LCAAs

64) While forecast traffic flows during the enabling works phase at the Bowland compounds are anticipated to be lower than during the main construction phase, they could still give rise to likely significant effects at locations along the transport routes to access the Newton-in-Bowland Compound. Depending on the final transport route solutions through and around the Clitheroe area to access the Newton-in-Bowland Compound, there is potential for disturbance effects in settlements such as Chatburn, Grindleton, West Bradford and Waddington, as well as Clitheroe.

65) United Utilities recognises that during the enabling works, some villages and local residential areas would experience disturbance. Disturbance would arise mainly from the movement of heavy goods vehicles through settlements and past individual properties fronting onto the highway. A degree of disturbance is an unavoidable consequence of constructing a major infrastructure project. Some of the community disturbance may be short-term and reversible, while other disturbance could continue and extend into and throughout the duration of the construction phase.

66) Some stakeholder groups have already provided feedback to United Utilities expressing their concerns about the level and duration of community impacts. In response to this feedback, United Utilities has developed alternative access proposals for some of the main HARP construction compounds – for example, the Proposed Ribble Crossing could alleviate impacts on communities in the Chatburn, Grindleton and West Bradford areas; the Proposed Hodder Crossing would remove construction traffic from Newton-in-Bowland village centre. In contrast, however, some of these solutions may not fully avoid community disturbance impacts, or could give rise to other impacts.

67) In addition to ongoing engineering investigations, to alleviate potential impacts on transport routes, United Utilities has developed Construction Traffic Management Plans (CTMP), outlining measures to be

implemented to further mitigate community disturbance. Through ongoing consultation with local people, local councils and highways authorities, United Utilities will continue to develop and refine mitigation proposals. It should be recognised that in some community areas, however, it may not be possible to fully eliminate adverse disturbance effects due to the scale of construction operations and associated vehicle movements. A precautionary position is therefore adopted in recognition of the nature, scope and duration of these adverse effects as it is anticipated that some communities would experience a disturbance effect that is significant in the context of the EIA Regulations.

Severance Effects

68) The following section summarises the predicted severance effects associated with enabling works activities.

Newton-in-Bowland LCAA

69) Severance effects in the community of Newton-in-Bowland are considered in Table 14.13.

Table 14.13: Summary of Severance Effects – Newton-in-Bowland LCAA

Severance	Community Severance Effect	Significance
Highways improvement works	On Slaidburn Road, local road widening is proposed to allow efficient flow of traffic along the construction traffic route. Whilst improvements would be made to the highways, local residents could face minor delays accessing residential and agricultural property. There are no proposed road closures in this location and effects would be experienced for a temporary period whilst highways improvement works were undertaken. As outlined in the CTMP, the Contractor would engage with local community groups and provide regular communication using digital media, social media, letter drops, newsletters etc. to keep residents informed. Therefore, the overall severance effect is assessed as minor.	Slight – not significant
Public Rights of Way (PRoW)	During construction, moderate effects would be expected on a number of local footpaths, long-distance trails and cycle routes in the Newton-in-Bowland community area. Whilst this could result in disturbance effects for users, it would not be likely to affect access to community facilities. Therefore, severance effects are assessed as negligible.	Slight – not significant
Agricultural land	The Newton-in-Bowland Compound would be located in agricultural land to the west of Newton-in-Bowland village. During construction there would be no areas of land isolated from a larger land holding due to the proposed layout of the compound. Therefore, there would be no potential for a severance effect.	N/A

Tatham LCAA

70) Severance effects in the community area of Tatham are considered in Table 14.14. There would be no compounds located within Tatham; therefore, there is no potential for a severance effect due to impacts on PRoW or agricultural land.

Table 14.14: Summary of Severance Effects – Tatham LCAA

Severance	Community Severance Effects	Significance
Highways improvement works	On Mewith Lane and the B6480 to the north of the Tatham community area, local road widening is proposed to allow efficient flow of traffic along the construction traffic route. Whilst improvements would be made to the highways, local residents could face minor delays accessing residential and agricultural property. There are no proposed road closures in this location and effects would be for a temporary period whilst highways improvement works were undertaken. As outlined in the CTMP, the Contractor would engage with local community	Slight – not significant

Severance	Community Severance Effects	Significance
	groups and provide regular communication using digital media, social media, letter drops, newsletters etc. Therefore, the overall severance effect is assessed as minor.	

Roeburndale LCAA

71) Roeburndale is a rural community area located to the west of the Lower Houses Compound. There are no proposed traffic routes or compounds located within Roeburndale; therefore, there is no potential for a severance effect.

Wray with Botton LCAA

72) Severance effects in the community of Wray with Botton are considered in Table 14.15.

Table 14.15: Summary of Severance Effects – Wray with Botton LCAA

Severance	Community Severance Effects	Significance
Highways improvement works	During enabling works, local road widening is proposed to allow efficient flow of traffic along the construction traffic route. Whilst improvements are being made to the highways, local residents could face minor delays accessing residential and agricultural property. There are no proposed road closures in this location and effects would be for a temporary period whilst highways improvement works were being undertaken. As outlined in the CTMP, the Contractor would engage with local community groups and provide regular communication using digital media, social media, letter drops, newsletters etc. The overall severance effect is assessed as minor.	Slight – not significant
Public Rights of Way (PRoW)	During enabling works, moderate effects would be expected on a number of local footpaths and cycle routes. Whilst this could result in disturbance effects for users, it is not anticipated to affect access to community facilities. Therefore, severance effects are assessed as negligible.	Slight – not significant
Agricultural land	The proposed Lower Houses Compound would be located on the agricultural land to the south-west of Lower Houses Farm. During construction there would be potential for small areas of agricultural land to be isolated from a larger land holding, requiring the landowner to route onto local roads to access this land. Adequate accessibility is available; therefore, the severance effect is assessed as minor.	Slight – not significant

