

High Speed Rail (Crewe – Manchester)

Supplementary Environmental Statement 1 and Additional Provision 1 Environmental Statement

Volume 2: Community Area reports

MA01: Hough to Walley's Green

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MA01: Hough to Walley's Green



Department for Transport

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Structure of the HS2 Supplementary Environmental Statement 1 and Additional Provision 1 Environmental Statement

This report is part of the suite of documents that make up the SES1 and AP1 ES for High Speed Rail (Crewe – Manchester). The SES1 and the AP1 ES are separate documents, however, they are bound together and presented in a number of volumes shown in Figure 1 and described below:

- Non-technical summary (NTS). This provides a summary in non-technical language of the SES1 (Part 1) and the AP1 ES (Part 2). It presents a summary of any likely residual significant environmental effects (i.e. effects which are likely to remain after mitigation measures are put in place), both beneficial and adverse, which are new, different or have been removed compared to those reported in the ES submitted to Parliament in January 2022 in support of the hybrid Bill for the HS2 Phase 2b Western Leg ('the main ES');
- Glossary of terms, list of abbreviations and references. This contains any new or different terms and abbreviations used throughout the SES1 and the AP1 ES which are not already explained in the main ES and provides the references cited in each of the volumes listed below;
- Volume 1: Introduction to the SES1 and the AP1 ES. This introduces the supplementary environmental information and changes to the design and construction assumptions included within the SES1 and amendments within the AP1 ES. The report explains the environmental impact assessment (EIA) process which has been applied;
- Volume 2: Community Area reports and map books. These report the supplementary environmental information and changes to the design and construction assumptions included within the SES1 (Part 1), amendments within the AP1 ES (Part 2) and any new, different or removed likely significant environmental effects arising from these changes and amendments in the following community areas:
 - MA01: Hough to Walley's Green;
 - MA02: Wimboldsley to Lostock Gralam;
 - MA03: Pickmere to Agden and Hulseheath;
 - MA04: Broomedge to Glazebrook; and
 - MA05: Risley to Bamfurlong.

These effects are compared to those reported in the main ES (as amended by the SES1 for the AP1 amendments). The maps relevant to each community area are provided in separate Volume 2 map books and should be read in conjunction with the relevant Community Area report.

The Community Area reports for MA04: Broomedge to Glazebrook and MA05 Risley to Bamfurlong are combined into one report for Volume 2 of the SES1 and AP1 ES.

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Note that changes to the design and the construction assumptions and environmental baseline information for the remaining community areas (MA06: Hulseheath to Manchester Airport, MA07: Davenport Green to Ardwick, MA08: Manchester Piccadilly Station) will be reported in a separate, future SES2 and AP2 ES.

- Volume 3: Route-wide effects. This describes any new or different likely significant environmental effects arising at a route-wide level from the supplementary environmental information and changes to the design and construction assumptions included within the SES1 (Part 1) and the amendments within the AP1 ES (Part 2) compared to those reported in the main ES (as amended by the SES1 for the AP1 amendments); and
- Volume 5: Appendices and map books. These contain supporting environmental information and associated maps.

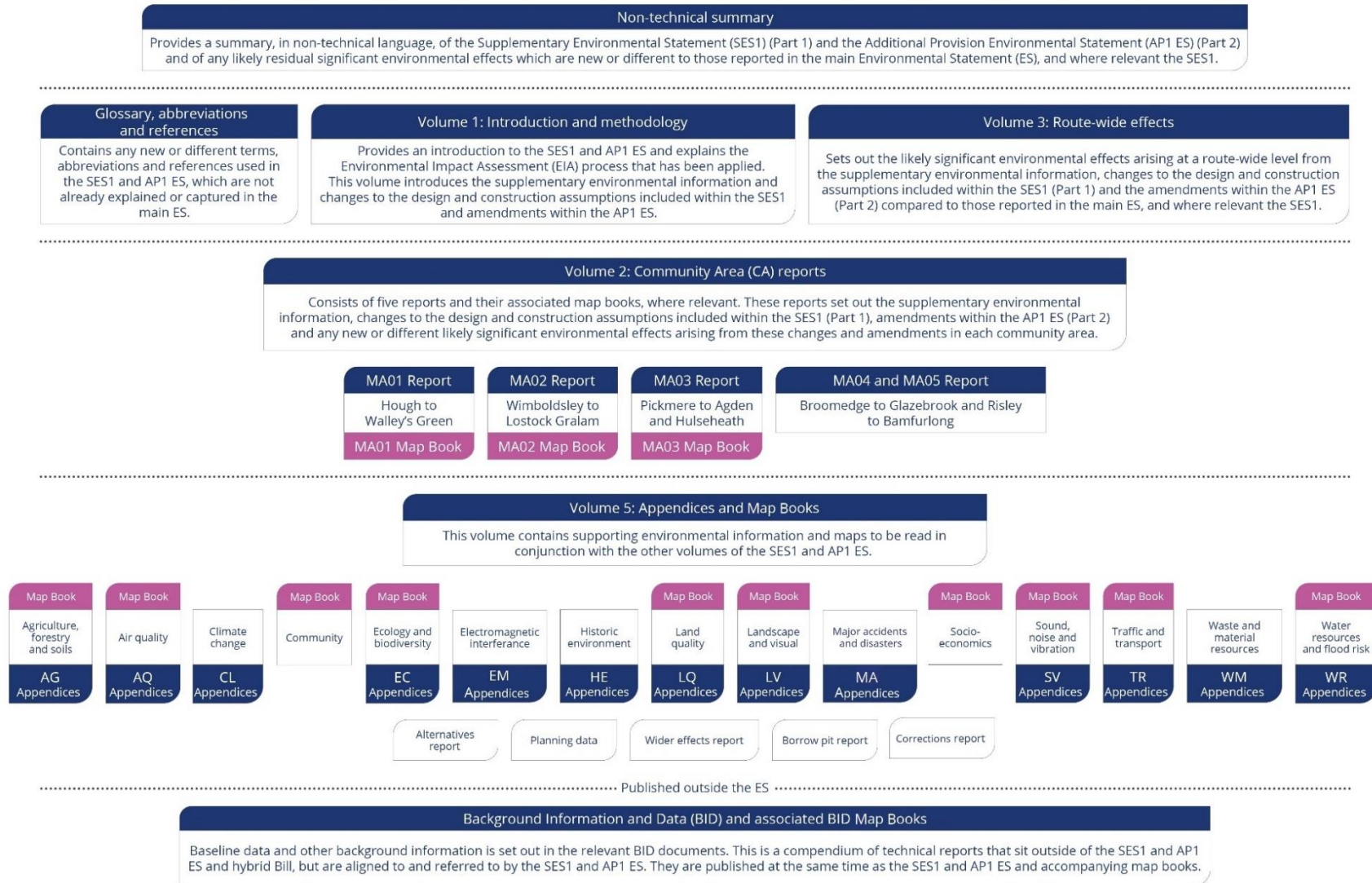
A Volume 4: Off-route effects report was produced as part of the main ES. An Off-route effects report has not been produced as part of this SES1 and AP1 ES. Any new or different off-route effects will be reported as part of SES2 and AP2 ES.

Certain reports and maps containing background information and data (BID) have been produced, which do not form part of the SES1 and AP1 ES. These documents are available online at <https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-supplementary-environmental-statement-1-and-additional-provision-1-environmental-statement>. The BID documents and maps present background survey information and other relevant background material.

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Figure 1: Structure of the SES1 and AP1 ES



Structure of this report

This volume of the SES1 and AP1 ES is divided into Community Area (CA) reports. Each of these reports is in turn divided into two parts.

Part 1 provides supplementary environmental information, where relevant, relating to:

- new baseline information with respect to environmental surveys completed and additional information received since the production of the main ES;
- changes to the design and construction assumptions that do not require changes to the Bill; and
- corrections to the main ES.

Part 2 provides environmental assessment information relating to proposed amendments to the design that have resulted in the need to alter the powers conferred by the Bill.

Parts 1 and 2 also include the following, where relevant:

- a description of the SES1 changes (Part 1) or the proposed AP1 amendments (Part 2) within the community area that have triggered the need for reassessment;
- an assessment of the environmental effects of the SES1 changes (Part 1) or the proposed AP1 amendments (Part 2) for relevant environmental topics, considering the:
 - scope, assumptions and limitations of the assessment;
 - environmental baseline;
 - effects arising during construction;
 - effects arising from operation; and
 - mitigation and residual effects.
- a summary of any new or different likely residual significant effects as a result of the SES1 changes (Part 1) and the proposed AP1 amendments (Part 2).

1 Introduction

- 1.1.1 The High Speed Rail (Crewe – Manchester) Bill was submitted to Parliament together with an Environmental Statement ('the main ES') in January 2022. Since submission of the Bill, a number of updates or changes to environmental baseline information, the design, and construction assumptions have occurred, which may lead to new or different significant effects. These effects, depending on the type of change, are reported in the SES1 or the AP1 ES, which form Part 1 and Part 2 of this document respectively.
- 1.1.2 The Bill and the Additional Provisions to the Bill described above, if enacted by Parliament, will provide the powers to construct, operate and maintain the HS2 Phase 2b Western Leg. Changes made through the SES1 and AP1 ES do not change the principles of the 'original scheme' (i.e. the Bill scheme which was assessed in the main ES) in terms of provision of a route between Crewe and Manchester and the essential components of the construction and operation of that scheme.
- 1.1.3 The SES1 contains updated environmental baseline information and scheme information relating to changes within the current limits and powers of the Bill, and therefore, which do not require an Additional Provision to the Bill. The SES1 changes within the Hough to Walley's Green area include:
- additional environmental baseline information (which may also be relevant to the SES1 scheme and/or AP1 revised scheme) for air quality; community; ecology and biodiversity; health; land quality; socio-economics; sound, noise and vibration; traffic and transport; and water resources and flood risk;
 - changes to the design and construction assumptions which do not require changes to the Bill; and
 - corrections to the main ES.
- 1.1.4 These changes are described in Part 1 and are assessed on a topic by topic basis where relevant using the same approach adopted in the main ES.
- 1.1.5 The purpose of the SES1 is to describe the assessment and identify any new or different likely significant environmental effects arising from the changes.
- 1.1.6 The AP1 ES describes the likely significant effects of amendments to the design of the scheme, which require the use of land outside the original limits of the Bill, additional access rights, or other extensions to the powers conferred by the Bill, making it necessary to submit an Additional Provision to the Bill.
- 1.1.7 The AP1 ES reports the assessment of each amendment separately for all relevant topics. The purpose of the AP1 ES is to provide an assessment of any new or different likely significant environmental effects arising from the amendments.
- 1.1.8 A combined assessment of new or different significant construction and operation traffic and traffic related effects, as a result of changes in traffic flows, is reported in Section 7. This is because alterations in traffic flows cannot generally be directly attributed to particular

SES1 changes or AP1 amendments. Traffic and transport effects are reported first, since the effects arise from changes in traffic flows. Other topics affected by traffic and transport changes are then reported as necessary.

