A1 in Northumberland: Morpeth to Ellingham

Scheme Number: TR010041

6.3 Environmental Statement – Chapter 15 Assessment of Combined Effects

Part B

APFP Regulation 5(2)(a)

Planning Act 2008

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

June 2020

Infrastructure Planning

Planning Act 2008

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

The A1 in Northumberland: Morpeth to Ellingham

Development Consent Order 20[xx]

Environmental Statement

Regulation Reference:	APFP Regulation 5(2)(a)
Planning Inspectorate Scheme Reference	TR010041
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Rev 0	June 2020	Application Issue

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TABLES

15 ASSESSMENT OF COMBINED EFFECTS

15.1 INTRODUCTION

15.1.1. This chapter reports the likely significant combined environmental effects associated with Part B: Alnwick to Ellingham (Part B).

15.1.2. This chapter assesses combined effects, which occur due to impacts from different environmental topics associated with Part B combining to cause multiple effects on a single receptor. For example, a residential receptor may be affected by noise, air quality and visual effects from Part B.

15.2 COMPETENT EXPERT EVIDENCE

15.2.1. **Table 15-1** below demonstrates that the professionals contributing to the production of this chapter have sufficient expertise to ensure the completeness and quality of this assessment.

Table 15-1 – Relevant Experience

Name	Role	Qualifications and Professional Membership	Experience
Nicola Townley	Author	BSc (Hons) in Environmental Management MSc in Environmental Impact Assessment and Management Graduate Member of the Institute of Environmental Management and Assessment (IEMA	Assistant Consultant 1 and a half years' experience in environmental consulting relating to the preparation and coordination of Environmental Impact Assessments (EIAs). Other recent relevant experience includes: - Assistant to the environment lead for Alwoodley Gates Park and Ride EIA including author of the assessment of cumulative effects chapter for the Environmental Statement (ES).
Victoria Wilson	Author	BSc (Hons) Ecology MSc Environmental Analysis and Assessment Full Member of the Institute of Environmental	Associate 20 years' experience in environmental regulation, and assessment and management of engineering schemes. Other recent relevant experience includes:

Name	Role	Qualifications and Professional Membership	Experience
		Management and Assessment (IEMA) Chartered Environmentalist (CEnv)	- Environmental assessment lead for the A19 Norton to Wynyard improvement scheme for preliminary design stage - Environmental assessment lead for several strategic road studies including: - Trans-Pennine Tunnel: Wider Transport Connectivity Assessment; and - Oxford to Cambridge Expressway - Environmental Impact Assessment (EIA) Project Manager for A45 Daventry Development Link for Northamptonshire County Council
Kevin Stubbs	Reviewer	Higher National Diploma in Rural Resources and their Management MA in Landscape Management Chartered Member of the Landscape Institute Member of the Chartered Institute of Ecology and Environmental Management (CIEEM)	Technical Director 30 years' experience in the environmental sector. Other recent relevant experience includes: - Technical Director for the A1 Birtley to Coalhouse scheme for Options Identification, Options Selection and preliminary design stage. - Environment Technical Director for A19/A1058 Coast Road Improvement and A19 Norton to Wynyard Improvements (preliminary design stage). - Environment Technical Director for A1 Scotswood to North Brunton Improvement scheme (option identification and option selection stage).

15.3 LEGISLATIVE AND POLICY FRAMEWORK

LEGISLATION

Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (EIA Regulations)

15.3.1. Paragraph 5, Schedule 4 of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations) (**Ref. 15.1**) requires that an Environmental Statement (ES) includes:

"The description of the likely significant effects on the factors specified in regulation 5(2) should cover the direct effects of any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development"

POLICY

15.3.2. National policy relevant to the potential combined effects is outlined in **Table 15-2** below. There are no relevant local policies.

Table 15-2 – National Planning Policy relevant to the Assessment of Combined Effects

Policy	Relevant Policy Objectives	Significance of Part B on Policy Objective
National Policy Statement for National Networks (NPS NN) (**Ref. 15.2**)	Paragraph 4.17 of the NPS NN states: "*The Examining Authority should consider how significant cumulative effects and the interrelationship between effects might affect the environment, even though they may be acceptable when considered on an individual basis with mitigation measures in place.*"	An assessment of combined effects has been carried out in accordance with the requirements of the policy. **Section 15.8** presents a description of the significance of combined effects on Part B.