Tourism Accommodation Effects

73) The total supply of serviced and non-serviced establishments in the RCAA is approximately 13,200 bedspaces, made up of 9,950 in Lancaster and 3,300 in the Ribble Valley. The peak construction workforce is estimated at 111 during tunnel boring machine (TBM) operation. The peak number of workers during enabling works would be significantly lower than the peak during construction and would not be expected to be of a level significant enough to result in adverse effects on tourism accommodation. The enabling works would be expected to be of a short duration. Given the plentiful supply of bedspaces available in the RCAA, it is considered that there would be enough capacity to absorb the additional workforce. Effects on tourism accommodation are therefore assessed as negligible, resulting in slight and not significant.

Health Effects

74) The methodology for the health assessment presented in Appendix 14.1 is based partly upon identifying health determinants that are linked to significant residual effects in the Environmental Statement. On

this basis, potential adverse health effects were identified due to links between the following combinations of health determinants and EIA topics:

- Severance, disturbance, access to community, recreational and educational facilities – Chapter 6: Landscape and arboriculture
- Access to green and open spaces and other natural capital - Chapter 9A: Terrestrial Ecology
- Communities and health - Chapter 14: Communities and Health.

75) Given the relatively low number of receptors exposed to these impacts within the LCAAs as a proportion of the overall community, the combination of multiple health stressors is not expected to result in greater adverse health outcomes to the population near Newton-in-Bowland compound and Lower Houses compound. The overall health outcome for the LCAAs was assessed as adverse but not significant because the health effects would be partly or fully mitigable and likely reversible.

76) The potential for negative health outcomes arising from disturbance effects is dependent on the final haulage route solutions through and around the Clitheroe area to access the Newton-in-Bowland Compound, and around the Wray area to access the Lower Houses compound. Appendix 14.1 reports that there is potential for disturbance effects in settlements in local communities and settlements during the enabling works phase, especially in connection with the proposed off-site highways works.

77) The full health assessment is presented in Appendix 14.1: Health Assessment.

Summary of Enabling Works Effects

78) A summary of enabling works effects is provided in Table 14.16.

Table 14.16: Summary of Enabling Works Effects

Community	Value / Sensitivity	Effect	Nature of Effect	Magnitude	Significance of Effect (Pre-Mitigation)
Newton-in-Bowland LCAA	High	Disturbance effects	Disturbance effects on community receptors due to combined environmental effects	Minor disturbance effects expected on 62 community receptors	Slight – not significant
		Severance effects (highways improvements)	Effects on access to community facilities due to highways improvement works	Minor – temporary effects due to road improvements unlikely to affect access to community facilities	Slight – not significant
		Severance effects (PRoW)	Effects on access to community facilities due to diversions or closures of PRoW	Negligible – unlikely to result in any effects on access to community facilities	Slight – not significant
		Severance effects (agricultural land)	Effects on access to property and agricultural land	No effect – no land would be isolated from a larger land holding	N/A
Tatham LCAA	High	Disturbance effects	Disturbance effects on community receptors due to combined environmental effects	No disturbance effects expected	Negligible – not significant
		Severance effects (highways improvements)	Effects on access to community facilities due to highways improvement works	Minor – temporary effects due to road improvements unlikely to affect access to community facilities	Slight – not significant
Roeburndale LCAA	High	Disturbance effects	Disturbance effects on community receptors due to combined environmental effects	No disturbance effects expected	Negligible – not significant
Wray with Botton LCAA	High	Disturbance effects	Disturbance effects on community receptors due to combined environmental effects	Minor disturbance effects on three community receptors	Negligible – not significant
		Severance effects (highways improvements)	Effects on access to community facilities due to highways improvement works	Minor – temporary effects due to road improvements unlikely to affect access to community facilities	Slight – not significant

Community	Value / Sensitivity	Effect	Nature of Effect	Magnitude	Significance of Effect (Pre-Mitigation)
		Severance effects (PRoW)	Effects on access to community facilities due to diversions or closures of PRoW	Negligible – unlikely to result in any effects on access to community facilities	Slight – not significant
		Severance effects (agricultural land)	Effects on access to property and agricultural land	Minor – adequate accessibility would be available	Slight – not significant
Transport routes outside the LCAA	High	Disturbance effects	Disturbance effects on communities due to increased flows of heavy goods vehicles.	Significant disturbance effects to communities located outside of the LCAA boundary located on traffic routes to access the Newton-in-Bowland Compound. This includes the settlements of Clitheroe, Waddington, Chatburn, West Bradford and Grindleton. In these locations, the volume, duration, and nature of traffic associated with the Proposed Bowland Section has the potential to give rise to significant disturbance effects.	Adverse – significant
RCAA	High	Tourism accommodation effects	Potential impacts on tourism accommodation due to demands from workers during enabling works	Negligible – given the plentiful supply of bedspaces available in the RCAA, it is considered that there would be enough capacity to absorb the additional workforce.	Slight – not significant
RCAA	High	Health	The perception of a more stressful and poor-quality environment and disturbance to recreational cycle routes and long-distance footpaths may contribute to adverse health effects.	The overall health outcome is assessed as being adverse but not significant because the health effects would likely be reversible. The full health assessment is presented in Appendix 14.1.	Adverse – not significant

14.6.2 Construction Phase

79) The following section presents the potential effects on the communities surrounding the Proposed Bowland Section during the construction phase.