- 1.1.9 All other new or different significant traffic and transport effects are reported with the relevant SES1 change or AP1 amendment section of this report.
- 1.1.10 The standard measures that will be used to mitigate likely significant adverse environmental effects during construction and operation of the scheme are described in Section 9 of Volume 1 of the main ES and in the draft Code of Construction Practice (CoCP)¹ submitted in support of the Bill. Implementation of these measures has been assumed in this SES1 and AP1 ES.
- 1.1.11 The following terms are used to differentiate between changes included in the SES1 and those included in the AP1 ES:
- 'SES1 design changes' – changes to the scheme design reported in the SES1 that do not require additional powers;
 - 'SES1 changes' – all changes reported in the SES1 that do not require additional powers. This may include new baseline information, changes to the design and construction assumptions, and corrections; and
 - 'AP1 amendments' – changes to the scheme reported in the AP1 ES that include requirements for additional powers in the Bill.
- 1.1.12 In addition, the following terms are used to differentiate between the original scheme described in the main ES and subsequent changes and amendments:
- 'the SES1 scheme' – the original scheme with any changes described in the SES1 that are within the existing powers of the Bill; and
 - 'the AP1 revised scheme' – the original scheme as amended by the SES1 changes and AP1 amendments.

¹ High Speed Two Ltd (2022), High Speed Rail (Crewe - Manchester), *Environmental Statement, draft Code of Construction Practice*, Volume 5, Appendix: CT-002-00000. Available online at: <https://www.gov.uk/government/collections/hs2-phase2b-crewe-manchester-environmental-statement>.

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2 Summary of changes in the Hough to Walley's Green area

2.1 New environmental baseline information

Air quality

- 2.1.1 Since the main ES, revised traffic data for the baseline year of 2018 and future baseline years for construction and operation has become available.

Community

- 2.1.2 Since the main ES, committed development MA01/454S, an outline application for 490 residential properties and a primary school, off David Whitby Way, Basford to the south of Crewe, has been included in the community future baseline. Implementation of MA01/454S could result in an increase of community resources within the community study area, altering the future baseline. For the SES1 scheme, the additional data does not result in any new or different significant effects compared to the main ES.

Ecology and biodiversity

- 2.1.3 Since the main ES, additional Phase 1 habitat, pond and canal, bat and great crested newt surveys have been completed in the Hough to Walley's Green area.
- 2.1.4 Details of additional ecological surveys completed in the Hough to Walley's Green area are provided in Background Information and Data (BID) documents² (BID EC-017-00000, BID EC-004-00000, BID EC-007-00000 and BID EC-011-00000), and BID Ecology Map Book³, Map

² High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), Background Information and Data accompanying Supplementary Environmental Statement 1 and Additional Provision 1 Environmental Statement, ecology and biodiversity baseline data. Available online at: <https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-supplementary-environmental-statement-1-and-additional-provision-1-environmental-statement>.

³ High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Background Information and Data accompanying Supplementary Environmental Statement 1 and Additional Provision 1 Environmental Statement, Ecology Map Book*. Available online at: <https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-supplementary-environmental-statement-1-and-additional-provision-1-environmental-statement>.

Series EC-02, EC-04, EC-05 EC-06, EC-08, EC-11, EC-12 and EC-16, which accompany the SES1 and AP1 ES.

- 2.1.5 New ecological baseline data relating to the designation of nature conservation sites have also been published by Cheshire Wildlife Trust for the Hough to Walley's Green area.
- 2.1.6 SES1 and AP1 ES Volume 5, Appendix: EC-001-00000 provides a summary of new ecological baseline data for designated sites. All new ecological survey data in this assessment is set out in the Background Information and Data (BID) documents. SES1 and AP1 ES Volume 5, Appendix: EC-015-00000 identifies additional local/parish level effects that are likely to occur as a consequence of SES1 changes and AP1 amendments.
- 2.1.7 Detail of supplementary ecological information that is relevant to the SES1 assessment is provided in Section 3.

Health

- 2.1.8 Since the main ES, committed development MA01/454S, an outline application for 490 residential properties and a primary school, off David Whitby Way, Basford to the south of Crewe, has been included in the health future baseline. Implementation of MA01/454S could result in an increase of resources within the health study area, altering the future baseline. For the SES1 scheme, the additional data does not result in any new or different significant effects compared to the main ES.

Land quality

- 2.1.9 Since the main ES, environmental regulatory data has been updated. This data includes information on pollution incidents, radioactive and hazardous substances consents, environmental permits (previously integrated pollution control and integrated pollution prevention and control licences) and ecological receptors.
- 2.1.10 In the Hough to Walley's Green area, this includes an additional pollution incident to controlled waters, a new discharge consent, two environmental permits associated with food manufacture and two additional petrol station sites.
- 2.1.11 Further details of these in relation to the SES1 scheme and AP1 revised scheme are presented in the BID⁴ report (BID LQ-002-00000 SES1 and AP1 ES), which accompanies the SES1 and AP1 ES.
- 2.1.12 For the SES1 scheme the additional data has resulted in no new or different significant effects compared to the main ES.

⁴ High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Supplementary Environmental Statement and Additional Provision Background Information and Data, Land quality baseline data, BID LQ-002-00000 SES1 and AP1 ES*. Available online at: <https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-supplementary-environmental-statement-1-and-additional-provision-1-environmental-statement>.

Socio-economics

- 2.1.13 Since the main ES, committed development MA01/454S, an outline application for a residential led mixed use scheme including a primary school, off David Whitby Way, Basford to the south of Crewe, has been included in the socio-economics future baseline. Implementation of MA01/454S could result in an increase of approximately 30 additional jobs associated with the new primary school, altering the future baseline. For the SES1 scheme, the additional data does not result in any new or different significant effects compared to the main ES.

Sound, noise and vibration

- 2.1.14 Road traffic information, such as flows and speeds, is used to determine the baseline sound levels. Since the main ES, additional road traffic information has been obtained for the SES1 scheme. Where relevant, this road traffic information has been used to update the existing and future baseline sound modelling. Details of the updated baseline information that is relevant to the assessment are provided in the SES1 and AP1 ES Volume 5, Appendix: SV-002-00000. This has been used in the sound, noise and vibration assessment undertaken for the SES1 changes and AP1 amendments, which are reported in Sections 3, 5 and 7 of this report.

Traffic and transport

- 2.1.15 Since the main ES, additional traffic information has been used in the development of updated baseline and future baseline models for the SES1 scheme and AP1 revised scheme. This includes new traffic data from National Highways, as set out in the BID report Transport Assessment policy and data (BID TR-004-00001 SES1 and AP1 ES)⁵ which accompany the SES1 and AP1 ES. These data have been combined with information collected for local junction modelling, as set out in the BID report Transport Assessment policy and data (BID TR-004-00001)⁶ which accompanied the main ES.
- 2.1.16 In addition, the baseline and future baseline models have been updated for the assessment of the SES1 scheme and AP1 revised scheme to reflect:
- refinement of network coding to improve model performance in key areas of interest and in response to stakeholder feedback;

⁵ High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Background Information and Data accompanying Supplementary Environmental Statement 1 and Additional Provision 1 Environmental Statement, Transport Assessment policy and data report, BID TR-004-00001 SES1 and AP1 ES*. Available online at: <https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-supplementary-environmental-statement-1-and-additional-provision-1-environmental-statement>.

⁶ High Speed Two Ltd (2022), High Speed Rail (Crewe - Manchester), *Background Information and Data, Transport Assessment policy and data report, BID TR-004-00001*. Available online at: <https://www.gov.uk/government/collections/hs2-phase-2b-crewe-manchester-environmental-statement>.

- inclusion of recently committed or completed transport schemes and development proposals that have come forward since the models used in the assessment reported in the main ES were developed;
- refinements to future baseline traffic demand to reflect changes to future growth patterns since the models used in the assessment reported in the main ES were developed and the release of updated road traffic forecasts by the Department for Transport (DfT);
- the change in the future baseline forecast year from 2046 to 2051 (as described in Volume 1 of the SES1 and AP1 ES); and
- updates to transport model parameters to reflect the latest release of the DfT's Transport Analysis Guidance (TAG) data book.

2.1.17 The assessment of the changes to traffic flows associated with the updated baseline and future baseline models in combination with all SES1 changes and AP1 amendments is reported in Section 7 of this report.

Water resources and flood risk

2.1.18 Since the main ES, the Environment Agency has issued updated datasets for groundwater source protection zones (SPZ), discharge consents and licensed water abstractions. However, these updated datasets do not introduce any new receptors or change existing receptors for water resources and flood risk topic in this area. For the SES1 scheme, the additional data do not result in any new or different significant effects compared to the main ES.

2.2 Changes to the construction assumptions not requiring a change to the Bill

Introduction

- 2.2.1 The need to make changes to the construction assumptions has been identified since the main ES. The changes in the Hough to Walley's Green area relate to the construction programme.
- 2.2.2 The changes, which are described below, do not require a change to the Bill.

Changes to construction assumptions

- 2.2.3 The main ES provided indicative details of the construction works to be managed from the construction compounds in the area – see Section 2 of Volume 2, Community Area report: Hough to Walley's Green (MA01) of the main ES. The information included the duration of works, number of workers and a summary of the works to be undertaken. A construction programme was also provided, which included indicative periods for each of the core construction activities.

- 2.2.4 A route-wide review of earthworks and the movement of materials has been undertaken since the main ES. Changes to assumed construction methods have also been made. The review and the changes have resulted in the need to alter the indicative construction programme. The revised programme is shown in Figure 3: Indicative construction programme and described in Section 3 of the SES1 and Section 5 of the AP1 ES.
- 2.2.5 There will be changes to the construction workforce at six compounds as a result of the AP1 revised scheme. An assessment of socio-economic effects on employment at a route-wide level is reported in Volume 3 of the SES1 and AP1 ES.
- 2.2.6 An indicative construction programme for the AP1 revised scheme is provided in Section 6 of this report.

SES1 engineering changes

- 2.2.7 There are no SES1 engineering or utility design changes which result in new or different significant effects in the Hough to Walley's Green area.

2.3 Corrections to the main ES

- 2.3.1 The need for a number of corrections to the contents of the main ES has been identified since submission of the Bill. Table 1 provides the following:
- corrections to the Volume 2, Community Area report: Hough to Walley's Green (MA01) that have the potential to alter the significant environmental effects reported in the main ES;
 - corrections to any factual inaccuracies relating to significant effects reported in the main ES;
 - clarifications to elements of the scheme description reported in the main ES.
 - the location of the text that is subject to the correction in the main ES;
 - the reason for the correction;
 - the original text from the main ES and, where applicable, revised text; and
 - whether the correction changes a significant effect reported in the main ES.
- 2.3.2 These corrections were considered, where relevant, in the technical assessments reported in Section 3 of this SES1.

