

A1 Birtley to Coal House

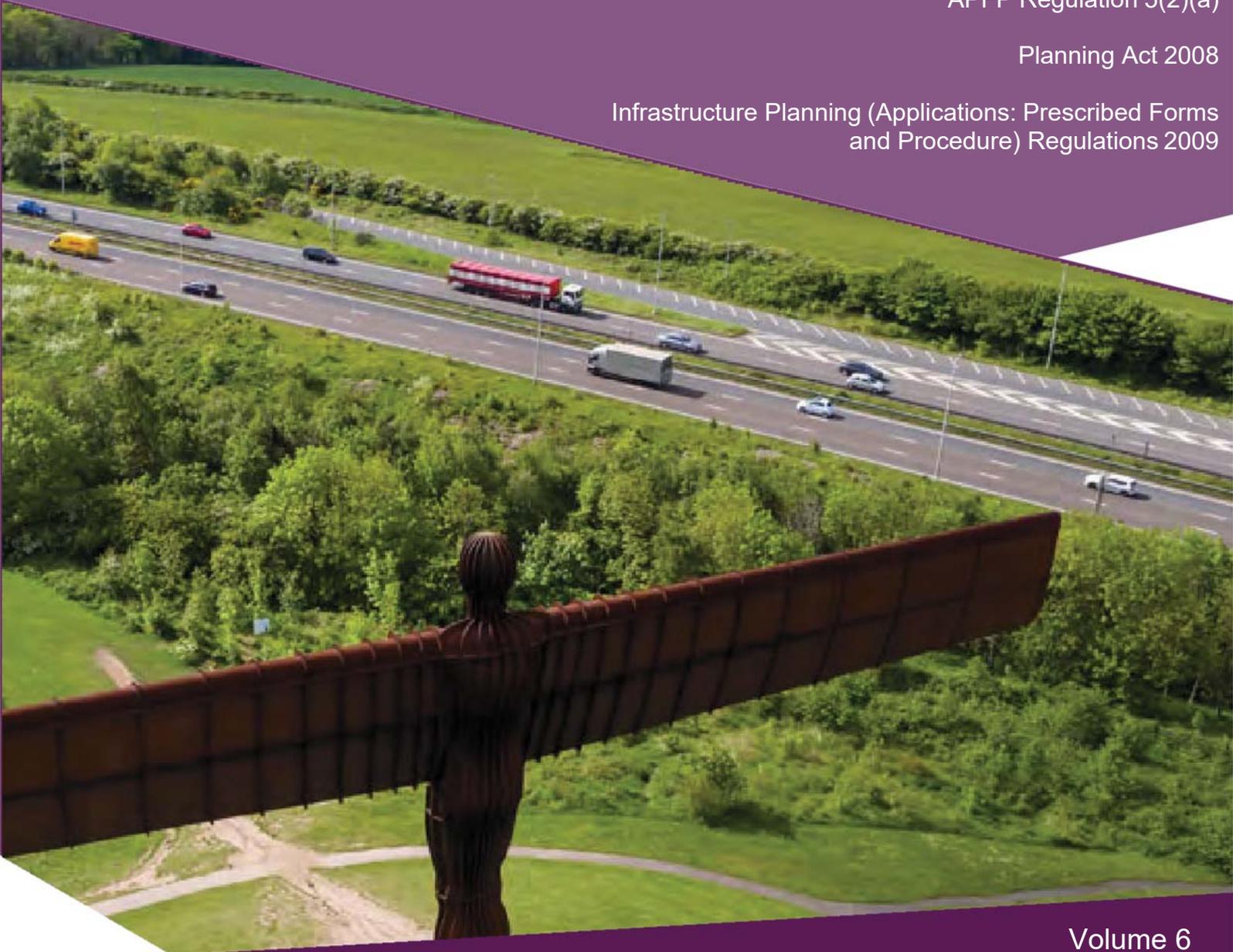
Scheme Number: TR010031

6.1 Environmental Statement Chapter 15 Cumulative and Combined Assessment

APFP Regulation 5(2)(a)

Planning Act 2008

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



Infrastructure Planning

Planning Act 2008

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

**A1 Birtley to Coal House
Development Consent Order 20[xx]**

Environmental Statement

Regulation Reference:	APFP Regulation 5(2)(a)
Planning Inspectorate Scheme Reference	TR010031
Application Document Reference	TR010031/APP/6.1
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Version	Date	Status of Version
Rev 0	14 August 2019	Application Issue

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15. CUMULATIVE AND COMBINED ASSESSMENT

15.1. INTRODUCTION

15.1.1. This chapter reports the likely significant cumulative environmental effects associated with the Scheme.

15.1.2. The following types of cumulative effects are assessed within this chapter:

- a. Combined effects** - occur due to impacts from different environmental topics within the Scheme which are combined to cause multiple effects on a single receptor. For example, a residential receptor may be affected by noise, air quality and visual effects from the Scheme.
- b. Cumulative effects** - occur due to of the impacts of the Scheme interacting with the impacts from other schemes in the vicinity of a receptor. For example, a residential receptor may be affected by noise from more than one scheme.

Allerdene Bridge Options

15.1.3. Consideration has been given to both the Allerdene embankment option and Allerdene viaduct option, as detailed in **paragraphs 2.7.11 to 2.7.18** of this ES, within the Environmental Impact Assessment (EIA). Consultation has taken place with the EIA specialists and it has been confirmed that any differences in the effects associated with the Allerdene Bridge options are localised and in the context of the cumulative assessment would present marginal differences or no difference at all. For the purposes of the cumulative effects assessment, it is therefore considered that there is no difference between the Allerdene embankment option and Allerdene viaduct option.