Disturbance Effects

Newton-in-Bowland LCAA

80) During construction works, minor disturbance effects would be expected at 56 residential properties. The majority are located in the village of Newton-in-Bowland, 500 m from the Newton-in-Bowland Compound. Disturbance effects would be likely to result due to a combination of minor noise effects and moderate visual effects. Two agricultural receptors (Forber Farm and Lowlands Farm) would be expected to experience minor disturbance effects as a result of noise and visual effects. Minor disturbance effects as a result of minor noise and moderate landscape and visual effects would also be expected on Bowland Village Hall, located in the centre of Newton-in-Bowland village. Minor disturbance effects would be expected on three commercial operations all located within the village of Newton-in-Bowland, including Hydes Farm tourist accommodation, Lowland Stables animal centre and the Parkers Arms pub.

81) Table 14.17 presents a summary of disturbance effects in the Newton-in-Bowland community during construction works.

Table 14.17: Disturbance Effects During Construction Works – Newton-in-Bowland LCAA

	No Disturbance Effect	Minor Disturbance Effect	Moderate Disturbance Effect	Major Disturbance Effect
Residential properties	31	56	0	0
Social infrastructure	1	1	0	0
Agricultural activities	31	2	0	0
Commercial operations	3	3	0	0
Total community receptors	**66**	**62**	**0**	**0**

82) Overall, Newton-in-Bowland LCAA would be likely to experience some disturbance effects during construction works because of a combination of traffic, visual and noise effects. Within the LCAA the majority of disturbance effects would be experienced in the village of Newton-in-Bowland. The likely overall effect on the community of Newton-in-Bowland is assessed as slight adverse and not significant

83) As explained in Chapter 17: Noise and Vibration, mitigation measures would be put in place to avoid, reduce or offset any adverse effects on noise. These measures would include the use of generators with noise-dampening casings and exhaust silencers. It is expected that these would largely reduce disturbance effects due to noise emissions. The CCoP sets out the management and mitigation measures that would be employed at each site to avoid, reduce or offset any adverse effects of the Proposed Bowland Section on the local highways network.

Tatham LCAA

84) A total of 165 receptors were assessed for disturbance effects during construction works. There are no residential properties, social infrastructure facilities, agricultural activities or commercial operations within Tatham which are expected to experience disturbance effects during construction works.

85) Overall, the disturbance effect on the community of Tatham is assessed as negligible and not significant.

Roeburndale LCAA

86) During construction works one agricultural receptor (Leyland Farm), located 500 m north-west of the Lower Houses Compound, would be expected to experience minor disturbance effects as a result of minor noise and visual effects.

87) Table 14.18 presents a summary of disturbance effects in the Roeburndale community during enabling works.

Table 14.18: Disturbance Effects During Construction Works – Roeburndale LCAA

	No Disturbance Effect	Minor Disturbance Effect	Moderate Disturbance Effect	Major Disturbance Effect
Residential properties	15	0	0	0
Social infrastructure	0	0	0	0
Agricultural activities	0	1	0	0
Commercial operations	0	0	0	0
Total community receptors	**15**	**1**	**0**	**0**

88) One agricultural activity would experience minor disturbance effects. As explained in Chapter 17: Noise and Vibration, mitigation measures would be put in place to avoid, reduce or offset any adverse effects on noise. These measures would include the use of generators with noise-dampening casings and exhaust silencers. It is expected that these would largely reduce disturbance effects due to noise emissions.

89) Given that the community area contains 15 receptors and only one of these would be expected to experience minor disturbance effects, which could be largely addressed through mitigation, the likely overall effect on the community of Roeburndale LCAA is assessed as negligible and not significant.

Wray with Botton LCAA

90) During construction works minor disturbance effects would be expected on one residential property, Lower House Cottage, and its adjacent commercial operation, Lower House Farm B&B, due to a combination of minor noise effects and major landscape and visual effects. The receptors are located next to each other on Park House Lane within 100 m of the Lower Houses Compound. Minor disturbance effects would also be expected on one agricultural activity, Bottom Hall Farm, located within 500 m of the compound area, due to a combination of minor noise effects and major landscape and visual effects.

91) Table 14.19 presents a summary of disturbance effects in the Wray with Botton community during construction works.

Table 14.19: Disturbance Effects During Construction Works – Wray with Botton LCAA

	No Disturbance Effect	Minor Disturbance Effect	Moderate Disturbance Effect	Major Disturbance Effect
Residential properties	208	1	0	0
Social infrastructure	2	0	0	0
Agricultural activities	1	1	0	0
Commercial operations	6	1	0	0
Total community receptors	**217**	**3**	**0**	**0**

92) Overall, Wray with Botton LCAA would be likely to experience some disturbance effects during construction works as a result of a combination of visual and noise effects. All disturbance effects would be expected on the properties within 500 m of the Lower Houses Compound.

93) It is also acknowledged that disturbance effects could result within the LCAA from implementation of the one-way system in the Helk's Brow area. However, given that the construction works at the Lower Houses Compound is of a relatively short duration, and the volume of traffic to and from the compound far lower than that estimated at the south end of the Proposed Bowland Section, the disturbance effect on the communities of Wray and Tatham in relation to the one-way system is assessed as not significant.

94) As explained in Chapter 17: Noise and Vibration, mitigation measures would be put in place to avoid, reduce or offset any adverse effects on noise. These measures would include the use of generators with noise-dampening casings and exhaust silencers. It is expected that these would largely reduce disturbance effects due to noise emissions.