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Table 1: Summary of corrections to the main ES Volume 2 Community Area report for the Hough to Walley's Green area

Reference in the main ES	Reason for correction	Text in the main ES	Revised text	Change to significant effects and mitigation
Ecology and biodiversity Paragraph 7.3.5, ninth bullet point, Volume 2, MA01 of the main ES	The area reported for the Local Wildlife Site (LWS) was incorrect in the main ES.	Paragraph 7.3.5, ninth bullet point 9: <ul style="list-style-type: none"> Shropshire Union Canal (Middlewich Branch) LWS, covering an area of 1.1ha, comprises a 7km stretch of canal, including a 570m section that passes through Polestead Wood. 	Paragraph 7.3.5, ninth bullet point 9: <ul style="list-style-type: none"> Shropshire Union Canal (Middlewich Branch) LWS, covering an area of 14.1ha, comprises a 7km stretch of canal, including a 570m section that passes through Polestead Wood. 	No change. The assessment was based on the correct areas and therefore this correction will not change the level of significance of the effect reported in the main ES.
Sound, noise and vibration, Table 46, Volume 2, MA01 of the main ES	A figure stated in the main ES is incorrect.	Paragraph 13.5.28, Table 46, first entry: Location and details - Approximately 265 dwellings ¹⁶⁷ in the vicinity of Earle Street, Brierley Street, Broughton Road, North Street, North Stafford Street, Thomas Street, Wallis Street, Henry Street, Middlewich Street, Ridgeway Street, Audley Street, Sheppard Close, Sherbourne Road, Broad Street Cranbourne Road, Greenacres, Crossway, Lime Street, Hazelmere Way, Basford Road, Broad Street, Hazel Grove, Churchmere Drive and Chapelmere Court. Forecast ground-borne noise and vibration from the railway is likely to cause an adverse effect on the acoustic character within the properties as a result of: <ul style="list-style-type: none"> low ground-borne noise impacts at approximately 30 properties; medium ground-borne noise and minor vibration impacts at approximately 200 properties; and 	Paragraph 13.5.28, Table 46, first entry: Location and details - Approximately 285 dwellings ¹⁶⁷ in the vicinity of Earle Street, Brierley Street, Broughton Road, North Street, North Stafford Street, Thomas Street, Wallis Street, Henry Street, Middlewich Street, Ridgeway Street, Audley Street, Sheppard Close, Sherbourne Road, Broad Street Cranbourne Road, Greenacres, Crossway, Lime Street, Hazelmere Way, Basford Road, Broad Street, Hazel Grove, Churchmere Drive and Chapelmere Court. Forecast ground-borne noise and vibration from the railway is likely to cause an adverse effect on the acoustic character within the properties as a result of: <ul style="list-style-type: none"> low ground-borne noise impacts at approximately 30 properties; medium ground-borne noise and minor vibration impacts at approximately 218 properties; and 	No change. This correction will not lead to a new or different significant effect.

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Reference in the main ES	Reason for correction	Text in the main ES	Revised text	Change to significant effects and mitigation
		<ul style="list-style-type: none"> high ground-borne noise and minor to moderate vibration impacts at approximately 35 properties. <p>Paragraph 13.5.44</p> <p>At the community level, the envisaged mitigation, including landscape earthworks and noise mitigation, described in this section, and presented in Map Series SV-05 (Volume 2: MA01 Map Book), will substantially reduce the potential airborne sound impacts and noise effects that would otherwise arise from the Proposed Scheme. Significant residual adverse effects are likely to remain due to increased ground-borne noise and vibration levels for occupants of approximately 265 residential properties in the vicinity of the following locations in Crewe (labelled MA01-O-C1 on Map SV-05-302): Earle Street, Brierley Street, Broughton Road, North Street, North Stafford Street, Thomas Street, Wallis Street, Henry Street, Middlewich Street, Ridgeway Street, Audley Street, Sheppard Close, Sherbourne Road, Broad Street Cranbourne Road, Greenacres, Crossway, Lime Street, Hazelmere Way, Basford Road, Broad Street, Hazel Grove, Churchmere Drive and Chapelmere Court.</p>	<ul style="list-style-type: none"> high ground-borne noise and minor to moderate vibration impacts at approximately 35 properties. <p>Paragraph 13.5.44</p> <p>At the community level, the envisaged mitigation, including landscape earthworks and noise mitigation, described in this section, and presented in Map Series SV-05 (Volume 2: MA01 Map Book), will substantially reduce the potential airborne sound impacts and noise effects that would otherwise arise from the Proposed Scheme. Significant residual adverse effects are likely to remain due to increased ground-borne noise and vibration levels for occupants of approximately 285 residential properties in the vicinity of the following locations in Crewe (labelled MA01-O-C1 on Map SV-05-302): Earle Street, Brierley Street, Broughton Road, North Street, North Stafford Street, Thomas Street, Wallis Street, Henry Street, Middlewich Street, Ridgeway Street, Audley Street, Sheppard Close, Sherbourne Road, Broad Street Cranbourne Road, Greenacres, Crossway, Lime Street, Hazelmere Way, Basford Road, Broad Street, Hazel Grove, Churchmere Drive and Chapelmere Court.</p>	
Traffic and transport Paragraph 14.4.30, Volume 2, MA01 of the main ES	The number of existing HGV parking spaces at Crewe Truck Stop and Café was incorrectly reported in the main ES.	<p>Paragraph 14.4.30, second bullet:</p> <ul style="list-style-type: none"> Crewe Truck Stop and Café - major adverse effect as a result of the temporary loss of 90 out of 124 spaces for a period of five years and three months due to the construction of the Proposed Scheme. 	<p>Paragraph 14.4.30, second bullet:</p> <ul style="list-style-type: none"> Crewe Truck Stop and Café - major adverse effect as a result of the temporary loss of 90 out of 120 existing HGV parking spaces for a period of five years and three months due to the construction of the Proposed Scheme. 	<p>No change.</p> <p>This correction will not lead to a new or different significant effect.</p>

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Reference in the main ES	Reason for correction	Text in the main ES	Revised text	Change to significant effects and mitigation
Traffic and transport Paragraph 14.5.13, Volume 2, MA01 of the main ES		Paragraph 14.5.13: There will be a permanent loss of approximately 59 out of 124 existing HGV parking spaces at the Crewe Truck Stop and Café. This will result in a major adverse effect, which is significant.	Paragraph 14.5.13: There will be a permanent loss of approximately 59 out of 120 existing HGV parking spaces at the Crewe Truck Stop and Café. This will result in a major adverse effect, which is significant.	
Traffic and transport Paragraph 14.4.23, Volume 2, MA01 of the main ES	The need for temporary traffic management on the A532 Weston Road during utility works should have been reported in the main ES.	None included.	Paragraph 14.4.23 insert new bullet (1st bullet): <ul style="list-style-type: none"> A532 Weston Road – temporary traffic management including signal control on the A532 Weston Road during utility works for a period of 32 weeks. The A532 Weston Road will operate a one-way system, with the adjacent Weston Road Service Road used for the alternate direction, resulting in a negligible change in journey length. 	The assessment of the changes to traffic flows as a result of this correct is included in the assessment of the AP1 revised scheme reported in Section 7.
Traffic and Transport, Paragraph 14.4.26, Volume 2, MA01 of the main ES	The main ES reports an incorrect effect on congestion and delay for vehicle occupants at the A532 Earle Street/A532 Manchester Bridge/William Street/Grand Junction Way junction during construction. The correct effect is moderate adverse.	Paragraph 14.4.26, ninth bullet: <ul style="list-style-type: none"> A532 Earle Street/A532 Manchester Bridge/William Street/Grand Junction Way (A532 Earle Street Roundabout) - major adverse effect during scenario 2; 	Paragraph 14.4.26, ninth bullet: <ul style="list-style-type: none"> A532 Earle Street/A532 Manchester Bridge/William Street/Grand Junction Way (A532 Earle Street Roundabout) - moderate adverse effect during scenario 2; 	Yes. The effect changes from major adverse to moderate adverse.

3 Assessment of changes in the Hough to Walley's Green area

3.1 Introduction

3.1.1 This section describes the effects of the SES1 changes due to new environmental baseline information in the Hough to Walley's Green area on:

- ecology and biodiversity; and
- sound, noise and vibration.

3.1.2 Any new or different likely significant environmental effects as a result of the changes summarised in Section 2 are identified, compared to the original scheme.

3.2 Ecology and biodiversity

Introduction

3.2.1 The environmental baseline relevant to the ecology and biodiversity assessment is described below. Any new or different likely significant environmental effects as a result of the SES1 changes introduced in Section 2 are then identified, compared to those reported in the main ES.

Scope, assumptions and limitations

3.2.2 The assessment scope, key assumptions and limitations for ecology and biodiversity are as set out in Volume 1 and the EIA Scope and Methodology Report (SMR)⁷ of the main ES.

3.2.3 The SES1 changes of relevance to this assessment have the potential to result in new or different significant permanent construction effects only. Therefore, there is no operational assessment for ecology and biodiversity.

⁷ High Speed Two Ltd (2022), High Speed Rail (Crewe – Manchester), *Environmental Statement, Environmental Impact Assessment Scope and Methodology Report*, Volume 5, Appendix: CT-001-00001. Available online at:

<https://www.gov.uk/government/publications/hs2-phase-2b-environmental-impact-assessment-scope-and-methodology-report>.

SES1 changes relevant to the assessment

- 3.2.4 New environmental baseline information resulting from additional ecological surveys in the Hough to Walley's Green area is relevant to the assessment.

Environmental baseline

Existing baseline

- 3.2.5 The baseline ecology and biodiversity information is as described in Section 7 of Volume 2, Community Area report: Hough to Walley's Green (MA01) of the main ES. A summary of the baseline information relevant to the assessment of the SES1 changes is provided below.

Designated sites

- 3.2.6 Since the submission of the main ES, Cheshire Wildlife Trust has revised the boundary of Shropshire Union Canal (Middlewich Branch) LWS, which has reduced in extent from 14.1ha to 1.1ha and was located 43m west of the land identified for the purpose of habitat creation. The LWS now comprises a 570m stretch of the canal within Polestead Wood, west of Walley's Green, wholly within the Hough to Walley's Green area and is no longer within land required for the original scheme as amended by the SES1 scheme in the Wimboldsley to Lockstock Gralam area (MA02). The LWS is located 469m west of land that has been identified for the purpose of habitat creation or enhancement as amended by the SES1 scheme.
- 3.2.7 Information received from Cheshire Wildlife Trust also detailed the presence of one newly designated LWS, not reported in the main ES, which is of county/metropolitan value. Heath Farm Marshy Grassland LWS, covering an area of 1.7ha, comprises areas of semi-improved neutral grassland, marshy grassland and a number of ponds and is located 229m south of the land required for construction of the original scheme as amended by the SES1 scheme.