15.4 ASSESSMENT METHODOLOGY

15.4.1. The potential combined effects associated with Part B have been considered for the topics in **Technical Chapters 5** to **13** of this ES and are provided in this chapter.

15.4.2. The assessment methodologies are based on the guidance documents detailed in **Section 15.4** below, and previous professional experience from other similar highways schemes. They take into account the types of receptors assessed, the nature of Part B and the environmental information available to inform the assessment.

SCOPE OF ASSESSMENT

15.4.3. The scope of the combined assessment is in line with the **Scoping Report** (**Application Document Reference: TR010041/APP/6.11**) and **Scoping Opinion** (**Application Document Reference: TR010041/APP/6.13**). **Appendix 4.1**: **Scoping Opinion Response Tracker**, **Volume 1** of this ES (**Application Document Reference: TR010041/APP/6.1**) presents commentary of how each item within the Scoping Opinion has been addressed within this ES.

15.4.4. Topics assessed in the **Technical Chapters 5 to 13** of this ES in relation to Part B have been scoped into the assessment of combined effects.

15.4.5. In relation to **Chapter 14: Climate** of this ES, the impacts of greenhouse gases (GHG) emissions, in terms of their contribution to climate change, are global and cumulative in nature, with every tonne contributing to impacts on natural and human systems. GHGs are natural and anthropogenic gases occurring in the atmosphere that absorb and emit infrared radiation, thereby maintaining the sun's energy within the earth's atmosphere. There is an overwhelming scientific consensus that the major increase in the atmospheric concentration of GHGs since the industrial revolution, is contributing to climate change. It is the increase in concentrations of GHGs in the global atmosphere due to all GHG causing human activities that cause climate change. As such it is the combined effect of all GHG-emitting human activities that cause climate change, and therefore the assessment of the GHGs due to Part B assesses the combined effect of GHG emissions. Therefore, the quantification of emissions from Part B in the assessment of significance or effects inherently assesses the combined impacts. No further assessment has therefore been undertaken in this chapter. The resilience assessment looks at the potential impacts of environmental change on Part B impacts of Part B on the environment: the receptor for the resilience assessment is Part B . As such, no assessment of combined effects for climate has been made as there are no receptors in common with other assessments. No other combined effects have been identified.

15.4.6. The Main Compound would be used by both Part A: Morpeth to Felton (Part A) and Part B and is located within the Order Limits of Part A. The potential for additional effects of using the Main Compound for Part B has been considered for each environmental topic (refer to **Table 4-6** in **Chapter 4: Environmental Assessment Methodology**, **Volume 1** of this ES (**Application Document Reference: TR010041/APP/6.1**)). As no additional effects have been identified, there would be no combined effects in relation to the Main compound for Part B.

METHODOLOGY FOR THE ASSESSMENT OF COMBINED EFFECTS

15.4.7. The approach to the assessment of combined effects considers the changes in baseline conditions at common sensitive receptors identified within the ES for Part B i.e. those receptors that have been assessed by more than one technical topic in this ES, during construction and operation of Part B. For the purposes of assessment, these common sensitive receptors identified within this ES have then been grouped based upon their

shared attributes, characteristics or features i.e. residents, road users or agricultural land. In determining whether an effect is considered significant, effects of 'minor' or above significance are taken into consideration, to account for the potential for multiple 'non-significant effects' to combine to result in an overall significant effect. For example, the potential for minor (non-significant) effects to result in a moderate (significant) effect.

15.4.8. In determining the significance of effect for each category of common receptors, the assessment considers the worst-case effects reported in **Technical Chapters 5** to **13** of this ES for receptors relevant to each respective common receptor group. For example, in the category 'Users of Public Rights of Way (PRoW) (walkers, cyclists and horse riders (WCH))', **Chapter 7: Landscape and Visual** and **Chapter 12: Population and Human Health** of this ES respectively assesses the effects upon PRoW and reports a range of different significance of effects for each PRoW. This assessment therefore considers the highest level of significance reported for each common receptor. Therefore, the overall significance of effect reported in **Table 15-4** reports worst-case combined effects for each common receptor group.