95) Given that the community area contains 200 receptors and three would be expected to experience minor disturbance effects, which could be largely addressed through mitigation, the likely overall effect on the community of Wray with Botton is assessed as negligible and not significant.

Transport Routes Outside the LCAAs

96) United Utilities recognises that during the construction works, some villages and local residential areas would experience disturbance, specifically in relation to haulage routes to access the Newton-in-Bowland Compound. Disturbance would arise mainly from the movement of heavy goods vehicles through settlements and past individual properties fronting onto the highway. A degree of disturbance is an unavoidable consequence of constructing a major infrastructure project. Community disturbance along the transport routes may continue throughout the duration of the construction phase.

97) Some stakeholder groups have already provided feedback to United Utilities expressing their concerns about the level and duration of community impacts during the construction phase. In response to this feedback, United Utilities has developed alternative access proposals for some of the main HARP construction compounds – for example, the Proposed Ribble Crossing could alleviate impacts on communities in the Chatburn, Grindleton and West Bradford areas; the Proposed Hodder Crossing would remove construction traffic from Newton-in-Bowland village centre. In contrast, however, some of these solutions may not fully avoid community disturbance impacts, or could give rise to other impacts.

98) In addition to ongoing engineering investigations to alleviate potential impacts on transport routes, United Utilities has developed Construction Traffic Management Plans (CTMP), outlining measures to be implemented to further mitigate community disturbance. Through ongoing consultation with local people, local councils and highways authorities, United Utilities will continue to develop and refine mitigation proposals. It should be recognised that in some community areas, however, it may not be possible to fully eliminate adverse disturbance effects due to the scale of construction operations and associated vehicle movements. A precautionary position is therefore adopted in recognition of the nature, scope and duration of these adverse effects as it is anticipated that some communities would experience a disturbance effect that is significant in the context of the EIA Regulations.

Severance Effects

Newton-in-Bowland LCAA

99) During construction works, two routing options are proposed to access the Newton-in-Bowland Compound:

- Option 1: Use of the existing highway network. Access to and from the Newton-in-Bowland Compound for light vehicles and heavy goods vehicles (HGVs) under 3.5 m in height would be gained via the A59, Pimlico Link Road, Chatburn Road and through Waddington along the B6478 Well Terrace / Waddington Road / Clitheroe Road / Slaidburn Road / Hall Gate Hill (hereafter referred to as 'Route 1'). HGVs over 3.5 m in height and abnormal loads would access Newton-in-Bowland Compound through Clitheroe via the A59, Pimlico Link Road, Clitheroe Road, Crow Trees Brow, Ribble

Lane, Grindleton Road and along the B6478 Waddington Road, West Bradford Road, Slaidburn Road (hereafter referred to as 'Route 2').

- Option 2: Temporary construction access track over River Ribble. Construction traffic would access the Newton-in-Bowland Compound from the A59 and onto Pimlico Link Road before joining a new temporary construction access track starting just to the south of the existing West Bradford Road bridge. The new road would cross the River Ribble before running through farmland and re-joining West Bradford Road to the east of Waddington. Construction traffic would then skirt north of Waddington before travelling onto Slaidburn Road towards the compound.

100) The severance effects for both route options are considered below.

101) Severance effects in the community of Newton-in-Bowland are considered in Table 14.20.

Table 14.20: Summary of Severance Effects – Newton-in-Bowland LCAA

Severance	Community Severance Effect	Significance
Traffic volume, severance, driver delay, pedestrian delay	As reported in Chapter 16: Traffic and Transport, for both route options, during construction works peak traffic volumes on B6478 Slaidburn Road (north) would be expected to increase by 12.6 % for all traffic and 101.0 % for HGVs compared to baseline conditions. As an average, this would represent an additional vehicle every 2.8 minutes against background traffic flows. Traffic would access the Newton-in-Bowland Compound via the B6478 Slaidburn Road (north). There is little or no pedestrian demand on this link and no footway exists to access community facilities. Therefore, severance effects are assessed as negligible.	Slight – not significant
Bus services	As a result of the Proposed Programme of Works at the Newton-in-Bowland Compound, up to 36 bus services for Option 1 and up to 15 bus services for Option 2 could be affected, which could affect travel between Blackburn and Preston, Skipton and Preston, Clitheroe and Blackburn, and Clitheroe and Nelson. Whilst there could be minor delays to bus services, this would not be expected to result in impacts on access to community facilities. Therefore, severance effects are assessed as negligible.	Slight – not significant
Public Rights of Way (PRoW)	No new construction phase effects have been identified. Effects would be consistent with those identified in the enabling works phase. Therefore, severance effects are assessed as negligible.	Slight – not significant
Agricultural land	No new construction phase effects have been identified. Effects would be consistent with those identified in the enabling works phase. Therefore, severance effects are assessed as not applicable.	No effect

Tatham LCAA

102) The Lower Houses Compound would be located to the west of the Tatham community area. During construction, HGVs less than 9.5 m long and light vehicles would travel along the B6480 through Wennington and towards Low Bentham. Vehicles would then follow Eskew Lane, Long Lane before turning onto Mewith Lane, Furnessford Road reaching Park House Lane. Access from the Lower Houses Compound would follow a one-way system with vehicles travelling along Helks Brow towards Wray before re-joining Long Lane towards Low Bentham, and turning onto the B6480 towards Wennington and Wray (hereafter referred to as 'Route 2 Lower Houses'). Whilst the Lower Houses Compound would not be located within Tatham, a large part of the haulage route would take receptors through this community area, giving rise to potential severance effects for the local community.