Habitats

- 3.2.8 There are no changes to the baseline habitats reported in the main ES as a result of additional surveys or changes to the original scheme, as amended by the SES1 scheme.

Species

Amphibians

- 3.2.9 The outcomes of additional ecological surveys undertaken for great crested newt have formed the basis of a review of the composition of meta-populations across the Hough to Walley's Green area. This review has considered the quality and connectivity of terrestrial habitat between ponds in order to determine the locations of distinct clusters of ponds that are likely to support meta-populations of great crested newt. This review has resulted in changes to the composition of four meta-populations, in comparison with those reported in the main ES. Each meta-population reported included one or more ponds where the

presence of great crested newt had been confirmed by survey, or where on a precautionary basis great crested newt populations are assumed to be present.

- 3.2.10 The main ES reported a great crested newt meta-population (GCNMP) in a network of 71 ponds located south-east of Hough (GCNMP 1.1.1), which included ponds in which presence of great crested newt was confirmed through desk study data. This meta-population is valued at up to county/metropolitan level in the main ES. Additional surveys have confirmed that great crested newt are absent from within one of the ponds within which they had assumed to be present as part of this meta-population. This pond therefore no longer forms part of GCNMP1.1.1. The revised meta-population, therefore, includes 70 ponds with confirmed or assumed populations of great crested newt, with the largest population assumed as being of medium size class. The decrease in the number of ponds with confirmed or assumed populations of great crested newt does not change the value of GCNMP 1.1.1 reported in the main ES.
- 3.2.11 The main ES reported a great crested newt meta-population (GCNMP1.1.18) in nine ponds to the north of Crewe, which included ponds in which the presence of great crested newts was confirmed through desk study and field survey data. On a precautionary basis, a medium sized population was assumed present, as the remaining ponds had not been surveyed. This meta-population is valued at up to county/metropolitan level in the main ES. Additional surveys have confirmed the previously assumed presence of great crested newts in one pond. There is no change in the total number of ponds and the meta-population is assumed to be of medium size class. There is no change in the value of this meta-population as reported in the main ES.
- 3.2.12 The main ES reported a great crested newt meta-population in 130 ponds to the north of Crewe and south-east of Middlewich (GCNMP1.1.19). This included ponds in which the presence of great crested newt was confirmed through desk study and field survey data. On a precautionary basis, the presence of a large sized population was assumed as it is associated with a network of over 100 ponds. This meta-population is valued at up to county/metropolitan level in the main ES. Additional surveys have confirmed:
- absence of great crested newt within four ponds where great crested newt populations were previously assumed to be present. These no longer form part of the meta-population; and
 - presence of great crested newt within three ponds where great crested newt populations were previously assumed to be present. These ponds still form part of the meta-population.
- 3.2.13 In addition to the confirmed great crested newt populations within GCNMP 1.1.19, as reported in the main ES, there are a further 76 ponds with assumed populations that are considered to form part of this meta-population. A further pond that forms part of this meta-population has been identified following a review of mapping. The revised meta-population therefore includes 127 ponds with confirmed or assumed populations of great crested newt. The decrease in the number of ponds with confirmed or assumed populations

of great crested newt does not change the value of GCNMP 1.1.19, as reported in the main ES.

- 3.2.14 The main ES reported a great crested newt meta-population in 56 ponds in the area to the north of Crewe extending to Walley's Green (GCNMP1.1.20) which includes ponds in which the presence of great crested newt was confirmed by field survey data. On a precautionary basis, the presence of a medium population was assumed in the remaining un-surveyed ponds. This meta-population is valued at up to county/metropolitan value in the main ES. Additional surveys have confirmed the previously assumed presence of great crested newt within one pond. There is no change in the total number of ponds in the meta-population, with the population still assumed, on a precautionary basis, to be of medium size class. There is no change to the value of this meta-population as reported in the main ES.
- 3.2.15 The main ES reported the loss of five ponds within the Hough to Walley's Green area, which had not been subject to survey and were assumed to support populations of great crested newt of up to county /metropolitan importance. Additional surveys have confirmed that great crested newt are absent from two of these ponds. The number of assumed great crested newt ponds to be lost across the Hough to Walley's Green area as a result of the construction of the original scheme is reduced from five ponds, as reported in the main ES, to three.

Bats

- 3.2.16 The main ES reported an assemblage of at least eight species of bats between Coppenhall Moss and Walley's Green. Occasional roosts of at least five bat species, and a feeding perch of an unidentified species, were recorded. This assemblage is considered to be of county/metropolitan value on the basis of the moderate numbers of foraging and commuting *Myotis* species and low to moderate numbers of noctule recorded. These species are considered 'rarer' bats in England⁸ although noctule are considered more common in Cheshire. Additional surveys recorded a possible maternity roost of common pipistrelle, located 20m west of land required for the construction of the original scheme, as amended by the SES1 scheme, and two further common pipistrelle occasional roosts, located 15m and 25m south-west of land required for the construction of the original scheme as amended by the SES1 scheme. The recording of these additional roosts does not change the value of the bat assemblage, reported in the main ES.

Future baseline

- 3.2.17 The Planning data report of the main ES (see Volume 5, Appendix: CT-004-00000 of the main ES) provides details of committed developments assumed to have been implemented by 2025. This information has been supplemented by the committed developments listed in the equivalent Volume 5 Planning data report of the SES1 and AP1 ES (see SES1 and AP1 ES Volume 5, Appendix: CT-004-00000). These committed developments have been considered

⁸Wray, S. Wells, D. Long, E. & Mitchell-Jones, T. (2010), *Valuing Bats in Ecological Impact Assessment*, In-Practice, 23-25. Chartered Institute of Ecology and Environmental Management, Winchester.

within a future baseline where relevant, and their potential to give rise to cumulative effects has been assessed.

- 3.2.18 None of the identified developments affect the assessment of the original scheme, as amended by the SES1 scheme's likely construction and operation impacts on ecology and biodiversity.

Effects arising during construction

Avoidance and mitigation measures

- 3.2.19 No avoidance or mitigation measures additional to those reported in the main ES and draft Code of Construction Practice (CoCP)¹, are required.

Assessment of impacts and effects

Species

Amphibians

- 3.2.20 The main ES reported that the loss of habitat resulting from the construction of the original scheme would result in an adverse effect on the meta-population of great crested newt in a network of 71 ponds to the south-east of Hough (GCNMP1.1.1). This would result in a permanent adverse effect on the meta-population that is significant at the county/metropolitan level. Additional surveys confirmed that great crested newt are absent from one of these ponds. Consequently, the number of ponds associated within this meta-population is reduced to 70. The change in the composition of this meta-population will result in a different significant effect to that reported in the main ES. However, this will not change the level of significance of the effect on this meta-population as reported in the main ES.
- 3.2.21 The main ES reported that the loss of habitat resulting from the construction of the original scheme would result in an adverse effect on the meta-population of great crested newt in a network of 130 ponds to the north of Crewe and the south-east of Middlewich (GCNMP1.1.19). This would result in a permanent adverse effect on the meta-population that is significant at the county/metropolitan level. Following additional surveys, the number of ponds associated within this meta-population has been reduced to 127. The change in the composition of this meta-population will result in a different significant effect to that reported in the main ES. However, this will not change the level of significance of the effect on this meta-population as reported in the main ES.
- 3.2.22 The main ES reported the loss of five ponds within the Hough to Walley's Green area, which had not been subject to survey and were assumed to support populations of great crested newt of up to county/metropolitan importance. Additional surveys have confirmed that great crested newt are absent from two of these ponds. The number of assumed great crested newt ponds to be lost across the Hough to Walley's Green area as a result of the

construction of the original scheme as amended by the SES1 scheme is reduced from five ponds, as reported in the main ES, to three ponds. The ponds are assumed to support populations of great crested newts and the loss of the water bodies supporting these populations could result in a permanent adverse effect on amphibian populations that will be, in each case, significant at up to county/metropolitan level. This will result in a different significant effect to that reported in the main ES, however, this will not change the level of significance of the effect reported in the main ES.

Bats

- 3.2.23 The main ES reported a bat assemblage of at least eight species between Coppenhall Moss and Walley's Green. Although no roosts were recorded within the land required for the construction of the original scheme, it was assumed on a precautionary basis that roosts would be lost due to the loss of woodland and foraging habitat. It was also assumed on a precautionary basis that occasional roosts of common pipistrelle and brown long-eared bat would be lost as they are located immediately adjacent to the land required for the construction of the original scheme. The loss and disturbance of these roosts and partial loss of woodland foraging and commuting habitats would result in a permanent adverse effect to the bat assemblage which is significant at the county/metropolitan level. Additional surveys recorded a possible maternity roost of common pipistrelle located 20m west of land required for construction of the original scheme as amended by the SES1 scheme, and two further common pipistrelle occasional roosts, located 15m and 25m south-west of land required for the construction of the original scheme as amended by the SES1 scheme. The loss and disturbance of these additional roosts will result in an additional impact on the bat assemblage. This will result in a different significant effect to that reported in the main ES; however, this will not change the level of significance of the effect reported in the main ES.

Other mitigation measures

Species

Amphibians

- 3.2.24 The main ES reported that significant adverse effects on the great crested newt populations within the Hough to Walley's Green area would be addressed by creating areas of suitable habitats. The habitats would be created north of Parkers Road, east of Moss Lane, west of Warmingham Road, south of Larch Wood and west of Park House Farm. These measures would comprise provision of ponds, grassland and woodland that would be designed to compensate for the loss of breeding sites, foraging habitat and places of shelter used by great crested newt and other amphibian species. Following implementation, the adverse effects on the amphibian populations in the Hough to Walley's Green area would be reduced to a level that is not significant. The assessment undertaken, following the consideration of additional baseline information, has concluded that the original scheme as amended by the SES1 scheme will result in a different effect but will not change the level of significance reported in the main ES. The provision of compensatory habitats, as reported in the main ES

will, once established, reduce adverse effects on amphibian populations to a level that is not significant.

Bats

- 3.2.25 The main ES reported that significant effects to the bat assemblage between Coppenhall Moss and Walley's Green would be addressed by mitigation which would be provided in accordance with the Ecological Principles of Mitigation within the SMR. This includes the provision of artificial roosts, as well as woodland planting and creation of hedgerows, grassland, wetland habitat and ponds throughout this area. As described in the main ES, the disturbance and potential loss of bat roosts from woodland as well as the disturbance of occasional roosts of common pipistrelle and brown long-eared bat will be addressed through the provision of suitable replacement roosts within nearby retained woodland as described in the main ES. Measures will address the impact on the assemblage from the loss of roosting, foraging and commuting habitat. They will also compensate for the losses of foraging and commuting habitat likely to be used by bats from those additional roosts identified through additional surveys. The loss of the additional possible maternity roost of common pipistrelle located 20m west of land required for construction of the original scheme as amended by the SES1 scheme, and two further common pipistrelle occasional roosts, located 15m and 25m south-west of land required for the construction of the of the original scheme as amended by the SES1 scheme, will be addressed through the provision of suitable replacement roosts within nearby retained habitat as described in the main ES. Following implementation of these measures, the effects on the bat assemblage between Hough to Walley's Green area will be reduced to a level that is not significant.