15.2. COMPETENT EXPERT EVIDENCE

15.2.1. The competence of those persons involved in the production of this Environmental Statement (ES) chapter are set out in **Table 15-1**.

Table 15-1 – Cumulative assessment professional competence

Name	Role	Qualifications and Professional Membership	Experience
Jodie Rothwell	Author	BSc (Hons) Oceanography MSc Environmental Consultancy IEMA Practitioner	Six years professional work experience in the field of Environmental Impact Assessment (EIA) specialising in highways projects. Jodie has previously completed: <ul style="list-style-type: none"> - The Combined and Cumulative Assessment for the Scheme at Option Selection Stage of the A1 Birtley to Coal House Scheme.

Name	Role	Qualifications and Professional Membership	Experience
			<ul style="list-style-type: none"> - Assisted on the Cumulative effects assessment Triton Knoll Offshore Wind Farm and Electrical Infrastructure National Significant Infrastructure Project (NSIP).
David Hoare	Reviewer	BSc Geography MSc Ecology and Environmental Management Chartered Environmentalist IEMA Practitioner MCIEEM	Over 18 years' experience in the environment sector, 17 of which have been spent in environmental consultancy. David has been the Environmental Lead for a number of Highways England schemes, including: <ul style="list-style-type: none"> - M4 J3-12 Smart Motorway (Stages 3-5) - Trans-Pennine Upgrade (Stages 1-3) - Trans-Pennine Tunnel study (Stage 0)

15.3. LEGISLATIVE AND POLICY FRAMEWORK

LEGISLATION

15.3.1. The applicable legislative framework is summarised as follows:

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

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

- a.** *“A description of the likely significant effects of the development on the environment resulting from, inter alia-the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources.*
- b.** *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

15.3.3. National policy relevant to the potential cumulative effects is outlined in **Table 15-2**.

Table 15-2 – Assessment of the scheme against national policies and plans relevant to cumulative effects

Policy	Relevant policy objectives	Significance of impact of the Scheme on policy objective
<p>National Policy Statement for National Networks (NPS NN) (Ref 15.2)</p>	<p>Paragraph 4.17 of the NPS NN states:</p> <p><i>“When considering significant cumulative effects, any environmental statement should provide information on how the effects of the applicant’s proposal would combine and interact with the effects of other development (including projects for which consent has been granted, as well as those already in existence)”.</i></p> <p>Paragraph 4.17 of the NPS NN further states:</p> <p><i>“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”.</i></p>	<p>An assessment of cumulative 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 the Scheme. Table 15-9 presents a description of the significant of cumulative effects on the Scheme.</p>

15.4. ASSESSMENT METHODOLOGY

15.4.1. The potential combined and cumulative effects associated with the Scheme have been considered for the topics in **Chapters 5-14** of this ES and are provided in this chapter.

15.4.2. The assessment methodologies are based on the guidance documents detailed in **paragraph 15.4.31** and demonstrate previous experience, the types of receptors assessed, the nature of the Scheme and the environmental information available to inform the assessment.

SCOPE OF ASSESSMENT

15.4.3. **Chapters 5-13** of the ES (**Application Document Reference: TR010031/APP/6.1**) have been scoped into the assessment of combined and cumulative effects.

15.4.4. In relation to **Chapter 14 Climate** of this ES (**Application Document Reference: TR010031/APP/6.1**), the impacts of greenhouse gas (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. Therefore, the quantification of emissions from the project in the assessment of significance or effects inherently assesses the combined and cumulative impacts. No further assessment will be required in this chapter. The resilience assessment looks at the potential impacts of environmental change on the Scheme, rather than impacts of the Scheme on the environment: the receptor for the resilience assessment is the Scheme. As such, no assessment of combined effects has been made as there are no receptors in common with other assessments. In terms of cumulative effects, the effect of other proposed developments in the vicinity of the Scheme in relation to flood risk have been assessed within **Chapter 13 Road Drainage and the Water** of this ES (**Application Document Reference: TR010031/APP/6.1**). No other cumulative effects have been identified.

15.4.5. The cumulative assessment for Air Quality and Noise topics are already considered in **Chapter 5 Air Quality** and **Chapter 11 Noise and Vibration** assessments of this ES (**Application Document Reference: TR010031/APP/6.1**) for the operational phase. As such both assessments have therefore only undertaken a construction cumulative assessment. See **Section 5.8 (Chapter 5 Air Quality)** and **Section 11.8 (Chapter 11 Noise and Vibration)** of this ES (**Application Document Reference: TR010031/APP/6.1**) for their operational assessment for this EIA.

METHODOLOGY FOR THE ASSESSMENT OF COMBINED EFFECTS

15.4.6. The approach to the assessment of combined effects considers the changes in baseline conditions at common sensitive receptors i.e. those receptors that have been assessed by more than one technical topic, due to the Scheme during construction and operation. 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 cumulative effect (for example the potential for minor effects to result in a combined effect).

15.4.7. An overall assessment of the combined effects on the common sensitive receptors identified above has been made using professional judgement and the technical information provided in **Chapters 5-14** of this ES (**Application Document Reference: TR010031/APP/6.1**).

METHODOLOGY FOR THE ASSESSMENT OF CUMULATIVE EFFECTS

15.4.8. The approach to the assessment of cumulative effects considers the deviation from the baseline conditions at common sensitive receptors between the Scheme and one or more other development applications (referred to as 'other developments').

15.4.9. The Scheme's traffic model (**Ref 15.3**) considers 'other developments' in the surrounding region to allow assumptions about traffic growth over time to be made.