103) Severance effects in the community of Tatham are considered in Table 14.21. There are no proposed compounds located within Tatham; therefore, there is no potential for a severance effect due to effects on PRoW or agricultural land.

Table 14.21: Summary of Severance Effects – Tatham LCAA

Severance	Community Severance Effect	Significance
Traffic volume, severance, driver delay, pedestrian delay	Construction traffic would travel along the B6480 Hornby Road in the north of the Tatham community area before travelling towards Wennington, Low Bentham and back into the Tatham community area on Long Lane and Mewith Lane. As reported in Chapter 16: Traffic and Transport, during the construction phase no significant effects would be expected on traffic volume, severance, driver delay or pedestrian delay for either route within the Tatham community area. It is likely that the volume of additional vehicle movements could generate negative perceptions by local residents within the Tatham community area including properties on Mewith Lane, Furnessford Road and Spen Brow. Similarly, users of Hill Farm Caravan Park and Spen House holiday cottage would be likely to notice an increase in traffic and could experience slight effects on driver delay on narrow sections of the road when two vehicles were passing. These links do not represent key sections on the road network and the increase in traffic would not be expected to affect the ability of the community to access community facilities. Therefore, severance effects are assessed as negligible.	Slight – not significant
Bus services	During construction, up to nine services could be affected as a result of the Proposed Programme of Works at the Lower Houses Compound. These services travel on routes between Lancaster and Kirkby Lonsdale, Lancaster and Ingleton as well as Carnforth High School and Brookhouse. Whilst there could be minor delays to bus services, this would not be expected to result in impacts on access to community facilities. Therefore, severance effects are assessed as negligible.	Slight – not significant

Roeburndale LCAA

104) Roeburndale is a rural community area located to the west of the Lower Houses Compound. There would be no traffic routes or compounds located within Roeburndale; therefore, there is no potential for a severance effect.

Wray with Botton LCAA

105) During construction, abnormal loads and HGVs over 9.5 m long would travel through the village of Wray via Main Street to continue via Helks Brow for approximately 3 km before reaching the Lower Houses Compound. General traffic would travel along the route described above for the Tatham community area.

106) Severance effects in the community of Wray with Botton are considered in Table 14.22.

Table 14.22: Summary of Severance Effects – Wray with Botton LCAA

Severance	Community Severance Effect	Significance
Traffic volume, severance, driver delay, pedestrian delay	As stated in Chapter 16: Traffic and Transport, negligible / slight effects are expected on severance, driver delay and pedestrian delay for all routes within the Wray with Botton community area. Whilst effects on traffic are assessed as not significant, it is likely that the volume of additional vehicle movements could generate negative perceptions by local residents. Particularly, community receptors within the centre of Wray and those in more remote areas of the community area including residential and agricultural properties on Helks Brow and Park House Lane. Negative perceptions could be avoided by managing site operations during school opening / closure times to reduce coincidence with activity. Similarly, the contractor would engage local	Slight – not significant

Severance	Community Severance Effect	Significance
	community groups in a communication and dialogue process which would allow local residents to express views and work collaboratively with the contractor to come to an agreement. Therefore, severance effects are assessed as negligible.	
Traffic management measures	During construction a range of traffic management measures would be put in place within the Wray with Botton community to help facilitate traffic flow to the Lower Houses Compound. This would include temporary parking restrictions, a designated parking area for residents' vehicles (located at Bridge House Farm Café), access-only arrangements on Main Street in Wray, holding areas, temporary road-blocks / cordons and advanced vehicle teams. Although residents would be likely to face some disruption from the proposed traffic management measures, access to residential properties and community facilities would be maintained at all times. In developing the final CTMP, the Contractor would consult with affected residents in advance to ensure individual circumstances (particularly for the elderly or those with disabilities) are taken into account. A management structure would also be developed to oversee the implementation of the CTMP, and local community groups would be engaged in a communication and dialogue process which would allow local residents to express views and work collaboratively with the Contractor to come to an agreement. Based on the mitigation measures set out in the CTMP the severance effects on the community of Wray are assessed as minor.	Slight – not significant
Bus services	During construction, up to eight services for Route 1 and nine services for Route 2 could be affected as a result of the Proposed Programme of Works at the Lower Houses Compound. These services travel on routes between Lancaster and Kirkby Lonsdale, Lancaster and Ingleton as well as Carnforth High School and Brookhouse. Whilst there could be minor delays to bus services, this would not be expected to result in impacts on access to community facilities. Therefore, severance effects are assessed as negligible.	Slight – not significant
PRoW	No new construction phase effects have been identified. Effects would be consistent with those identified in the enabling works phase. Therefore, severance effects are assessed as negligible.	Slight – not significant
Agricultural land	No new construction phase effects have been identified. Effects would be consistent with those identified in the enabling works phase. Therefore, severance effects are assessed as minor.	Slight – not significant

Tourism Accommodation Effects in the RCAA

107) Construction would require a workforce with varied skills, ranging from foremen and attendants, drivers and banksmen, to electricians and fitters. Some skills would be highly specialist, such as TBM drivers and fitters. There may be some supply of workers from the local workforce, but it is assumed that the majority of construction workers would be sourced from outside the communities considered in this assessment. These workers would need to secure accommodation in the local area, which could create demand for tourism accommodation, placing additional pressure upon supply for visitors.