Summary of likely residual significant effects

- 3.2.26 Although there are different effects on great crested newt and bats there are no changes to the likely residual significant construction ecology and biodiversity effects identified in the main ES as a result of the SES1 changes.

Cumulative effects

- 3.2.27 No new, removed or different significant cumulative effects have been identified compared to the main ES.

3.3 Sound, noise and vibration

Introduction

- 3.3.1 The environmental baseline relevant to the sound, noise and vibration assessment is described below. Any new or different likely significant environmental effects as a result of the changes introduced in Section 2 are then identified, compared to those reported in the main ES.

3.3.2 Sound, noise and vibration effects that result from the assessment of the changes to traffic flows as a result of all AP1 amendments in combination with all SES1 changes are reported in Section 7.

Scope, assumptions and limitations

3.3.3 The assessment scope, key assumptions and limitations for sound, noise and vibration are as set out in Volume 1 and the SMR of the main ES.

3.3.4 The SES1 changes have the potential to result in new or different likely significant construction effects only. Therefore, there is no operational assessment for sound, noise and vibration.

SES1 changes relevant to the assessment

3.3.5 The following SES1 changes are considered in the construction phase assessment:

- additional environmental baseline information; and
- changes to the construction design programme.

Environmental baseline

Existing baseline

3.3.6 In the Hough to Walley's Green area, the updated sound modelling described in Section 2 has resulted in updates to the existing baseline sound levels at receptors adjacent to Broughton Road and in the community of Coppenhall. Further information on the updated baseline sound levels relevant to the assessment is provided in the SES1 and AP1 ES Volume 5, Appendix: SV-002-00000. Where no updates to baseline sound levels are required, the baseline sound, noise and vibration information is as described in Section 13 of Volume 2, Community Area report: Hough to Walley's Green area (MA01) of the main ES.

Future baseline

3.3.7 The Planning data report of the main ES (see Volume 5, Appendix: CT-004-00000 of the main ES) provides details of committed developments assumed to have been implemented by 2025. This information has been supplemented by the committed developments listed in the equivalent Volume 5 Planning data report of the SES1 and AP1 ES (see SES1 and AP1 ES Volume 5, Appendix: CT-004-00000). These committed developments have been considered as a future baseline where relevant.

3.3.8 The developments have been considered to determine whether they would result in a material change to the future baseline or have the potential to give rise to cumulative effects. None of the identified developments affect the assessment of sound, noise and vibration for the SES1 scheme.

- 3.3.9 Updates have also been made to future baseline sound levels at the locations identified in the existing baseline section above, where updates to the existing baseline sound levels have been made for the SES1 and AP1 ES.

Effects arising during construction

Avoidance and mitigation measures

- 3.3.10 No avoidance or mitigation measures, additional to those reported in the main ES and draft CoCP, are required.

Assessment of impacts and effects

- 3.3.11 The SES1 scheme has the potential to give rise to new and different temporary adverse noise effects which may be considered to be significant on a community basis. The duration of impact is the period where the relevant assessment category is exceeded. The predicted monthly construction noise level will vary throughout this period and as a guide the typical and highest monthly noise levels at the closest dwellings in the community identified are presented in the 'cause' column of the following table. The potential new or different likely significant effects are discussed in the following paragraphs and summarised in Table 2.
- 3.3.12 The main ES identified a significant adverse construction noise effect in the vicinity of approximately 250 dwellings at Coppenhall for a duration of up to five years and six months during the daytime; up to two years and four months during the evening; and up to two years and six months during the night-time. In addition to the noise impact, a vibration impact of up to six months during the daytime was also identified. This was denoted as MA01-C-C2 in Table 13.2 of the Volume 2, Community Area report: Hough to Walley's Green (MA01), in Volume 5, Appendix: SV-002-0MA01 and in the Volume 5, Sound, noise and vibration Map Book, Map Series SV-03 of the main ES. The SES1 changes to existing baseline sound levels will decrease the number of dwellings affected by noise at this community by approximately 20, which will give rise to a different likely significant effect on the residential community. The vibration impact will remain as reported in the main ES.

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Table 2: Direct adverse construction effects on residential communities and shared open areas that are considered to be significant on a community basis and are new or different to those reported in the main ES

Significant effect number (and map reference) ⁹	Type of significant effect	Time of day	Location	Cause (construction activities) ¹⁰	Assumed approximate duration of impact
MA01-C-C2 (SV-03-302 SV-03-303)	Construction noise and vibration and traffic noise (Different)	Daytime, evening and night-time	Coppenhall: approximately 230 ¹¹ dwellings in the vicinity of Broughton Road.	<p>During the daytime, general site works, earthworks and bored tunnel works in the vicinity of Crewe tunnel north portal. The typical and highest monthly noise levels will be approximately 55dB to 70dB and 60dB to 80dB¹².</p> <p>During the evening and night-time, general site works and bored tunnel works in the vicinity of Crewe tunnel north portal. The typical and highest monthly noise levels will be approximately 45dB to 60dB and 50dB to 65dB¹³.</p> <p>Vibratory rollers associated with site setup are predicted to cause a moderate vibration impact at dwellings near to the boundary of the Crewe tunnel north main compound¹⁴.</p>	<p>Noise for up to five years and six months during the daytime; up to two years and four months during the evening; and up to two years and six months during the night-time.</p> <p>Vibration for up to six months during the daytime.</p>

⁹ See SES1 and AP1 Volume 5, Appendix: SV-002-00000 and the Volume 5, Sound, noise and vibration Map Book, Map Series SV-003.

¹⁰ The construction activity giving rise to the highest predicted noise or vibration level is reported. Multiple construction activities may contribute to the typical noise levels and the approximate duration of impact.

¹¹ Approximately 15 properties are predicted to experience a combined impact from off-site construction traffic activities.

¹² Equivalent continuous sound level at the facade, $L_{pAeq, 0700-1900}$.

¹³ Equivalent continuous sound level at the facade, $L_{pAeq, 1900-2300}$ and $L_{pAeq, 2300-0700}$ respectively.

¹⁴ Not all dwellings impacted by vibration. See SES1 and AP1 Volume 5, Appendix: SV-002-00000 Sound, noise and vibration report for further details.

- 3.3.13 For further information see SES1 and AP1 ES Volume 5, Appendix: SV-002-00000 and SES1 and AP1 ES Volume 5, Sound, noise and vibration Map Book.

Other mitigation measures

- 3.3.14 No mitigation measures additional to those reported in the main ES and draft CoCP are required.

Cumulative effects

- 3.3.15 No new, removed or different significant cumulative effects have been identified compared to the main ES.

Summary of likely residual significant effects

- 3.3.16 The SES1 changes to the existing baseline sound levels will give rise to a different likely temporary residual adverse significant construction noise effect on the residential community of Coppenhall, in the vicinity of Broughton Road, due to a decrease in the number of dwellings affected.

3.4 Summary of new or different likely residual significant effects as a result of the SES1 changes

- 3.4.1 The SES1 changes to the existing baseline sound levels will give rise to a different likely temporary residual adverse significant construction noise effect on the residential community of Coppenhall, in the vicinity of Broughton Road, due to a decrease in the number of dwellings affected.

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4 Summary of AP1 amendments in the Hough to Walley's Green area

4.1 Introduction

4.1.1 The need to make changes to the design and to construction assumptions has been identified since the main ES. The changes in the Hough to Walley's Green area relate to engineering amendments and are described below.

4.1.2 Please note that all dimensions in the following sections are approximate.

4.2 Engineering amendments

4.2.1 Engineering amendments will be required in the Hough to Walley's Green area that will result in changes to the land or Bill powers required for the original scheme. Table 3 provides a summary of the engineering amendments. Figure 2 shows the locations of the engineering amendments.

Table 3: Summary of engineering and utility amendments in the Hough to Walley's Green area

Name of amendment	Description of the original scheme	Description of the AP1 revised scheme
Additional land permanently required for the realignment and extension of Crewe tunnel AP1-001-001 Map CT-06-301 to CT-06-306, in the SES1 and AP1 ES Volume 2, MA01 Map Book	Crewe tunnel, a twin bored tunnel 6.2km in length and up to 43m in depth, would be provided, passing under Crewe.	Crewe tunnel will be extended at the northern portal by approximately 620m, emerging 60m to the north of the existing Parkers Road. Crewe tunnel will have a lower vertical alignment between Middlewich Street ventilation shaft and Crewe tunnel north portal.
Additional land permanently required for the provision of a power supply to Crewe tunnel AP1-001-002 Map CT-06-305 to CT-06-305-L3, in the SES1 and AP1 ES Volume 2, MA01 Map Book	A new electricity supply, two 33kv Scottish Power underground cables, for 4.3km in length, would be installed from the existing Scottish Power primary substation in south-west Crewe to Crewe tunnel north portal, located within the public highway on Middlewich Road, Pyms Lane, Badger Avenue, Underwood Lane, Bradfield Road, and Broughton Road.	The electricity supply will be installed within the public highway on Halton Drive, Sunnybank Road, West Street, Bowen Cooke Avenue, Badger Avenue, Underwood Lane, Bradfield Road, and Broughton Road.