SIGNIFICANCE OF EFFECTS

15.4.9. Although the ES, unless otherwise stated, considers effects of moderate or above significance as a 'significant effect' in terms of the EIA Regulations (as stated in **Section 4.5** in **Chapter 4: Environmental Assessment Methodology**, **Volume 1** of this ES (**Application Document Reference: TR010041/APP/6.1**)), this combined assessment considers effects of minor significance or above to assess whether multiple effects of minor significance (i.e. those which are not considered significant in terms of the EIA Regulations) could combine to result in a significant combined effect. Effects of negligible significance have been excluded in this assessment as, by virtue of their definition, their measurable effect is not considered to have the potential to result in a significant combined effect.

15.4.10. The following factors have been considered in determining the significance of combined effects, in accordance with the Design Manual for Roads and Bridges (DMRB), Volume 11 Section 2 Part 5 Section IV (**Ref. 15.3**):

a. Which receptors/resources are affected?
b. How will the activity or activities affect the condition of the receptor/resource?
c. What are the probabilities of such effects occurring?
d. What ability does the receptor/resource have to absorb further effects before change becomes irreversible?

15.4.11. The significance of combined effects has then been determined using professional judgement based on the following criteria, which are set out in DMRB (**Ref. 15.3**) and defined **Table 15-3** below.

Table 15-3 – Combined Significance of Effect Definition

Significance	Effect
Severe	Effects that the decision-maker must take into account as the receptor/resource is irretrievably comprised.
Major	Effects that may become key decision-making issue.
Moderate	Effects that are unlikely to become issues on whether the project design should be selected, but where future work may be needed to improve on current performance.
Minor	Effects that are locally significant.
Not Significant	Effects that are beyond the current forecasting ability or are within the ability of the resource to absorb such change.

GUIDANCE

15.4.12. The following guidance documents have been used to inform the methodology for this assessment:

a. DMRB, Volume 11 Section 2, Part 5 (**Ref. 15.3**).
b. The Planning Inspectorate Advice Note Seventeen - Cumulative Effects Assessment (**Ref. 15.4**). This guidance sets out a staged process for the assessment of cumulative effects for an ES.

Updated DMRB guidance

15.4.13. DMRB, Volume 11 Section 2, Part 5 (**Ref. 15.3**) has been superseded by DMRB LA 104 (**Ref. 15.5**). As detailed in **Appendix 4.5: DMRB Sensitivity Test**, **Volume 1** of this ES (**Application Document Reference: TR010041/APP/6.1**), the combined effects assessment complies with the changes in LA 104. Therefore, the conclusions presented in this chapter would remain unchanged with the implementation of the updated DMRB guidance for the combined effects assessment (LA 104).

15.4.14. However, the combined effects assessment is based on the outcomes of the technical assessments as detailed in the Part B **Technical Chapters 5** to **13** of this ES. Therefore, if the updated DMRB guidance for these assessments would change the outcomes of the technical assessments, this could change the outcomes of the combined effects assessments. A DMRB sensitivity test has therefore been undertaken in order to determine whether the updated DMRB guidance would change the outcomes of the combined effects assessment due to changes in the outcomes of the technical assessments. This DMRB sensitivity test is presented in **Section 15.8** of this chapter.

15.5 ASSUMPTIONS AND LIMITATIONS

15.5.1. The assessment of combined effects resulting from Part B has focused on the residual effects from the construction and operational stage following the implementation of mitigation measures. There is an assumption that all proposed mitigation measures identified in **Technical Chapters 5** to **13** of this ES, would be secured and delivered through the relevant consenting or permitting regimes.

15.6 STUDY AREA

15.6.1. The Study Areas used for the combined assessment will be the same as those identified within each of the **Technical Chapters 5 to 13** of this ES. The assessment considers the potential combined effects where the Study Areas of the **Technical Chapters 5** to **13** of this ES overlap.

15.7 BASELINE CONDITIONS

15.7.1. The baseline for the combined effects is described in the **Technical Chapters 5** to **13** of this ES.

15.8 ASSESSMENT OF COMBINED EFFECTS

15.8.1. A review of the technical assessments reported in **Technical Chapters 5** to **13,** of this ES has been undertaken to identify environmental effects and therefore those that could combine to result in an effect of greater significance. These combined effect interactions are detailed in **Table 15-4** below.