108) The TBM launch site would be located at the Newton-in-Bowland Compound near the community area of Newton-in-Bowland. The peak construction workforce for each TBM launch site is estimated to be 111. The total supply of bedspaces in serviced and non-serviced establishments in the Lancaster City Council district is approximately 9,950. Assuming a peak occupancy level of 55 %, the demand for accommodation by construction workers would equate to approximately 2.0 % of total headroom, suggesting that there would be enough capacity in the RCAA to absorb the additional workforce. The Newton-in-Bowland Compound would be located within the Travel to Work Area (TTWA) of 'Blackburn'.

Therefore, it is reasonable to assume that workers could commute from Clitheroe, Blackburn, Burnley, Accrington or Preston, which are all large towns within the TTWA. Clitheroe is a journey of seven miles and typically takes 16 minutes to drive. Blackburn, which is a much larger settlement, is approximately 18 miles away from Newton-in-Bowland Compound and the journey time would likely be 35 - 50 minutes, depending on traffic.

109) The TBM reception shaft would be located at the Lower Houses Compound near the communities of Wray with Botton, Roeburndale and Tatham. As this would be a reception shaft, the number of construction workers would be expected to be significantly lower than at the TBM launch site. As a precautionary assessment, the peak number of construction workers has been assumed as equal to the TBM launch site (peak of 111). The total supply of bedspaces in serviced and non-serviced establishments in the Ribble Valley district is approximately 3,300.[16] Assuming a peak occupancy level of 55 %, the demand for accommodation by construction workers would equate to approximately 6.1 % of total headroom, suggesting that there would be enough capacity in the RCAA to absorb the additional workforce. The compound would be located within the TTWA of 'Lancaster and Morecombe'. Therefore, it is reasonable to assume that workers could commute from Lancaster, Morecambe and Heysham, which are all large towns within the TTWA. Lancaster is the closest built-up area, located approximately 12 miles to the west, and is typically a 25 - 35-minute drive from the site.[35]

110) In summary, the headroom calculations indicate that there would be sufficient capacity in total in the RCAA to absorb the additional workforce. Both Lower Houses and Newton-in-Bowland Compounds would be located within a reasonable distance of major towns with plentiful bedspaces available. Therefore, the magnitude is assessed as minor resulting in slight and not significant effects on tourism accommodation.

Health Effects

111) The methodology for the health assessment presented in Appendix 14.1 is based partly upon identifying health determinants that are linked to significant residual effects in the Environmental Statement. On this basis, potential adverse health effects were identified due to links between the following combinations of health determinants and EIA topics:

- Severance, disturbance, access to community, recreational and educational facilities – Chapter 6: Landscape and arboriculture
- Access to green and open spaces and other natural capital - Chapter 9A: Terrestrial Ecology
- Communities and health - Chapter 14: Communities and Health.

112) Given the relatively low number of receptors exposed to these impacts within the LCAAs as a proportion of the overall community, the combination of multiple health stressors is not expected to result in greater adverse health outcomes to the population near Newton-in-Bowland compound and Lower Houses compound. The overall health outcome for the LCAAs was assessed as adverse but not significant because the health effects would be partly or fully mitigable and likely reversible.

113) The potential for negative health outcomes arising from disturbance effects is dependent on the final haulage route solutions through and around the Clitheroe area to access the Newton-in-Bowland Compound, and around the Wray area to access the Lower Houses compound. Appendix 14.1 reports that there is potential for disturbance effects in settlements in local communities and settlements during the enabling works phase, especially in connection with the proposed off-site highways works.

114) The full health assessment is presented in Appendix 14.1: Health Assessment

Summary of Construction Works Effects

115) A summary of construction effects is provided in Table 14.23.

[35] Drive time derived from estimated travel time based on normal driving speeds – Google, 2020.

Table 14.23: Summary of Construction Phase Effects

Community	Value / Sensitivity	Effect	Nature of Effect	Magnitude	Significance of Effect (Pre-Mitigation)
Newton-in-Bowland LCAA	High	Disturbance effects	Disturbance effects on community receptors due to combined environmental effects	Minor disturbance effects expected on 62 community receptors	Slight – not significant
		Severance effects (increased traffic)	Effects on access to community facilities due to increased traffic volumes, driver delay, pedestrian delay and pedestrian severance	Negligible – increased traffic flow would not be expected to affect access to community facilities	Slight – not significant
		Severance effects (bus services)	Delays to local bus services impacting on access to community facilities	Negligible – potential effects on up to 36 bus services unlikely to result in delays in accessing community facilities	Slight – not significant
		Severance effects (PRoW)	Effects on access to community facilities due to diversions or closures of PRoW	Negligible – unlikely to result in any effects on access to community facilities	Slight – not significant
		Severance effects (agricultural land)	Effects on access to property and agricultural land	Effects would be consistent with those identified in the enabling works phase; severance effects are assessed as not applicable	N/A
Tatham LCAA	High	Disturbance effects	Disturbance effects on community receptors due to combined environmental effects	No disturbance effects expected	Negligible – not significant
		Severance effects (increased traffic)	Effects on access to community facilities due to increased traffic volumes, driver delay, pedestrian delay and pedestrian severance	Negligible – increased traffic flow would not be expected to affect access to community facilities	Slight – not significant
		Severance effects (bus services)	Delays to local bus services impacting on access to community facilities	Negligible – potential effects on up to nine bus services unlikely to result in delays in accessing community facilities	Slight – not significant
Roeburndale LCAA	High	Disturbance effects	Disturbance effects on community receptors due to combined environmental effects	Minor disturbance effect on one community receptor	Negligible – not significant
Wray with Botton LCAA	High	Disturbance effects	Disturbance effects on community receptors due to combined environmental effects	Minor disturbance effect on three community receptors	Negligible – not significant