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Name of amendment	Description of the original scheme	Description of the AP1 revised scheme
<p>Change to Bill powers required for the diversion of Footpath Crewe 12/1</p> <p>AP1-001-003</p> <p>Map CT-06-306, C6 to D4, in the SES1 and AP1 ES Volume 2, MA01 Map Book</p>	<p>A section of Footpath Crewe 12/1 would be diverted up to 2km west and north of its current alignment. The footpath would connect with Footpath Crewe 29/1 and Footpath Leighton 7/1 on the western side of the West Coast Main Line (WCML).</p>	<p>The diversion of Footpath Crewe 12/1 will be extended by 275m, alongside the southern edge of the Footpath Crewe 29/1 overbridge approach ramp, to join the diverted Footpath Crewe 12/1 to Footpath Crewe 12/2.</p>
<p>Additional land temporarily required for modifications to Warmingham Road and Groby Road junction</p> <p>AP1-001-004</p> <p>Map CT-05-306-R1, B6 to C4, in the SES1 and AP1 ES Volume 2, MA01 Map Book</p>	<p>The Bill provides for temporary junction improvements at the junction of Warmingham Road and Groby Road to allow construction traffic movements.</p>	<p>The junction of Warmingham Road and Groby Road will be temporarily modified to a greater extent than shown in the main ES. The junction will be modified to include carriageway widening to enable the formation of a right-turn lane to the south of the junction on Warmingham Road and a left turn lane to the north of the junction on Warmingham Road. These junction alterations will enable safer turning manoeuvres and manage potential traffic conflicts.</p>
<p>Change to Bill powers required for the relocation of an access point and realignment of Hoggins Brook at Moss Lane</p> <p>AP1-001-005</p> <p>Map CT-06-306, B7 to F6, in the SES1 and AP1 ES Volume 2, MA01 Map Book</p>	<p>The Bill provides for a HS2 attenuation pond and a trackside laydown area, located at Moss Lane, Crewe. An existing track to a Network Rail road rail access point (RRAP) at this location would be improved.</p>	<p>The Network Rail RRAP will be relocated approximately 180m north. The existing access from Moss Lane to the Network Rail RRAP will be extended. This requires alterations to landscape mitigation earthworks, a new drainage ditch and alterations to the Hoggins Brook watercourse realignment.</p>
<p>Additional land permanently required for the provision of landscape earthworks adjacent to Footpath Minshull Vernon 8/1 accommodation overbridge</p> <p>AP1-001-006</p> <p>Map CT-06-307, G8 to H6, in the SES1 and AP1 ES Volume 2, MA01 Map Book</p>	<p>Landscape earthworks would be provided on the north-eastern embankment of Footpath Minshull Vernon 8/1 accommodation overbridge and the realigned Parkfield Farm access. There would also be an area of woodland habitat creation at the base of the slope and a HS2 maintenance access at the bottom of the landscape earthworks.</p>	<p>Landscape earthworks will be provided on the north-eastern embankment of Footpath Minshull Vernon 8/1 accommodation overbridge and the realigned Parkfield Farm access. These landscape earthworks will be less steep than proposed in the main ES to help integrate the Footpath Minshull Vernon 8/1 accommodation overbridge into the surrounding landscape. As described in the main ES, there will also be an area of woodland habitat creation at the base of the slope and a HS2 maintenance access at the bottom of the landscape earthworks.</p>
<p>Additional land permanently required for the provision of landscape earthworks adjacent to</p>	<p>An area of landscape mitigation planting would be provided along the eastern side of the HS2 route,</p>	<p>A landscape earthwork, 300m long and up to 2m in height, will be provided to the east of the HS2 route, and to the</p>

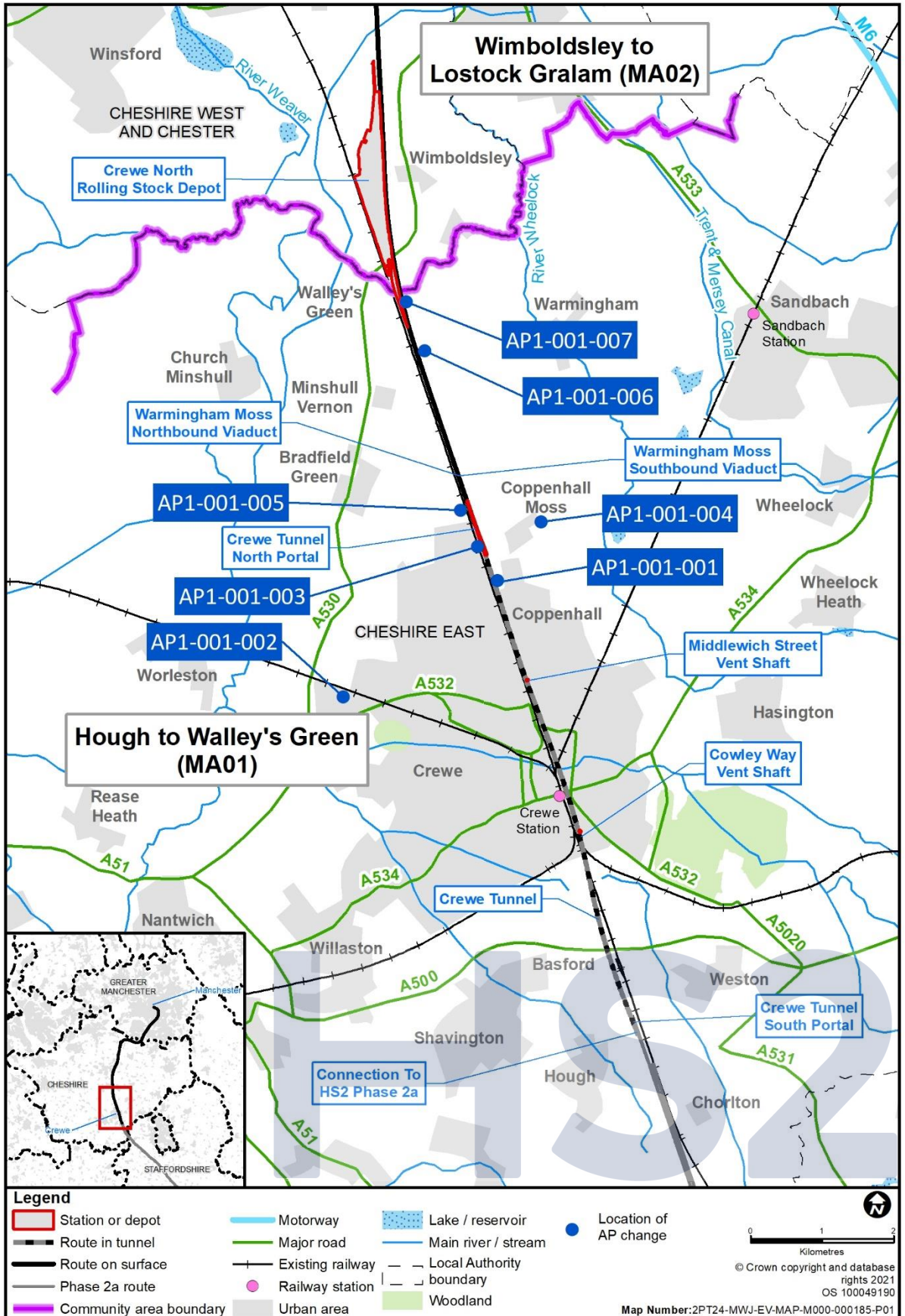
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Name of amendment	Description of the original scheme	Description of the AP1 revised scheme
Coppenhall Moss north embankment AP1-001-007 Map CT-06-308a, A8 to C7, in the SES1 and AP1 ES Volume 2, MA01 Map Book	west of Park House Farm, to help integrate the HS2 route into the surrounding landscape.	west of Park House Farm, to provide visual screening. This new landscape earthwork will adjoin the landscape earthwork along Walley's Green embankment in the Wimboldsley to Lostock Gralam area (MA02).

Figure 2: Locations of engineering amendments in the Hough to Walley's Green area



5 Assessment of engineering amendments in the Hough to Walley's Green area

5.1 Additional land permanently required for the realignment and extension of Crewe tunnel (AP1-001-001)

5.1.1 The Bill provides for Crewe tunnel, a twin-bored tunnel, 6.2km in length, passing under Crewe. The top of the bored tunnel would be up to 35m below ground level. Track level would be up to 43m below ground level. The HS2 route would enter Crewe tunnel 350m north of the existing Newcastle Road and continue north underneath Crewe before emerging from Crewe tunnel north portal, north of the B5076 Bradfield Road. There would be two vent shafts along the length of Crewe tunnel, at Cowley Way and Middlewich Street (see maps CT-06-302 to CT-06-305 in Volume 2, MA01 Map Book of the main ES).

5.1.2 The Bill provides for the following key permanent features in this section:

- Crewe tunnel south portal;
- pumping stations and storage tanks for both railway drainage and public water and sewerage;
- underground attenuation tanks for railway drainage;
- Cowley Way vent shaft auto-transformer station;
- three electricity substations;
- Cowley Way vent shaft and headhouse;
- diversion of utility services;
- Middlewich Street vent shaft and headhouse;
- Crewe tunnel north portal auto-transformer station;
- areas of landscape earthworks and landscape mitigation planting;
- Crewe tunnel north portal;
- Crewe north portal cutting (retained cutting);
- a combined public water sewerage pumping station;
- extension of the existing Parkers Road Overbridge;
- noise fence barriers;
- ecological mitigation ponds;
- Coppenhall Moss cutting;
- Coppenhall Moss south embankment;
- Coppenhall Moss north embankment;
- diversion of a section of Footpath Crewe 29/1;

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- Footpath Crewe 29/1 accommodation overbridge; and
 - Footpath Crewe 29/1 offline culvert.
- 5.1.3 Since the main ES, there has been further design development of Crewe tunnel. The vertical alignment of the tunnel has been revised to reduce ground-borne noise effects. This revision of the vertical alignment led to the need to extend the tunnel to the north. In addition, as a result of the extension of the tunnel, changes to the tunnel porous portals have been identified relating to aerodynamic performance during operation. Due to the extension of the tunnel northwards, the existing Parkers Road overbridge will be retained.
- 5.1.4 Crewe tunnel will be extended by 620m to the north and will emerge 60m to the north of Parkers Road. The total length of Crewe tunnel will be 6.8km (see SES1 and AP1 ES Volume 2, MA01 Map Book: maps CT-06-301, I6 to CT-06-306, A7).
- 5.1.5 The maximum depth of the tunnel will remain up to 43m below ground level. However, the vertical alignment of the section of tunnel from Middlewich Street vent shaft to the relocated Crewe tunnel north portal will be lowered. To accommodate a required redesign of the tunnel ventilation system, the horizontal alignment of Crewe tunnel will be changed in some sections of the tunnel by up to 19m to the west and up to 25m to the east. This is due to the need for the ventilation shafts to be located between the two tunnel bores, rather than above only one tunnel bore.
- 5.1.6 The required redesign of the tunnel ventilation system has led to the redesign of the Cowley Way and Middlewich Street vent shafts and headhouse buildings. Cowley Way vent shaft headhouse will increase in height from 10.3m to 11.3m and will be re-orientated to suit the new tunnel alignment. Middlewich Street vent shaft headhouse will decrease in height from 7.3m to 4m and change from a circular to a rectangular structure. The headhouse structures will increase in area to 2161m². Middlewich Street vent shaft and Cowley Way vent shaft will both decrease in internal diameter by 7m from 24m to 17m.
- 5.1.7 Crewe tunnel south porous portal will be extended by 100m, to a length of 250m. There will be an increase in the dimensions of Crewe tunnel south portal building from 27.2m by 23.9m and 6.6m in height, to 27.8m by 25.4m and 7.1m in height.
- 5.1.8 Crewe tunnel north portal will be relocated approximately 620m north. The porous portal will be extended by 25m, to a length of 175m. There will be an increase in the dimensions of Crewe tunnel north portal building from 27.2m by 23.9m and 6.6m in height, to 27.8m by 25.4m and 7.1m in height.
- 5.1.9 As part of this amendment, the following modifications will be required:
- Crewe tunnel south portal telecommunications site will be located within the redesigned Crewe tunnel south portal building (see SES1 and AP1 ES, Volume 2, MA01 Map Book: map CT-06-302, B6);
 - a pumping station and pumping station storage tank for railway drainage will be located within the redesigned Crewe tunnel south portal building (see SES1 and AP1 ES, Volume 2, MA01 Map Book: map CT-06-302, B6);