Table 15-4 – Matrix of Combined Effect Interactions

Common Sensitive Receptors	Impacts	Air Quality	Noise and Vibration	Landscape and Visual	Cultural Heritage	Biodiversity	Road Drainage and Water	Geology and Soils	Population and Human Health	Material Resources	Combined Effect
CONSTRUCTION											
Residents	- Changes to air quality within 200 m of construction activities. - Increased noise and vibration levels within 300 m of construction activities. - Changes to views due to temporary reduction in roadside vegetation screening and changes to views. - Community severance and reduced access to PRoW during diversions. - Potential for socio-economic benefits for residents during construction. - Impacts to human health e.g. inhalation of construction dust and increase in driver stress. - Impact to residents from permanent loss of private property (Charlton Mires Farm and East Cottage)	ü	ü	ü					ü		Mitigation measures relating to potential effects on residents are set out in the respective **Technical Chapters 5 to 13** of this ES and presented in the **Outline Construction Environmental Management Plan (Outline CEMP)** (**Application Document Reference: TR010041/APP/7.3**). Part B would have moderate to large adverse visual residual effects on residents closest to Part B during construction and a slight adverse effect on residents due to temporary disruption, change in access to the A1 and proximity to construction activities. There would also be a slight to moderate adverse effect due to community severance and reduced access to PRoW and a minor beneficial effect from socio-economic effects during construction. When considering the air quality, noise and vibration as well as population and human health effects (including the loss of private property) along with the visual effects, Part B would have a combined temporary, residual effect of **large adverse** significance on residents closest to Part B during construction.
Road users	- Changes to views because of temporary reduction in roadside vegetation screening and construction activities. - Changes to driver stress due to the implementation of traffic management systems along the A1 and connecting side roads and an increase in Heavy Goods Vehicles on the road network due to the construction works. - Impacts to human health e.g. driver/user stress.			ü					ü		Mitigation measures relating to potential effects on road users are set out in the respective **Technical Chapters 5 to 13** of this ES and presented in the **Outline CEMP** (**Application Document Reference: TR010041/APP/7.3**). Part B would have moderate adverse visual residual effects on road users and no overall change to the level of driver stress during construction. When considering the population and human health and visual effects together, Part B would have a combined temporary effect of **moderate adverse** significance on road users during construction.

Common Sensitive Receptors	Impacts	Air Quality	Noise and Vibration	Landscape and Visual	Cultural Heritage	Biodiversity	Road Drainage and Water	Geology and Soils	Population and Human Health	Material Resources	Combined Effect
Users of PRoW (WCH)	- Changes to air quality within 200 m of construction activities. - Increased noise and vibration levels within 300 m of construction activities. - Changes to views due to temporary reduction in roadside vegetation screening and appearance of construction compounds and construction associated machinery. - Community severance and reduced access to PRoW during diversions. - Impacts on the use and enjoyment of PRoW (amenity value). - Impacts to human health e.g. inhalation of construction dust.	ü	ü	ü					ü		Mitigation measures relating to potential effects on PRoW users are set out in the respective **Technical Chapters 5 to 13** of this ES and presented in the **Outline CEMP** (**Application Document Reference: TR010041/APP/7.3**). Part B would have slight to large adverse visual residual effects on PRoW users, a slight to moderate adverse effect on community severance and a moderate adverse effect from the diversion and/or closure of PRoWs during construction. When considering the air quality, noise and vibration, population and human health and visual effects together, the combined effect would be of **large adverse** significance on PRoW users during construction.
Statutory and non - statutory designated ecological sites/local biodiversity	- Changes to air quality within 200 m of construction activities and construction traffic routes. - Increased noise and vibration levels within 300 m of construction activities. - Loss of trees, vegetation and impact on the connectivity of wildlife corridors. - Impacts to the ecological quality of watercourses associated with works within or near watercourses e.g. due to the installation and alteration of culverts.	ü	ü			ü	ü				Mitigation measures relating to potential effects on ecological receptors are set out in the respective **Technical Chapters 5 to 13** of this ES and presented in the **Outline CEMP** (**Application Document Reference: TR010041/APP/7.3**). Part B would have negligible effects on European designated sites, as well as statutory and non-designated sites. Part B is anticipated to have a moderate adverse effect on fish due to the loss of watercourse habitat associated with the installation and alteration of culverts. Part B is also anticipated to have a moderate beneficial effect due to the reinstatement/creation of compensatory woodland (10.41 ha created in comparison to 0.69 ha lost as part of Part B). Part B would have negligible effects on ecological habitats, including watercourses, due to dust deposition, noise and pollution events during construction with the implementation of mitigation. When considering the biodiversity, air quality, noise and vibration and road drainage and water environment effects together, the combined effect would be of **moderate adverse** and