Community	Value / Sensitivity	Effect	Nature of Effect	Magnitude	Significance of Effect (Pre-Mitigation)
		Severance effects (increased traffic)	Effects on access to community facilities due to increased traffic volumes, driver delay, pedestrian delay and pedestrian severance	Negligible – increased traffic flow would not be expected to affect access to community facilities	Slight – not significant
		Severance effects (bus services)	Delays to local bus services impacting on access to community facilities	Negligible – potential effects on up to nine bus services unlikely to result in delays in accessing community facilities	Slight – not significant
		Severance effects (PRoW)	Effects on access to community facilities due to diversions or closures of PRoW	Negligible – effects would be consistent with those identified in the enabling works phase	Slight – not significant
		Severance effects (agricultural land)	Effects on access to property and agricultural land	Minor – effects would be consistent with those identified in the enabling works phase.	Slight – not significant
Transport routes outside the LCAA	High	Disturbance effects	Disturbance effects on communities due to increased traffic flow	Significant disturbance effects to communities located outside of the LCAA boundary located on traffic routes to access the Newton-in-Bowland Compound. This includes the settlements of Clitheroe, Waddington, Chatburn and Grindleton. In these locations, the volume, duration, and nature of traffic associated with the Proposed Bowland Section has the potential to give rise to significant disturbance effects.	Adverse – significant
RCAA	High	Tourism accommodation effects	The workforce would need to secure accommodation in the local area, which could create demand for tourism accommodation, placing additional pressure upon supply for visitors.	Minor – there would be sufficient capacity in total in the RCAA to absorb the additional workforce	Slight – not significant
RCAA	High	Health	The perception of a more stressful and poor-quality environment and disturbance to recreational cycle routes and long-distance	The overall health outcome is assessed as being adverse but not significant because the health effects would likely be reversible. The full	Adverse – not significant

Community	Value / Sensitivity	Effect	Nature of Effect	Magnitude	Significance of Effect (Pre-Mitigation)
			footpaths may contribute to adverse health effects.	health assessment is presented in Appendix 14.1: Health Assessment.	

14.6.3 Commissioning Phase

116) The following section presents the potential effects on the communities surrounding the Proposed Bowland Section during the commissioning phase.

117) Commissioning works (including connection to the wider water network) would be undertaken following completion of the main construction works, although the precise timing of when these works would be undertaken would depend on the commissioning approach adopted by the Contractor. These works would include the connection of the new tunnel to the existing Haweswater Aqueduct, and the strip-out of tunnelling infrastructure including all rails, communication lines, debris and surface contamination on retreat from the tunnel, a deep clean of the pipe and final disinfection and sampling.

Disturbance Effects

118) Commissioning works would be likely to occur for a short duration (approximately two months) and would generate limited additional traffic. Air quality effects have been assessed as imperceptible. Potential disturbance effects would be possible as a result of minor landscape and visual effects; however, these would be experienced across only a small proportion of the landscape. Noise effects have been assessed as slight and not significant. Therefore, negligible disturbance effects are expected on all communities.

Severance Effects

119) During commissioning, the potential additional traffic generated would be minor. There would be no permanent changes in traffic management measures such as road closures which would result in impacts on the local community accessing community facilities. Therefore, severance effects would not be likely to be significant for any community.

Tourism Accommodation Effects

120) The potential for construction workers to put pressure on demand for tourism accommodation has been assessed based on the estimated peak workforce. During the commissioning phase, the increase in workers would represent only a very minor change from baseline conditions. The commissioning phase would last approximately three months and would not be expected to result in effects on tourism accommodation within the context of the wider RCAA. Therefore, the magnitude of effect is assessed as negligible resulting in slight and not significant effects on tourism accommodation.

Health Effects

121) Appendix 14.1: Health Assessment reports that there would be no significant residual health effects associated with the commissioning phase.

14.6.4 Operational Phase

122) The following section presents the potential effects on the communities surrounding the Proposed Bowland Section during the operational phase.

123) For most of the length of the replacement aqueduct there would be no permanent above-ground structures with many of the new sections of aqueduct being located deep below ground level. Valve house buildings and other minor structures such as kiosks would be required on the proposed Bowland Section at the Lower Houses Compound and the Newton-in-Bowland Compound. These buildings would require access for operation via small stone access roads. Operation activities would generally be restricted to light vehicle access to service valves and take water quality samples.

Disturbance Effects

124) During operation, whilst there could be landscape and visual effects, the small scale of any maintenance works would not be expected to result in any noise, air quality or traffic effects. Therefore, negligible disturbance effects are expected for all communities.

Severance Effects

125) During the operational phase, the potential additional traffic generated by the Proposed Bowland Section would be minor. There would be no permanent changes in traffic management measures which would result in impacts on the local community accessing community facilities. All agricultural land would be reinstated. Therefore, severance effects would not be likely to be significant for any community.

Tourism Accommodation Effects

126) During the operational phase, workers would be required only on a one-off basis for maintenance and monitoring purposes. This would not be expected to result in effects on tourism accommodation within the context of the wider RCAA. Therefore, the magnitude of effect is assessed as negligible, resulting in slight and not significant effects on tourism accommodation.

Health Effects

127) All topics were scoped out for the operational phase because there is no clear source from where a potential health effect could originate. Therefore, no adverse health effects have been identified. Health effects are set out in full in Appendix 14.1: Health Assessment.

14.7 Essential Mitigation and Residual Effects

128) As explained in Section 14.4.6, assessments presented in this ES take account of embedded mitigation and good practice measures for the Proposed Bowland Section.