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- there will be a minor change to the location of Cowley Way vent shaft auto-transformer station, which will remain adjacent to, and to the south of, Cowley vent shaft and headhouse (see SES1 and AP1 ES, Volume 2, MA01 Map Book: map CT- CT-06-303, G6);
- Crewe tunnel north portal auto-transformer station, including a railway telecommunications mast up to 15m in height, will be located within the site of the redesigned and relocated Crewe tunnel north portal building (see SES1 and AP1 ES, Volume 2, MA01 Map Book: map CT-06-306, A7);
- there will be a minor change to the location of a substation, 20m by 20m in area, which will remain adjacent to the north side of Parkers Road, to the east of the HS2 route (see SES1 and AP1 ES, Volume 2, MA01 Map Book: map CT-06-305, J6);
- the existing Parkers Road Overbridge will be retained. A temporary road closure for reconstruction of the overbridge will no longer be required. A temporary footbridge which was to be installed during reconstruction of the overbridge will no longer be required;
- a pumping station and pumping station storage tank for railway drainage, which will be relocated north, to be adjacent to the redesigned and relocated Crewe tunnel north portal building (see SES1 and AP1 ES, Volume 2, MA01 Map Book: map CT-06-306, A7);
- some of the proposed permanent diversion or decommissioning of minor utilities within the vicinity of Crewe north portal cutting (retained cutting), including some Scottish Power overhead power lines and underground cables, United Utilities wastewater sewers and United Utilities water mains will no longer be required (see SES1 and AP1 ES, Volume 2, MA01 Map Book: map CT-06-301 to CT-06-308a);
- Crewe north portal cutting (retained cutting) will increase in length by 33m to 626m (see SES1 and AP1 ES, Volume 2, MA01 Map Book: map CT-06-306);
- the combined public water sewerage pumping station, located adjacent to Parkers Road, to reconnect the network crossing Parkers Road Overbridge will no longer be required;
- Coppenthal Moss cutting will no longer be required;
- Coppenthal Moss south embankment will decrease in length by 456m to 408m (see SES1 and AP1 ES, Volume 2, MA01 Map Book: map CT-06-306);
- Coppenthal Moss north embankment will decrease in length by 28m to 2,672m (see SES1 and AP1 ES, Volume 2, MA01 Map Book: map CT-06-306 to map CT-06-308a);
- Footpath Crewe 29/1 accommodation overbridge crossing the HS2 route and the WCML, will pass over Crewe north portal cutting (retained cutting) with a greater span and revised earthworks and access ramps. There will be an additional retaining wall to support the landscape earthworks (see SES1 and AP1 ES, Volume 2, MA01 Map Book: map CT-06-306, D7); and
- at the north portal, access into the relocated Crewe north main compound will be provided on the northern side of Parkers Road (see SES1 and AP1 ES, Volume 2, MA01 Map Book: map CT-06-306, A7).

- 5.1.10 The amendment will require the following modifications to mitigation measures described in the main ES:
- redesign of an area of landscape mitigation planting, associated with Middlewich Street vent shaft and headhouse, to allow for the redesigned headhouse structure (see SES1 and AP1 ES, Volume 2, MA01 Map Book: map CT-06-304, I5 to J6);
 - removal of four areas of landscape mitigation planting south of Parkers Road, as no longer required due to changes to Crewe tunnel (see SES1 and AP1 ES, Volume 2, MA01 Map Book: map CT-06-305, G6 to J6);
 - redesign of grassland planting and woodland planting due to changes to Crewe tunnel (see SES1 and AP1 ES, Volume 2, MA01 Map Book: map CT-06-305, H6 to J8 and map CT-06-306, A7 to D7);
 - additional mitigation ponds added to grassland planting, due to removal of ponds during construction (see SES1 and AP1 ES, Volume 2, MA01 Map Book: map CT-06-305, H6 to J8);
 - redesign of a noise fence barrier, reduced from 1.3km in length and up to 5m in height to 880m in length and 3m in height, located along the western side of the HS2 route (see SES1 and AP1 ES, Volume 2, MA01 Map Book: map CT-06-306, C7 to H7);
 - relocation of a noise fence barrier, 960m in length and 3m in height, located along the western side of the existing and realigned WCML (see SES1 and AP1 ES, Volume 2, MA01 Map Book: map CT-06-305, J6 to map CT-06-306, F6); and
 - redesign of landscape earthworks, with associated landscape mitigation planting, along the east of Coppenhall Moss south embankment (see SES1 and AP1 ES, Volume 2, MA01 Map Book: map CT-06-306, D7 to I7).
- 5.1.11 Works to construct the realigned and extended Crewe tunnel will take up to seven years and six months commencing in 2026. Works will be managed from the relocated Crewe tunnel north main compound, Crewe tunnel south portal satellite compound, Cowley Way vent shaft satellite compound and Middlewich Street vent shaft satellite compound.
- 5.1.12 Crewe tunnel north main compound will be relocated, adjacent to the HS2 route, to the north-east of Parkers Road, and will be increased in size from approximately 10.9 ha to approximately 11.9 ha (see SES1 and AP1 ES, Volume 2, MA01 Map Book: map CT-05-305, G6 to J8).
- 5.1.13 Some of the land required for this amendment is outside the limits of the Bill. An additional 49.4ha of land would be permanently required for the AP1 revised scheme. However, due to the relocation of Crewe tunnel north main compound, the amendment will result in a net 20.6ha reduction in land permanently required for the AP1 revised scheme.
- 5.1.14 Demolitions at the properties shown in Table 4, which were described in the main ES, will no longer be required.

Table 4: Demolitions no longer required as a result of extension of the Crewe tunnel and associated works (AP1-001-001)

Type	Description	Location
Residential	One residential property with outbuildings	Bridge Farm, Parkers Road, Crewe
Commercial	Farm	Bridge Farm, Parkers Road, Crewe

Local alternatives

- 5.1.15 The SES1 and AP1 Alternatives report (see SES1 and AP1 ES Volume 5, Appendix: CT-003-00000) describes the local alternatives considered as part of the design development of this amendment.

Topics included in the AP1 assessment

- 5.1.16 The assessment of this AP1 amendment has identified new, different or removed likely significant effects for the following topics: agriculture, forestry and soils; community; ecology and biodiversity; health; historic environment; land quality; landscape and visual; socio-economics; sound, noise and vibration; traffic and transport; and water resources and flood risk.
- 5.1.17 The assessment of the changes to traffic flows and traffic related effects as a result of this amendment in combination with all SES1 changes and AP1 amendments, is reported in Section 7. Topics where a significant effect has been identified due to changes to traffic flows are reported in Section 7 and include air quality.

Agriculture, forestry and soils

Scope, assumptions and limitations

- 5.1.18 The assessment scope, key assumptions and limitations for agriculture, forestry and soils are as set out in Volume 1 and the EIA Scope and Methodology Report (SMR)⁷ of the main ES.
- 5.1.19 This amendment has the potential to result in new or different significant construction effects only. Therefore, there is no operational assessment for agriculture, forestry and soils.

Environmental baseline

Existing environmental baseline

- 5.1.20 The baseline agriculture, forestry and soils information for the Hough to Walley's Green area is as described in Volume 2, Community Area report: MA01, Section 4 of the main ES.
- 5.1.21 The agricultural land associated with this amendment has soil in the Crewe association. These soils are fine loamy over clay soils, developed in reddish, stoneless, glacial till and lake deposits overlying the Sidmouth Mudstone. These soils are seasonally waterlogged for long

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periods during the winter (Wetness Class IV) and the land is limited by soil wetness to Subgrade 3b.

- 5.1.22 Five holdings, affected by the original scheme, will be further affected by this amendment; one new holding (Land at Parkers Road, MA01/30) will also be affected. The characteristics of these holdings are summarised in Table 5.

Table 5: Summary characteristics of holdings affected by the realignment and extension of Crewe tunnel

Holding reference/name	Holding type	Holding size (ha)	Diversification	Agri-environment scheme	Sensitivity to change
MA01/4 Oakhanger Hall ^	Dairy and arable	304	Game shoot	ELS	Medium
MA01/6 Church Farm *	Grassland	187	Not known	None	Medium
MA01/7 Chaise Farm *	Grassland	24	Not known	None	Medium
MA01/8 Bridge Farm	Grassland	1.3	None	None	Low
MA01/9 Moss Bridge Farm (Winton Equestrian Centre)	Riding school and livery yard	7.2	Phone mast	None	Medium
MA01/30 * Land at Parkers Road	Grassland	3.0	None	None	Low

** It has not been possible to arrange a farm impact assessment interview with this holding. Publicly available sources have been used to obtain the information presented.*

^ Included in HS2 Phase 2a assessment, see High Speed Rail (West Midlands - Crewe) Environmental Statement Volume 2, Community Area report: CA5, South Cheshire.

Future environmental baseline

- 5.1.23 The Planning data report of the main ES (see Volume 5, Appendix: CT-004-00000 of the main ES) provides details of committed developments assumed to have been implemented by 2025. This information has been supplemented by the committed developments listed in the equivalent Volume 5 Planning data report of the SES1 and AP1 ES (see SES1 and AP1 ES Volume 5, Appendix: CT-004-00000). These committed developments have been considered to determine whether they would result in a change to the future baseline or have the potential to give rise to cumulative effects. None of the identified committed developments affect the assessment of the AP1 revised scheme's likely construction and operation impacts on agriculture, forestry and soil.

Effects arising during construction

Avoidance and mitigation measures

5.1.24 No mitigation measures additional to those reported in the main ES and draft Code of Construction Practice (CoCP)¹ are required.

Assessment of impacts and effects

- 5.1.25 The amendment will require different amounts of agricultural land from the original scheme and will result in differing impacts and effects on the holdings affected.
- 5.1.26 In terms of the impact on agricultural land, as the amendment will increase the length of the tunnel, the area of agricultural land required is reduced by approximately 1.0ha. The land no longer required is lower quality land in Subgrade 3b. The amendment will make no difference to the overall effect on best and most versatile (BMV) agricultural land during construction which remains as reported in the main ES and is moderate adverse, which is significant.
- 5.1.27 Table 6 and Table 7 provide details on the temporary and permanent impacts on the various holdings affected by the amendment.