15.4.10. The Planning Inspectorate Advice Note Seventeen (**Ref 15.4**) sets out a four-stage approach to the assessment of cumulative effects:

- a. Stage 1: establish the Zone of Influence (ZOI) and long list of 'other developments'
- b. Stage 2: identify short list of 'other developments' for cumulative assessment
- c. Stage 3: information gathering for 'other developments'
- d. Stage 4: assessment of cumulative effects

15.4.11. Further details of these steps are provided below.

Stage 1 - Establish the Zone of Influence and long list of ‘other developments’

Identification of the ZOI

15.4.12. The ZOI for each discipline was established to determine which ‘other developments’ were relevant to each environmental topic. If a receptor was present, and there was also an overlap between the time periods in which the impacts would occur, then the potential for a cumulative effect was considered.

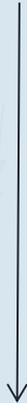
15.4.13. The likely occurrence of a cumulative effect was confirmed in the first instance through the examination of the available environmental information for the ‘other development’, and using professional judgement, to establish whether a receptor was identified as being affected by both developments.

Identification of the Long List

15.4.14. An initial long list of ‘other developments’ was produced (**Appendix 15.1** of this ES (**Application Document Reference: TR010031/APP/6.3**)) based upon the Scheme’s Air Quality and Noise and Vibration Affected Road Network (ARN) and the largest environmental topic Study Area as discussed in **paragraph 15.6.4**. The long list was developed by carrying out a desk study using publicly available online information at the time of writing.

15.4.15. The criteria for ‘other developments’ included in the assessment of cumulative effects is described below in **Table 15-3** and is based upon the Planning Inspectorate Advice Note Seventeen (**Ref 15.4**). This consultation is summarised in **Appendix 4.4** of this ES (**Application Document Reference: TR010031/APP/6.3**).

Table 15-3 - Criteria for identifying ‘other developments’ for inclusion in the assessment of cumulative effects

Tier	Criteria	
Tier 1	<ul style="list-style-type: none"> – Projects under construction – Permitted applications whether under the Planning Act 2008 (PA2008) or other regimes, but not yet implemented. – Submitted applications whether under the PA2008 or other regimes, but not yet determined. 	
Tier 2	<ul style="list-style-type: none"> – Projects on the Planning Inspectorate’s Programme of Projects where a Scoping Report has been submitted. – Potential applications under other regimes where the competent authority has issued a statutory EIA Scoping Opinion and a Scoping Report or Environmental Report is Available. 	
Tier	<ul style="list-style-type: none"> – Projects on the Planning Inspectorate’s Programme of 	

Tier	Criteria	
3	<p>Projects where a Scoping Report has not been submitted.</p> <ul style="list-style-type: none"> – Potential applications under other regimes where the competent authority has not issued a statutory EIA Scoping Opinion and there is no Environmental Report or Scoping Report available. – Identified in the relevant Development Plan (and emerging Development Plans – with appropriate weight being given as they move closer to adoption), recognising that much information on any relevant proposals will be limited. 	to be available

15.4.16. In addition to the ‘other development’ types set out in **Table 15-3**, the following criteria were considered:

- a.** Any local NSIPs (within 2km of the Study Area).
- b.** Applications under other regimes were limited to ‘major applications’ which are defined in the Town and Country Planning (Development Management Procedure) (England) Order 2015 (TCPO) as:
 - i.** The winning and working of minerals or the use of land for mineral-working deposits.
 - ii.** Waste development.
 - iii.** The provision of dwelling houses where:
 - The number of dwelling houses to be provided is 10 or more.
 - iv.** The development is to be carried out on a site having an area of 0.5 hectares or more and it is not known whether the development falls within sub-paragraph (c)(i).
 - The provision of a building or buildings where the floor space to be created by the development is 1,000 square metres or more.
 - Development carried out on a site having an area of 1 hectare or more.

15.4.17. In addition to development applications and allocations, as defined by the Department for Transport’s Transport and Analysis Guidance (TAG) (**Ref 15.5**) the long list also included relevant ‘other developments’ from the ‘Scheme’s traffic model uncertainty log’ (**Ref 15.3**). All developments considered within the modelling process for the Scheme, and the documents from which they have been derived are presented within the ‘Uncertainty Log’. This contains an assessment of the likelihood of any development within the policy documents to be constructed. Based upon guidance within TAG Unit M4 (**Ref 15.5**), the uncertainty log is divided into four key categories:

- a.** Near Certain
- b.** More than Likely
- c.** Reasonably Foreseeable
- d.** Hypothetical

- 15.4.18. Further detail on the above categories classification are described further in **Table 15-4** below.
- 15.4.19. Developments deemed sufficiently certain were included in the ‘core scenario’ for traffic modelling. ‘Other developments’ were only included that were within 2km of the Scheme Footprint.
- 15.4.20. The Scheme’s traffic model included scoping criteria that were used to decide which developments should be included. This was based on the certainty of outcome shown in **Table 15-4**, which was developed in line with TAG guidance (**Ref 15.5**). In order to align with the Scheme’s traffic model, the assessment of cumulative effects included only those developments that were considered as being ‘Near Certain’ and ‘More Than Likely’.

Table 15-4 - Certainty of outcome and development status

Certainty of Outcome	Development Status
Near Certain: The outcome will happen or there is a high probability that it will happen.	<ul style="list-style-type: none"> – Intent announced by proponent to regulatory agencies. – Projects under construction.
More Than likely: The outcome is likely to happen but there is some uncertainty.	<ul style="list-style-type: none"> – Submission of planning or consent application imminent. – Development application within the consent process.
Reasonably Foreseeable: The outcome may happen, but there is significant uncertainty.	<ul style="list-style-type: none"> – Identified within a development plan. – Not directly associated with the transport strategy/scheme, but may occur if the strategy scheme is implemented. – Development conditional upon the transport strategy/scheme proceeding. – Committed policy goal, subject to tests (e.g. of deliverability) whose outcomes are subject to significant uncertainty.
Hypothetical: There is considerable uncertainty whether the outcome will ever happen.	<ul style="list-style-type: none"> – Conjecture based upon currently available information. – One of a number of possible inputs in an initial consultation process. – Policy aspiration.
Near Certain: The outcome will happen or there is a high probability that it will happen.	<ul style="list-style-type: none"> – Intent announced by proponent to regulatory agencies. – Projects under construction.