Common Sensitive Receptors	Impacts	Air Quality	Noise and Vibration	Landscape and Visual	Cultural Heritage	Biodiversity	Road Drainage and Water	Geology and Soils	Population and Human Health	Material Resources	Combined Effect
											moderate beneficial significance on ecological receptors during construction.
Commercial properties	- Changes to air quality within 200 m of construction activities. - Increased noise and vibration levels within 300 m of construction activities respectively. - Potential temporary disruption of access to businesses including, for example, Charlton Hall. - Amenity impacts due to the proximity of construction to commercial properties.	ü	ü	ü					ü		Mitigation measures relating to potential effects on commercial properties are set out in the respective **Technical Chapters 5 to 13** of this ES and presented in the **Outline CEMP** (**Application Document Reference: TR010041/APP/7.3**). Part B is not anticipated to have a significant visual effect on commercial properties (Charlton Hall and Blossom Plantation Pods). Part B is anticipated to have slight adverse effects on access to commercial properties during construction. When considering the air quality, noise and vibration, population and human health and visual effects together, the combined effect would be of **slight adverse** significance (**not significant**) on commercial properties during construction.
Agricultural Land and associated rural enterprises	- Part B would result in the temporary loss of agricultural land for construction compounds etc and permanent loss of agricultural land within the Order Limits. - Temporary and permanent impacts on existing farm and diversified rural businesses along the route.							ü	ü		Mitigation measures relating to potential effects on agricultural land and rural enterprises are set out in the respective **Technical Chapters 5 to 13** of this ES and presented in the **Outline CEMP** (**Application Document Reference: TR010041/APP/7.3**). Part B is anticipated to have significant permanent adverse effects on Charlton Mires Farm and East Cottage, and on the loss of best and most versatile (BMV) agricultural land. Part B would have large adverse effects overall on Charlton Mires Farm and very large adverse effects overall for East Cottage as these enterprises are to be affected by permanent land take and the demolition of farm buildings. Part B is also anticipated to have a moderate adverse effect on Charlton Mires Farm due to additional land take on a temporary basis. The quality of agricultural land lost from these enterprises was not surveyed during the Agricultural Land Classification survey and has therefore been assumed to be BMV agricultural land (refer to **Chapter 11:Geology**

Common Sensitive Receptors	Impacts	Air Quality	Noise and Vibration	Landscape and Visual	Cultural Heritage	Biodiversity	Road Drainage and Water	Geology and Soils	Population and Human Health	Material Resources	Combined Effect
											and Soils of this ES). Part B would have a moderate or large adverse effect on BMV agricultural land. As such, the combined effect of Part B on identified rural enterprises due to the temporary and permanent loss of BMV land and the demolition of farm buildings would be of **very large adverse** significance during construction. No further effects on agricultural land or rural enterprises have been identified during operation of Part B.
OPERATION											
Residents	- Exposure to increased pollution (NO_2 and PM_{10}) from changes to traffic flow, mix and speed. - Both an experienced increase and reduction in noise across Part B. - Changes to views to a number of properties due to the loss of existing vegetation, newly established structures (e.g. Charlton Mires Junction) and proposed vegetation planting as part of Part B. - Improved safety for residents using Part B due to an additional lane for safe overtaking, grade separated junctions and removal of direct accesses on to the A1. - Reduced traffic congestion along the carriageway is likely to reduce journey times and driver stress. - Safer accesses to residential properties as there would be no direct accesses on to the A1. However, in some instances, new accesses would require residents to travel a longer distance to and from the A1.	ü	ü	ü					ü		Mitigation measures relating to potential effects on residents are set out in the respective **Technical Chapters 5 to 13** of this ES and presented in the **Outline CEMP** (**Application Document Reference: TR010041/APP/7.3**). Part B would have neutral to moderate adverse visual residual effects on residents closest to Part B during operation, some of which are anticipated to reduce to slight adverse at the design year (2038). Part B would also have minor adverse effects on human health, slight to major beneficial effects in relation to noise, slight beneficial to moderate adverse effects on PRoWs and no significant change in driver stress. When considering the air quality, noise and vibration, population and human health and visual effects together, the combined effect would range from **major beneficial** to **moderate adverse** significance effects on residents during operation.