129) The communities and health assessment has been informed by the residual effects reported for landscape and arboriculture (Chapter 6), transport planning (Chapter 16), noise and vibration (Chapter 17), and air quality and climate change (Chapter 18). The reported residual effects take into account embedded mitigation and good practice measures, as well as any additional topic-specific essential mitigation identified within the respective chapters.

130) No additional essential mitigation for communities and health has been identified over and above the measures contained within the chapters referenced in this assessment.

131) United Utilities recognises that during the enabling works, which will include the construction of off-site highways works serving the traffic routes for the main compounds, and during the main construction programme at the Lower Houses / Newton-in-Bowland / Bonstone / Braddup Compounds, some local communities would experience disturbance. Disturbance would arise mainly from the movement of heavy goods vehicles through settlements and past individual properties fronting onto the highway. A degree of disturbance is an unavoidable consequence of constructing a major infrastructure project. Some of the community disturbance would be short-term and reversible, while other disturbance may continue throughout the duration of the construction programme.

132) Some stakeholder groups have already provided feedback to United Utilities expressing their concerns about the level and duration of community impacts. In response to this feedback, United Utilities has developed alternative access proposals for some of the main HARP construction compounds – for example, the Proposed Ribble Crossing could alleviate impacts on communities in the Chatburn, Grindleton and West Bradford areas; the Proposed Hodder Crossing would remove construction traffic from Newton-in-Bowland village centre; the proposed Park and Ride facility at the Ribblesdale Cement Works would alleviate the volume of private vehicles travelling beyond the Clitheroe area. In contrast, however, some of these solutions may not fully avoid community disturbance impacts, or could give rise to other impacts.

133) In addition to ongoing engineering investigations to alleviate potential impacts on transport routes, United Utilities has developed Construction Traffic Management Plans (CTMP), outlining measures to be implemented to further mitigate community disturbance. Through ongoing consultation with local people, local councils and highways authorities, United Utilities will continue to develop and refine mitigation proposals prior to the commencement of the enabling works and during the construction

phase. A community liaison officer would be appointed to act as a point of contact for community engagement.

14.8 Cumulative Effects

134) The following section provides an overview of the potential cumulative effects from different proposed developments and land allocations, in combination with the Proposed Bowland Section (i.e. inter-project cumulative assessment). Data on proposed third-party developments and land allocations contained in development plan documents were obtained from various sources, including local planning authority websites, online searches, and consultations with planning officers. Proposed development data were then reviewed with a view to identifying schemes or land allocations whose nature, scale and scope could potentially give rise to significant environmental effects when considered in combination with the likely effects arising from the Proposed Bowland Section.

135) It is important to note that future growth on the local road network was taken into account in the traffic modelling described in Chapter 16: Transport Planning. For this reason, the potential cumulative effects of future traffic growth between the Proposed Bowland Section and other proposed developments are embedded into predicted road traffic-related impacts on highways capacity, air quality and noise.

136) The overarching cumulative effects of the Proposed Programme of Works i.e. the five proposed replacement tunnel sections in combination, are considered in Chapter 19: Cumulative Effects. In addition, Chapter 19 examines the cumulative effects associated with the outcomes from Volume 2 (delivery and operation of the main construction compounds, tunnel, and construction traffic routes), Volume 5 (proposed off-site highways works and satellite compounds), and Volume 6 (Proposed Ribble Crossing).

137) Based on professional judgement, it was concluded that there are no proposed third-party developments or land allocations in local development plan documents which could potentially give rise to likely significant cumulative effects. However, it is noted that delivery of the Proposed Marl Section, subject to planning, could coincide with the enabling works and part of the construction period for the Newton-in-Bowland compound. It is anticipated, however, that in the event that both the Proposed Bowland Section and the Proposed Marl Hill Section were to go ahead, there would be no additional significant disturbance effects over those described in this chapter.

14.9 Conclusion

138) This chapter of the ES considered the potential community and health effects associated with construction and operation of the Proposed Bowland Section. Disturbance and severance effects were assessed across four community areas: Newton-in-Bowland, Tatham, Roeburndale and Wray with Botton. Health effects and tourism accommodation effects were assessed for the RCAA.

139) During enabling and construction works, all community areas would be expected to experience some disturbance effects because of a combination of landscape and visual, noise, and traffic effects. However, based on the mitigation proposed within the CCoP and CTMP, the overall disturbance effect for receptors within the LCAAs was assessed as not significant. For communities outside of the LCAA located on construction traffic routes where off-site highway works may also additionally be required, the nature, duration and volume of traffic has the potential to give rise to significant disturbance effects. Disturbance effects during commissioning and operation were assessed as not significant for all communities.

140) The assessment also considered the ability of communities to access agricultural land, property, infrastructure, businesses, and community facilities, as a result of new infrastructure, road closures, or delays imposed by traffic management measures. For all communities, severance effects were assessed as either negligible or slight adverse and not significant.

141) Similarly, based on the estimated peak workforce and the bedspace capacity within the RCAA, effects on tourism accommodation were considered not significant.

142) The health assessment, presented in Appendix 14.1: Health Assessment, considered health outcomes within the context of the RCAA. During the enabling works, construction and commissioning phases, the potential for adverse health outcomes was identified in connection with adverse landscape and visual effects and impacts on natural capital – a biological heritage, site and community disturbance. No significant health effects were triggered by these health determinants.

14.10 Glossary and Key Terms

143) Key phrases and terms used within this technical chapter relating to Communities and Health are defined within Appendix 1.2: Glossary and Key Terms.