WSP Traffic Model Uncertainty Log (2018) (**Ref 15.3**)

- 15.4.21. In addition to the above, a search for major applications was undertaken via the Gateshead Council website, this was limited to the following criteria:
- a. Major Applications validated within the three year period (based upon the default period of three years in which to implement a planning permission).
 - b. Consideration of the following type of planning applications:
 - i. Full consent - provides planning permission for a development which can commence following the discharge of conditions outlined in the decision notice.
 - ii. Outline consent - provides permission in principal for the development, however matters of access, design, landscaping, surface water management etc are often excluded and addressed in a separate application for Reserved Matters. This is a secondary application stage where full details of the reserved matters have to be submitted to, and approved by the Local Planning Authority. Conditions will be applied to the granting of the Reserved Matters which themselves will also have to be discharged.
 - iii. Reserved Matters – full details of a permitted development that was granted at outline stage.
 - iv. Hybrid consent - provides full and outline consent applications.
 - c. All planning application types ‘awaiting decision’ and ‘approved’, discounting ‘refused’ planning applications.
- 15.4.22. In October 2018, Gateshead Council were contacted to comment on the long list of ‘other developments’ considered with the assessment of cumulative effects (see **Appendix 4.4** of the ES ((**Application Document Reference: TR010031/APP/6.3**)).
- Stages 2 and 3 - Information Gathering and Identification of a Short List of ‘Other Developments’**
- 15.4.23. The long list developed in Stage 1 was screened to develop a short list of relevant development applications to be considered within the next stage (i.e. Stage 4) of the cumulative effects assessment.
- 15.4.24. Developments were screened out of the long list for the following reasons:
- a. There was too much uncertainty about the project progressing (for example, if an application has a status of ‘unknown’), and therefore of its impacts occurring, to justify its inclusion in the assessment as discussed in **Table 15-4**.
 - b. There was insufficient environmental information such as environmental reports, publicly available information on the ‘other development’, and in particular its environmental effects, to allow an assessment to be undertaken.
 - c. It is confirmed that the temporal scope of the ‘other development’ would mean that it would not act ‘cumulatively’ with the Scheme e.g. construction of the ‘other development’ would be complete prior to the Scheme being built and therefore would be considered as baseline.
 - d. ‘Outline’ applications have not been considered if there is a Full Application for the same site and development.

- 15.4.25. In line with the Planning Inspectorate’s Advice Note Seventeen (**Ref 15.4**), available information was gathered regarding the shortlisted ‘other developments’. This information was gathered from websites of the relevant competent authorities (i.e. Gateshead Council and the Planning Inspectorate). Where required, and possible, this was supplemented by liaising with third parties (such as Local Authorities and relevant applicants/developers).
- 15.4.26. The ‘short list’ is presented in **Appendix 15.2** of this ES (**Application Document Reference: TR010031/APP/6.3**), which details each project’s current status and provides comment regarding the temporal and spatial scope of the ‘other developments’.
- 15.4.27. All the ‘other developments’ identified in **Appendix 15.2** of this ES (**Application Document Reference: TR010031/APP/6.3**) are of such a nature and proximity to the Scheme to have the potential to generate significant cumulative effects when considered in context with the Scheme.

Stage 4 - Assessment of Cumulative Effects

- 15.4.28. For each topic assessment, the short list of ‘other developments’ was filtered to identify those ‘other developments’ as being within each of the environmental topic’s ZOI and having the potential to cause cumulative effects. These are detailed in **Section 15.9, Table 15-8**. A summary of ‘other developments’ identified per topic is provided in **Appendix 15.3** of this ES (**Application Document Reference: TR010031/APP/6.3**).

SIGNIFICANCE OF EFFECTS

- 15.4.29. Although the Scheme’s EIA unless otherwise stated considers effects of moderate or above significance as a ‘significant effect’ in terms of the EIA Regulations 2017 (as stated in **Section 4.6** of this ES), this cumulative 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 2017) could combine to result in a significant cumulative effect.
- 15.4.30. The significance of effect has been determined in accordance with the guidance set out within the Design Manual for Roads and Bridges (DMRB) Volume 11 Section 2 Part 5 Section IV Table 3 (**Ref 15.6**) as defined in **Table 15-5** below.

Table 15-5 – Combined and cumulative 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.

Significance	Effect
Not Significant	Effects that are beyond the current forecasting ability or are within the ability of the resource to absorb such change.

GUIDANCE

- 15.4.31. The following guidance documents have been used to inform the methodology for this assessment:
- a. DMRB, Volume 11 Section 2, Part 5 (**Ref 15.6**).
 - 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 assessment.

15.5. ASSUMPTIONS AND LIMITATIONS

- 15.5.1. The assessment of combined effects and cumulative effects resulting from the Scheme has focused on the residual effects from the construction and operational phase following the implementation of mitigation measures. There is an assumption all proposed mitigation measures identified in **Chapters 5-14** of this ES (**Application Document Reference: TR010031/APP/6.1**) would be secured and delivered through the relevant consenting or permitting regimes.
- 15.5.2. The assessment of cumulative effects has used the most up to date 'other development' information wherever possible and has been limited to publicly available information obtained from the relevant planning applications on the Gateshead Council's public access database (**Ref 15.7**).
- 15.5.3. Any planning applications, status updates or additional information published since the time of writing have not been included within the assessment.
- 15.5.4. Where a planning application has been permitted but no environmental information supports the application, this was excluded from the short list as no environmental assessment could be undertaken.
- 15.5.5. For the assessment of cumulative effects, the determination of whether an application was considered for inclusion in the short list, where construction timescales were not available, a 'worst-case' assumption was taken that the construction timescale of the 'other development' would overlap with the Scheme.