Common Sensitive Receptors	Impacts	Air Quality	Noise and Vibration	Landscape and Visual	Cultural Heritage	Biodiversity	Road Drainage and Water	Geology and Soils	Population and Human Health	Material Resources	Combined Effect
	- Proposed improvements and negative impacts to existing PRoWs e.g. increased journey times. - Potential beneficial and adverse impacts in health by noise levels depending on receptor location.										
Road users	- Changes to views along the existing and surrounding road network, due to the loss of existing vegetation, newly established structures (e.g. Charlton Mires Junction) and proposed vegetation planting as part of Part B. - Reduced traffic congestion along the carriageway is likely to improve safety, journey times and improving driver/user stress for route users. - Potential improvements in health by reduced congestion along with improved community connectivity.			ü					ü		Mitigation measures relating to potential effects on road users are set out in the respective **Technical Chapters 5 to 13** of this ES and presented in the **Outline CEMP** (**Application Document Reference: TR010041/APP/7.3**). Part B would have slight adverse visual residual effects on road users during the design year (2038) and no significant change to driver stress. When considering population and human health and visual effects together, the combined effect of Part B would range from **Negligible** to **slight adverse** significance (**not significant**) effects on road users during operation.
Users of PRoW (WCH)	- Exposure to increased pollution (NO_2 and PM_{10}) from changes to traffic flow, mix and speed. - Both a predicted increase and reduction in noise levels depending on PRoW location. - Changes to views along recreational routes, due to the loss of existing vegetation, newly established structures (e.g. Charlton Mires Junction) and proposed vegetation planting as part of Part B. - Impacts on the use and enjoyment of PRoW (amenity value).	ü	ü	ü					ü		Mitigation measures relating to potential effects on PRoW are set out in the respective **Technical Chapters 5 to 13** of this ES and presented in the **Outline CEMP** (**Application Document Reference: TR010041/APP/7.3**). Part B would have neutral to slight adverse visual residual effects on PRoW users during the design year (2038) and slight beneficial to moderate adverse effects on community severance. When considering the air quality, noise and vibration, population and human health and visual effects together, the combined effect would range from **slight beneficial** to **moderate adverse** significance effects on PRoW users during operation.

Common Sensitive Receptors	Impacts	Air Quality	Noise and Vibration	Landscape and Visual	Cultural Heritage	Biodiversity	Road Drainage and Water	Geology and Soils	Population and Human Health	Material Resources	Combined Effect
	- Proposed diversions resulting in negative impacts to existing PRoWs e.g. increased journey times but safer access for WCH. - Potential improvements in health by reduced congestion along with improved community connectivity.										
Statutory and non - statutory designated ecological sites/local biodiversity	- Exposure to increased pollution (NO_X) from changes to traffic flow, mix and speed on designated sites and local biodiversity. - Increased noise levels during operation would result in a disturbance impact on the local biodiversity.	ü	ü			ü					Mitigation measures relating to potential effects on ecological receptors are set out in the respective **Technical Chapters 5 to 13** of this ES and presented in the **Outline CEMP** (**Application Document Reference: TR010041/APP/7.3**). Part B would have no effects on European designated sites, as well as statutory and non-designated sites due to changes in air quality and noise. When considering biodiversity, air quality, and noise and vibration there would be no combined effect (**not significant**) on ecological receptors during operation.
Commercial properties	- Reduced traffic congestion along the carriageway is likely to reduce journey times and driver stress. - Lengthened journey times for travellers from the south towards Charlton Hall due to the introduction of diversions to Charlton Mires Junction and access tracks to access the properties. - Improved safety for visitors travelling south to the north to commercial properties e.g. Charlton Hall as Charlton Mires Junction prevents travellers negotiating a junction direct on the A1. - Exposure to increased pollution (NO_2 and PM_{10}) from changes to traffic flow, mix and speed.	ü	ü	ü					ü		Mitigation measures relating to potential effects on commercial properties are set out in the respective **Technical Chapters 5 to 13** of this ES and presented in the **Outline CEMP** (**Application Document Reference: TR010041/APP/7.3**). Part B is not anticipated to have a significant visual effect on commercial properties (Charlton Hall and Blossom Plantation Pods). Part B is anticipated to have slight adverse effects on access to commercial properties. When considering the air quality, noise and vibration, population and human health and visual effects together, the combined effect would be of **slight adverse** significance (**not significant**) on commercial properties during operation.