15.6. STUDY AREA

COMBINED EFFECTS

- 15.6.1. The Study Areas used for the combined assessment will be the same as those identified within each of the technical chapters (**Chapters 5 – 14**) of this ES (**Application Document Reference: TR010031/APP/6.1**).

CUMULATIVE EFFECTS

- 15.6.2. The Study Area for 'Stage 1' as detailed in **paragraphs 15.4.12 - 15.4.13** of the assessment of cumulative effects was defined taking account of the relevant topic guidance and the

geographic scope of the potential impacts relevant to each technical chapter (**Chapters 5 – 14**) of the ES (**Application Document Reference: TR010031/APP/6.1**).

- 15.6.3. The 2km Study Area prescribed for the assessment of cumulative effects was based on the largest Study Area (ZOI) within **Chapter 8 Biodiversity** of this ES (**Application Document Reference: TR010031/APP/6.1**).
- 15.6.4. For **Chapter 5 Air Quality** and **Chapter 11 Noise and Vibration** assessment's (**Application Document Reference: TR010031/APP/6.1**), the ARN was used. The ARN was developed for the Scheme's traffic model and covers both the Scheme and the A1 Scotswood to North Brunton Improvement Scheme (hereafter referred to as 'SNB').
- 15.6.5. These Study Areas form the extent of the areas used in the identification of a long list of potentially relevant 'other developments' (see **Figure 15.1 – Study Area** of this ES (**Application Document Reference: TR010031/APP/6.2**)).
- 15.6.6. The extents of the Scheme's ZOI for each environmental topic are described and presented in **Table 15-6**. The ZOIs capture the potential maximum extent for which significant cumulative environmental effects are considered possible. A description and reasoning for each ZOI is also provided in **Table 15-6**.

Table 15-6 - ZOI extents for assessment of cumulative effects

Environmental Topic	Zone of influence (ZOI)
Air Quality	<p>Construction: As reported in Chapter 5 Air Quality (Section 5.6) of this ES (Application Document Reference: TR010031/APP/6.1), the ZOI is 200m from construction activities for construction dust and emissions. A ZOI for construction traffic was determined based on a review of other development proposals and their construction programmes (where available).</p> <p>Operation: The ARN within the traffic model defines the ZOI. As the operational phase traffic data includes traffic associated with other developments, the air quality impact assessment reported in Chapter 5 Air Quality (Section 5.6) of this ES (Application Document Reference: TR010031/APP/6.1) is inherently cumulative.</p>
Cultural Heritage	<p>Construction and Operation: As reported in Chapter 6 Cultural Heritage (Section 6.6) of this ES (Application Document Reference: TR010031/APP/6.1), the ZOI for designated heritage assets and conservation areas is 1km from the Scheme Footprint. The ZOI for non-designated heritage assets and potential archaeological remains is 500m from the Scheme's Footprint.</p>
Landscape and Visual	<p>Construction and Operation: As defined in Chapter 7 Landscape and Visual (Section 7.6) of this ES (Application Document Reference: TR010031/APP/6.1), the ZOI for assessment purposes varies according to the zone of visual influence (ZVI).</p>

Environmental Topic	Zone of influence (ZOI)
Biodiversity	Construction and Operation: As reported in Chapter 8 Biodiversity (Section 8.6) of this ES (Application Document Reference: TR010031/APP/6.1), the ZOI is 2km from the Scheme Footprint for statutory and non-statutory designated sites. Within this, the ZOI for assessment purposes varies according to specific biodiversity receptors.
Geology and Soils	Construction and Operation: As reported in Chapter 9 Geology and Soils (Section 9.6) of this ES (Application Document Reference: TR010031/APP/6.1), the ZOI is defined as 250m from the Scheme Footprint.
Material Resources	Construction and Operation: As reported in Chapter 10 Material Resources (Section 10.6) of this ES (Application Document Reference: TR010031/APP/6.1), the ZOI comprises the Scheme Footprint and the region within which waste management facilities are located and from where construction materials may be sourced.
Noise and Vibration	<p>Construction Noise: As reported in Chapter 11 Noise and Vibration (Section 11.6) of this ES (Application Document Reference: TR010031/APP/6.1), the ZOI has been defined by a 100m buffer (including the proposed carriageway works, structure works and the proposed construction compounds) around the area required during the construction works.</p> <p>Construction Vibration: As reported in Chapter 11 Noise and Vibration (Section 11.6) of this ES (Application Document Reference: TR010031/APP/6.1), the ZOI for construction vibration has been determined in the same way as for construction noise, but with the buffer distance extended from 100m to 200m, such that potential perception of ground borne vibration from percussive ground works (e.g. potential impact piling) is fully accounted for.</p> <p>Operation: The ARN within the traffic model defines the ZOI. As the operational phase traffic data includes traffic associated with other developments, the noise and vibration impact assessment reported in Chapter 11 Noise and Vibration of this ES (Section 11.6) (Application Document Reference: TR010031/APP/6.1) is inherently cumulative.</p>
Population and Human Health	Population and Human Health Construction and Operation: As reported in Chapter 12 Population and Human Health (Section 12.6) of this ES (Application Document Reference: TR010031/APP/6.1), the ZOI varies according to specific population

Environmental Topic	Zone of influence (ZOI)
	<p>and human health receptors.</p> <p>Health Construction and Operation: As reported in Chapter 12 Population and Human Health (paragraph 12.6.11) of this ES (Application Document Reference: TR010031/APP/6.1), the ZOI for the Health assessment is defined by the administrative district (Gateshead Council) within which the Scheme lies.</p>
Road Drainage and the Water Environment	<p>Construction and Operation: As reported in Chapter 13 Road Drainage and the Water Environment (Section 13.6) of this ES (Application Document Reference: TR010031/APP/6.1), the ZOI is defined as 1km from the Extent of the Works as defined in Figure 13.1 of this ES (Application Document Reference: TR010031/APP/6.2) and Appendices 13.1-13.3 of this ES (Application Document Reference: TR010031/APP/6.3).</p>

15.7. BASELINE CONDITIONS

COMBINED EFFECTS

- 15.7.1. The baseline for the combined effects is described in the technical chapters (**Chapters 5-14**) in this ES (**Application Document Reference: TR010031/APP/6.1**).

CUMULATIVE EFFECTS

- 15.7.2. As part of Stage 2 in the cumulative effects assessment, a list of developments has been identified. This list has been updated as part of this ES and is outlined in **Table 15-8**.

15.8. ASSESSMENT OF COMBINED EFFECTS

- 15.8.1. A review of the technical assessments reported in **Chapters 5-14** of this ES (**Application Document Reference: TR010031/APP/6.1**) has been undertaken in order to identify new or different environmental effects, or those that could combine to result in an effect of greater significance. These combined effect interactions are detailed in **Table 15-7** below.

Table 15-7 - Matrix of combined effect interactions

Common Sensitive Receptors	Impacts	Air Quality	Cultural Heritage	Landscape and Visual	Biodiversity	Geology and Soils	Material Resources	Noise and Vibration	Population and Human Health	Road Drainage and Water	Combined Effect
Construction											
Residents	<ul style="list-style-type: none"> Changes to air quality within 200m of construction activities. Increased noise and vibration levels within 100m and 200m respectively of construction activities. Changes to views along the A1, temporary reduction in roadside vegetation screening and changes to views due to the proposed 3m high noise barrier at Birtley. Community severance and reduced access to public rights of way 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. 	✓		✓				✓	✓		Potential for temporary adverse/combined effects during construction. With the implementation of mitigation measures in the Construction Environmental Management Plan (CEMP) for the Scheme, the combined effect would be of minor significance (not significant).
Areas of amenity surrounding the Scheme	<ul style="list-style-type: none"> Changes to air quality within 200m of construction activities. Increased noise and vibration levels within 100m and 200m respectively of construction activities. Changes to views along the A1, temporary reduction in roadside vegetation screening and changes to views due to proposed 3m high noise barrier at Birtley. Impact to local users visiting Ancient Woodland and public open space associated with Ravensworth Castle. Reduced access to public rights of way during diversions. Impacts to human health e.g. inhalation of construction dust. Impacts on water quality due to construction activities. 	✓		✓				✓	✓	✓	Potential for both temporary adverse and permanent beneficial combined effects during construction (due to improvements in the outfalls associated with the Scheme once constructed). With the implementation of mitigation measures in the CEMP for the Scheme, the combined effect would be of minor significance (not significant).

Common Sensitive Receptors	Impacts	Air Quality	Cultural Heritage	Landscape and Visual	Biodiversity	Geology and Soils	Material Resources	Noise and Vibration	Population and Human Health	Road Drainage and Water	Combined Effect
	<ul style="list-style-type: none"> Improvements to the surface water discharge during construction due to implementation of the attenuation measures at the outfalls. 										
Road users	<ul style="list-style-type: none"> Changes to air quality within 200m of construction activities. Increased noise and vibration levels within 100m and 200m respectively of construction activities. Changes to views along the A1 including as a result of temporary reduction in roadside vegetation screening. Impacts to human health e.g. driver/user stress. 	✓		✓				✓	✓		Potential for temporary combined adverse effects during construction. With the implementation of mitigation measures in the CEMP for the Scheme, the combined effect would be of minor significance (not significant).
Users of footpaths (walking, cycling and horse riding)	<ul style="list-style-type: none"> Changes to air quality within 200m of construction activities. Increased noise and vibration levels within 100m and 200m of construction activities respectively. Visual e.g. changes to views along the A1, temporary reduction in roadside vegetation screening and changes to views due to the proposed 3m high noise barrier at Birtley. Impacts to human health e.g. inhalation of construction dust prior to implementation of mitigation measures set out in the Outline CEMP (Application Document Reference: TR010031/APP/7.4). 	✓		✓				✓	✓		Potential for temporary adverse combined effects during construction. With the implementation of mitigation measures in the CEMP for the Scheme, the combined effect would be of minor significance (not significant).
Statutory and non - statutory designated ecological sites/local biodiversity	<ul style="list-style-type: none"> Changes to air quality within 200m of construction activities. Increased noise and vibration levels within 100m and 200m of construction activities. Loss of trees and vegetation and impact on the connectivity of wildlife corridors. Beneficial impacts as a result of improvements to all outfalls (these include but are not limited to; Longacre Dene Local Wildlife Site and Norwood Local Nature 	✓		✓	✓			✓		✓	Potential for both temporary adverse and permanent beneficial combined effects during construction (due to improvements in the outfalls associated with the Scheme once constructed). With the implementation of mitigation measures in the CEMP for the Scheme, the combined effect would be of minor significance (not significant).