Common Sensitive Receptors	Impacts	Air Quality	Noise and Vibration	Landscape and Visual	Cultural Heritage	Biodiversity	Road Drainage and Water	Geology and Soils	Population and Human Health	Material Resources	Combined Effect
	- Both an experienced increase and reduction in noise across Part B. - Changes to views to a number of properties due to the loss of existing vegetation, newly established structures (e.g. Charlton Mires Junction) and proposed vegetation planting as part of Part B. - Potential beneficial and adverse impacts in health by noise levels depending on receptor location.										

UPDATED DMRB GUIDANCE

15.8.2. When considering the updated DMRB guidance, a number of environmental effects that arise from Part B would have an increased significance. This DMRB sensitivity test considers the additional significant effects identified as part of the DMRB sensitivity test for Part B **Technical Chapter 5 to 13** (refer to **Appendix 4.5: DMRB Sensitivity Test**, **Volume 1** of this ES (**Application Document Reference: TR010041/APP/6.1**) and whether these significant effects would change the outcome of the combined effects assessment. With the application of the updated DMRB guidance, the effect on Grade 3b agricultural land which was previously assessed as **slight adverse** (**not significant**) would be assessed as **moderate adverse**. However, this would not change the overall conclusions of the geology and soils assessment because agricultural soils were previously assessed as significant overall. Therefore, this would not change the combined effect on agricultural land and associated rural enterprises during the construction of Part B, which is **very large adverse**.

15.8.3. In addition, an existing beneficial significant effect for noise would increase from **moderate beneficial** to **major beneficial.** However, this would not change the combined effects assessment for residents during operation, which is **major beneficial** to **moderate adverse** significance.

15.9 MITIGATION AND MONITORING

15.9.1. Following best practice and the mitigation measures outlined in the **Outline CEMP** (**Application Document Reference: TR010041/APP/7.3**), no further likely combined significant residual effects have been identified above the level of significance of those reported for Part B alone. Therefore, no further mitigation or monitoring is required.

REFERENCES

Ref. 15.1 – Infrastructure Planning (Environmental Impact Assessment) Regulation 2017

Ref. 15.2 – Department for Transport (2014) National Policy Statement for National Networks: Presented to Parliament pursuant to Section 9 (8) and Section 5 (4) of the Planning Act. Department for Transport (2008) National Policy Statement for National Networks [online]. Available at:https://www.gov.uk/government/publications/national-policy-statement-for-national-networks (accessed 26 October 2018).

Ref. 15.3 – Highways England (2008) Design Manual for Roads and Bridges Volume 11, Section 2, Part 5 Assessment and Management of Environmental Effects. HA205/08.

Ref. 15.4 – The Planning Inspectorate (2015) Advice Note Seventeen. Cumulative Effects Assessment relevant to Nationally Significant Infrastructure Project [online]. Available at: https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/2015/12/Advice-note-17V4.pdf (accessed 26 October 2018).

Ref. 15.5 - Highways England (2019) Design Manual for Roads and Bridges, LA 104 Environmental Assessment and Monitoring. Available at: https://standardsforhighways.co.uk/dmrb/search?discipline=SUSTAINABILITY_AND_ENVIRONMENT

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