Common Sensitive Receptors	Impacts	Air Quality	Cultural Heritage	Landscape and Visual	Biodiversity	Geology and Soils	Material Resources	Noise and Vibration	Population and Human Health	Road Drainage and Water	Combined Effect
	Reserve).										
Operation											
Residents	<ul style="list-style-type: none"> – Exposure to increased pollution (NO₂ and PM₁₀) from changes to traffic flow, mix and speed. – Overall reduction in noise across the Scheme due to noise barrier and low noise surfacing. – Changes to views along the A1 from vegetation removal (in the medium term until vegetation is established). and the proposed 3m high noise barrier at Birtley. – Reduced traffic congestion along the carriageway is likely to improve safety, journey times and reduce driver stress. – Potential improvements in health by reduced noise levels and congestion along with improved community connectivity. 	✓		✓				✓	✓		Potential for both adverse and beneficial combined effects during operation. The overall combined effect would be minor beneficial (not significant).
Areas of amenity surrounding the Scheme.	<ul style="list-style-type: none"> – Overall reduction in noise levels. – Reduced traffic congestion along the carriageway is likely to improve safety, journey times, air quality and reduce noise and improve amenity (e.g. access to public rights of way, local sense of landscape character and reduce driver/user stress). – Impact to local users visiting Ancient Woodland and public open space. associated with Ravensworth Castle. – Potential improvements in health by reduced noise levels and congestion along with improved community connectivity. – Improvements to the surface water discharge during operation due to implementation of the attenuation measures at the outfalls. 	✓	✓	✓				✓	✓	✓	Potential for a combined adverse effect on amenity users and several combined beneficial effects. The overall combined effect would be minor beneficial (not significant).

Common Sensitive Receptors	Impacts	Air Quality	Cultural Heritage	Landscape and Visual	Biodiversity	Geology and Soils	Material Resources	Noise and Vibration	Population and Human Health	Road Drainage and Water	Combined Effect
Road users	<ul style="list-style-type: none"> – Exposure to increased pollution (NO₂ and PM₁₀) from changes to traffic flow, mix and speed. – Reduced traffic congestion along the carriageway is likely to improve safety, journey times and reduce noise levels, improving amenity and driver/user stress for route users. – Changes to views along the A1, including to the proposed 3m high noise barrier at Birtley. – Potential improvements in health by reduced noise levels and congestion along with improved community connectivity. 	✓		✓				✓	✓		Potential for both combined adverse effects during operation from impacts on air quality, traffic and changes to views. There is also potential for a combined beneficial effect on the health of road users from reduced noise and congestion. The overall combined effects would be minor beneficial and minor adverse (not significant).
Users of footpaths (walking, cycling and horse riding)	<ul style="list-style-type: none"> – Exposure to increased pollution (NO₂ and PM₁₀) from changes to traffic flow, mix and speed. – Reduced noise levels. – Changes to views along the A1, including to the proposed 3m high noise barrier at Birtley. – Improving amenity e.g. access to public rights of way and local sense of landscape character. – Potential improvements in health by reduced noise levels and congestion along with improved community connectivity. 	✓		✓				✓	✓		Potential for both combined adverse effects during operation from impacts on air quality, traffic and changes to views. There is also potential for a combined beneficial effect on users of footpaths from improvements in health from reduce noise and congestion. The overall combined effects would be minor beneficial and minor adverse (not significant).
Local biodiversity	<ul style="list-style-type: none"> – Reduced noise levels during construction will result in a beneficial impact on the local biodiversity. – Loss of trees and vegetation and impact on the connectivity of wildlife corridors (such as severance of commuting corridors for bats). – Impact to local users. – Improvements to water quality for local biodiversity. 			✓	✓			✓	✓	✓	Potential for combined adverse effects during operation. These effects would be temporary until such time where vegetation is established. The combined effect would be minor (not significant). There is also the potential for combined beneficial impacts during operation on water quality and noise levels. The combined effect would be minor beneficial (not significant).

15.9. ASSESSMENT OF CUMULATIVE EFFECTS

- 15.9.1. A total of 27 ‘other developments’ were included in the long list at Stage 1, see **Appendix 15.1** of this ES (**Application Document Reference: TR010031/APP/6.3**).
- 15.9.2. After refining the long list at Stage 2, 13 ‘other developments’ were included in the short list presented in **Table 15-8** and which have been included in the assessment of cumulative effects. The location of these ‘other developments’ is shown on **Figure 15.2 – Short List of Planning Applications** of this ES (**Application Document Reference: TR010031/APP/6.2**).

Table 15-8 - Short list of ‘other developments’

Short List ID	Planning Application Reference	Development Description
1	DC/16/01335/FUL	Erection of new commercial units within existing car park, new pedestrian walkways, landscaping and alterations to car park layout.
2	DC/15/01137/OUT	Erection of two B2/B8 use class units with associated car parking, landscaping and access.
3	DC/17/01054/FUL	Development of a 49.99 MW gas fired electricity generating facility, with associated infrastructure and landscaping.
4	DC/17/00170/FUL	352 dwellings including ecological habitat creation, new park and ride facility and associated open spaces, drainage and highways infrastructure and partial diversion of Public Right of Way (number WH66/2) through public open space and for up to 230 dwellings with associated landscaping, highways and drainage infrastructure.
5	DC/16/00867/FUL	Construction of a car park and formation of parking spaces, adjacent to the internal access road to create 100 additional car parking spaces.
6	DC/16/00924/FUL	Erection of 60 no. 2, 3 and 4 bedroom two-storey dwellings with associated works.
7	DC/17/01010/FUL	Erection of 36 dwellings and all associated services and infrastructure.
8	DC/16/01207/OUT	225 dwellings including associated infrastructure, open space and sustainable urban drainage systems and the demolition of farm buildings and commercial properties.
9	DC/17/00172/REM	52 dwelling houses, with associated car parking and

Short List ID	Planning Application Reference	Development Description
		landscaping.
10	DC/15/00817/REM	45 dwellings including 4 lifetime compliant dwellings and 1 wheelchair designed dwelling, alongside associated hard and soft landscaping works.
11	DC/17/00963/FUL	Demolition of the existing health club building and redevelopment to provide 22 apartments, associated car parking area and landscaping.
12	N/A	A1 Scotswood to North Brunton Improvement Scheme (SNB) to upgrade the A1 between junction 74 (Scotswood) and junction 79 (North Brunton), lanes to be widened in each direction. This scheme forms part of the Newcastle Gateshead Western Bypass (NGWB). This development was included within the traffic modelling for A1 B2CH (the Scheme).
13	N/A	A1 in Northumberland: Morpeth to Felton Scheme will upgrade the A1 to a dual carriageway between Morpeth to Felton. Other improvements on the scheme include three new junctions with bridges over the A1 and the provision of access tracks.

- 15.9.3. With regards to the ‘short listed’ developments detailed in **Table 15-8** many offered no or limited additional risk of cumulative effects as there was no overlap or limited spatial and temporal overlap of the environmental topic’s ZOI.
- 15.9.4. Both noise and air quality assessments utilised traffic model data within their assessment of operational effects (reported in **Section 5.10** of **Chapter 5 Air Quality** and **Section 11.10** of **Chapter 11 Noise and Vibration** of this ES (**Application Document Reference: TR010031/APP/6.1**)). As cumulative operational effects have already been considered and reported within these chapters, no further assessment has been provided within this cumulative assessment.
- 15.9.5. The full results of the assessment of cumulative effects is presented in **Appendix 15.3** of this ES (**Application Document Reference: TR010031/APP/6.3**). **Table 15-9** presents a summary of the likely significant cumulative effects during construction and operation.

Table 15-9 - Summary of likely significant cumulative effects during construction and operation

Planning Application ID (refer to Table 15-8)	Environmental Topics	Significance of Cumulative Effect
Construction		
1 and 2	<ul style="list-style-type: none"> – Biodiversity – Geology and Soils – Road Drainage and the Water Environment 	<p>The potential exists for an adverse cumulative effect during the construction phase. Cumulative effects relate to impacts to surface water receptors from site derived physical and chemical pollutants where works on concurrent development schemes are within 250m of each other.</p> <p>The application of good construction pollution prevention practices which will be detailed in the Contractor’s CEMP (and which will include those measures detailed in the Outline CEMP (Application Document Reference: TR010031/APP/7.4)) produced in support of this application, would result in these cumulative effects being of negligible significance (not significant).</p>
1-13	<ul style="list-style-type: none"> – Material Resources – Population and Human Health 	<p>Potential cumulative effects during the construction phase relate to the demand for materials (e.g. the demand for different types of key construction materials) and waste disposal (i.e. exceeding local land fill capacity). As a consequence, the potential exists for cumulative effects of minor adverse significance (not significant). The minor adverse effect could be reduced if site arisings from the Scheme could be used on the SNB scheme (ID 12) and/or A1 M2F scheme (ID 13).</p> <p>Due to the positive socio-economic effects associated with employment opportunities arising during construction of schemes (ID 1-13), potential cumulative effects of minor beneficial significance (not significant) are anticipated. These include both direct (i.e. employment within the construction industry), and indirect (i.e. employment across the wider supply chain and local spend of construction workers), effects.</p>
6	<ul style="list-style-type: none"> – Biodiversity 	<p>The effect of the loss of small losses of suitable, though sub-optimal, habitat for invertebrate Species of Principal Importance may be made more significant within the wider area by losses of suitable habitat by this development. The potential exists for cumulative effects of minor adverse significance. Measures to enhance habitat provision within both schemes would be likely to offset risks which would result in effects that are not significant.</p>
8	<ul style="list-style-type: none"> – Landscape and Visual 	<p>If the construction phase of this development (ID 8) coincides with the construction phase A1 B2CH (anticipated December 2020/21), there would be noticeable construction activity at two prominent locations within the Team Valley Character Area. If this were to occur, cumulative effects of minor adverse significance (not significant) would be anticipated.</p>
Operation		
8	<ul style="list-style-type: none"> – Landscape and Visual 	<p>A potential cumulative effect may occur in relation to the perception of landscape character. Views over Kibblesworth would include the housing development in the foreground, with no change to the view of the A1. The resulting effect on the landscape character would be negligible (not significant).</p>
1, 2 and 4	<ul style="list-style-type: none"> – Population and Human Health 	<p>Network capacity and connectivity improvements will support and facilitate economic growth and employment opportunities throughout the local area. This is anticipated to result in a cumulative effect of minor beneficial significance (not significant).</p>

15.10. MITIGATION AND MONITORING

- 15.10.1. No likely significant cumulative effects assessed are significant and therefore no mitigation or monitoring is required.

REFERENCES

Ref. 15.1 The Infrastructure Planning Regulations (Environmental Impact Assessment) Regulations 2017. Available at: <http://www.legislation.gov.uk/uksi/2017/572/contents/made> (accessed October 2018).

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 October 2018).

Ref. 15.3 WSP (2018). A1 Birtley to Coal House Scheme Traffic Model Uncertainty Log.

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 October 2018).

Ref. 15.5 Department for Transport (2018). TAG Unit M4 Forecasting and Uncertainty, Transport Analysis Guidance (TAG). [online] Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/712788/tag-unit-m4-forecasting-and-uncertainty-may-2018.pdf (accessed October 2018).

Ref. 15.6 Highways England (2008). Design Manual for Roads and Bridges Volume 11, Section 2, Part 5 Assessment and Management of Environmental Effects. HA205/08.

Ref. 15.7 Gateshead Council [online]. Available at: <https://www.gateshead.gov.uk/article/5318/View-or-comment-on-a-planning-application> (accessed October 2018).

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