Table 6: Summary of temporary impacts and effects on holdings from construction of the realigned and extended tunnel

Holding reference/ name	Total area required from holding	Construction severance	Disruption	Scale of construction effect	Change in effect from main ES
MA01/4 Oakhanger Hall	5.1ha (2%) Negligible	Negligible	Negligible	Negligible	No change
MA01/6 Church Farm	<0.1ha (<1%) Negligible	Negligible	Negligible	Negligible	No change
MA01/7 Chaise Farm	4.7ha (<20%) Medium	Negligible	Negligible	Moderate adverse due to the proportion of land required	Change from major/moderate adverse
MA01/8 Bridge Farm	<0.1ha (<1%) Negligible	Negligible	Negligible	Negligible	Change from moderate adverse
MA01/9 Moss Bridge Farm (Winton Equestrian Centre)	7.2ha (100%) High	Negligible	Medium	Major/moderate adverse due to the proportion of land required	No change
MA01/30 Land at Parkers Road	3.0ha (100%) High	Negligible	Negligible	Moderate adverse due to the proportion of land required	New holding affected

Table 7: Permanent impacts and effects on holding from construction of the realigned and extended tunnel

Holding reference/ name	Land required from holding	Severance	Infrastructure	Scale of effect	Change in effect from main ES
MA01/4 Oakhanger Hall	0.7ha (<1%) Negligible	Negligible	Negligible	Negligible	No change
MA01/6 Church Farm	0ha (0%) Negligible	Negligible	Negligible	Negligible	No change
MA01/7 Chaise Farm	4.7ha (>20%) Medium	Negligible	Negligible	Moderate adverse due to the proportion of land required	Change from negligible
MA01/8 Bridge Farm	<0.1ha (70%) Negligible	Negligible	Negligible	Negligible	Change from moderate adverse
MA01/9 Moss Bridge Farm (Winton Equestrian Centre)	4.3ha (60%) High	Negligible	High (property demolition)	Major/moderate adverse due to the proportion of land required and property demolition	No change
MA01/Land at Parkers Road	0ha (0%) Negligible	Negligible	Negligible	Negligible	New holding assessed

Other mitigation measures

5.1.28 The land required temporarily for construction will be restored to its former agricultural condition once the works are completed, following good practice techniques in handling, storing and reinstating soils on that land, as set out in the draft CoCP. No other mitigation has been identified.

Summary of likely residual significant effects

5.1.29 Overall, the amendment will:

- result in a different significant temporary effect on Chaise Farm (MA01/7). The effect will be reduced from major/moderate adverse to moderate adverse, which remains significant;
- remove a temporary moderate adverse significant effect at Bridge Farm (MA01/8);
- introduce a new temporary moderate adverse significant effect for Land at Parkers Road (MA01/30);
- introduce a new permanent moderate adverse significant effect at Chaise Farm (MA01/7); and
- remove a permanent moderate adverse significant effect at Bridge Farm (MA01/8).

Cumulative effects

- 5.1.30 No new, removed or different significant cumulative effects have been identified with other SES1 or AP1 amendments.

Community

Scope, assumptions and limitations

- 5.1.31 The assessment scope, key assumptions and limitations for community are as set out in Volume 1 and the SMR of the main ES.
- 5.1.32 This amendment has the potential to result in new or different significant construction effects only. Therefore, there is no operational assessment for community.
- 5.1.33 Community effects that result from the assessment of the changes to traffic flows as a result of all AP1 amendments in combination with all SES1 changes are reported in Section 7.

Environmental baseline

Existing environmental baseline

- 5.1.34 The baseline community information is as described in Section 6 of Volume 2, Community Area report: Hough to Walley's Green (MA01) of the main ES. A summary of the baseline information relevant to the assessment of the amendment is provided below.
- 5.1.35 Crewe comprises approximately 30,000 residential properties. The route of the original scheme passes underneath Crewe in tunnel. Crewe has several suburbs including Leighton, Maw Green, Sydney and Coppenhall Moss.
- 5.1.36 There are two residential properties located on Parkers Road affected by the original scheme; Moss Bridge Farm to the north of the road, and Bridge Farm to the south. Winton Equestrian Centre, at Moss Bridge Farm, is a livery yard and stables, which is located to the north of Parkers Road.
- 5.1.37 Healthcare facilities relevant to the assessment of the amendment include Bentley Manor Care Home, a residential nursing home for elderly residents requiring physical or mental support. Sherborne Court Neurological Centre, a specialist health care facility that serves adults of all ages with mental health conditions, physical disabilities, brain injuries, motor neurone disease and Parkinson's disease, is also located within the study area.
- 5.1.38 Yellow Park in Crewe is an area of informal open space between the WCML and the B5067 Middlewich Street. There is a children's play area located at the northern end of Yellow Park.

Future environmental baseline

- 5.1.39 The Planning data report of the main ES (see Volume 5, Appendix: CT-004-00000 of the main ES) provides details of committed developments assumed to have been implemented by

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2025. This information has been supplemented by the committed developments listed in the equivalent Volume 5 Planning data report of the SES1 and AP1 ES (see SES1 and AP1 Volume 5, Appendix: CT-004-00000). These committed developments have been considered as part of a future baseline where relevant.

5.1.40 Committed developments of relevance to the community assessment that would materially alter the future baseline during construction of the AP1 revised scheme in this area, are set out in Table 8.

Table 8: Committed developments of relevance to community during construction

Map book reference ¹⁵	Planning reference	Description	How this is considered in the assessment
MA01/460A	n/a	<p>Location: Royal Arcade Development Area</p> <p>The council will support opportunities for improving and regenerating Crewe town centre in the development areas defined in this policy 'Crewe town centre development areas'. To achieve this aim, alongside applying policies relevant to all town centres, the following considerations will also apply:</p> <p>Royal Arcade Development Area (RADA): A comprehensive, leisure-led mixed use regeneration scheme will be supported in principle in the RADA central core. The scheme should:</p> <ul style="list-style-type: none"> i. be anchored by a multiplex cinema; ii. include leisure and retail units, and potentially other main town centre uses; iii. be designed with open streets with active building frontages; iv. include a new multi storey car park, available for all town centre visitors; v. provide attractive and safe routes through the area for pedestrians and cyclists between Victoria Street, Queensway, Delamere Street and Charles Street; vi. provide a new bus interchange to replace the existing bus station; and vii. provide main gateway connections into the core of the town centre at the junction of Queensway and Victoria Street. 	Informing future baseline
MA01/462A	n/a	<p>Location: Civic and Cultural Quarter Development Area (CCQDA)</p> <p>The council will support opportunities for improving and regenerating Crewe town centre in the development areas defined in this policy 'Crewe town centre development areas'. To achieve this aim, alongside applying policies relevant to all town centres, the following considerations will also apply:</p> <p>Civic and Cultural Quarter Development Area (CCQDA): The following development schemes will be supported:</p> <ul style="list-style-type: none"> i. the re-use or redevelopment of the former library buildings for a range of civic, cultural, community and other town centre uses, including a potential history centre; ii. the flexible use of Crewe Market Hall, to remain functioning primarily as a market, but allowing for other appropriate uses, 	Informing future baseline

¹⁵ Volume 5, Planning Data/Committed Development Map Book: maps CT-13-301 to CT-13-304a-R1.

Map book reference ¹⁵	Planning reference	Description	How this is considered in the assessment
		for example, for entertainment and community events; and iii. the re-use of Christ Church for a cultural, leisure, entertainment, community or other town centre use (or uses), respecting its grade II listed status.	

- 5.1.41 The following committed developments have been included as part of the future baseline and considered within this assessment:
- MA01/460A will result in a new leisure use development, including a cinema located 260m to the west of the land required for the construction of the SES1 scheme; and
 - the implementation of committed development MA01/462A will result in a range of civic, cultural, community and other town centre uses located 85m to the west of the land required for the construction of the SES1 scheme.

Effects arising during construction

Avoidance and mitigation measures

- 5.1.42 No avoidance or mitigation measures, additional to those reported in the main ES and draft CoCP, are required.

Assessment of impacts and effects

- 5.1.43 The main ES reported the demolition of Bridge Farm due to construction of Crewe north portal cutting (retained cutting). As a result of this amendment, there will be a change to the land required for the construction of the AP1 revised scheme. This means that Bridge Farm will not be demolished as a result of this amendment.
- 5.1.44 This amendment will result in a new major adverse in-combination effect on approximately 10 residential properties at the junction of Warmingham Road and Waldron’s Lane in Coppenhall Moss. New significant airborne noise effects are expected to combine with new significant visual effects for approximately two years and five months. Warmingham Road is a construction traffic route and will experience a significant increase in HGV traffic. This significant HGV traffic effect¹⁶ will combine with the noise and visual effects at these properties. Together, these noise, visual and HGV traffic effects will result in a new major adverse in-combination effect on amenity for residents at these properties, which is significant.

¹⁶ HGV traffic effects are where there is a 30% or more increase in HGV traffic movements which have been identified as significant by traffic and transport. The increase in HGV traffic results in a traffic-related severance effect for non-motorised users. They contribute to in-combination effects on community resources that are located adjacent to the routes that experience the increase in HGV movements.

- 5.1.45 The main ES reported a major adverse in-combination effect on approximately 250 residential properties in the vicinity of Broughton Road, Coppenhall. Significant airborne noise effects were expected to combine with significant visual and significant air quality effects for approximately five years and six months during the daytime, two years and four months during the evening, and two years and six months during the night-time. Properties were also expected to experience significant road traffic noise effects. This amendment will remove the significant noise effect. The amendment will also remove the significant visual effects on these properties that were reported in the main ES. This will result in a different significant adverse in-combination effect on amenity for residents of approximately 250 properties in the vicinity of Broughton Road, Coppenhall.
- 5.1.46 The main ES reported a moderate adverse in-combination effect on approximately 45 residential properties in the vicinity of Wareham Drive, Crewe. Significant airborne noise effects were expected to combine with significant visual effects for approximately six months. This amendment will remove the significant noise and visual effects. This will result in the removal of the significant in-combination effect on amenity for residents of approximately 45 properties in the vicinity of Wareham Drive, Crewe.

Other mitigation measures

- 5.1.47 No mitigation measures, additional to those reported in the main ES and draft CoCP, have been identified.

Summary of likely residual significant effects

- 5.1.48 The amendment will result in a new residual effect on approximately 10 residential properties at the junction of Warmingham Road and Waldron's Lane, Coppenhall Moss, due to HGV traffic effects and new noise and visual effects.
- 5.1.49 The amendment will result in a different residual effect on approximately 250 residential properties in the vicinity of Broughton Road, Coppenhall, due to significant road traffic noise and air quality effects, and the removal of noise and visual effects.

Cumulative effects

- 5.1.50 No new, removed or different significant cumulative effects have been identified compared to the main ES.

Ecology and biodiversity

Scope, assumptions and limitations

- 5.1.51 This amendment has the potential to result in new or different significant construction effects only. Therefore, there is no operational assessment for ecology and biodiversity.
- 5.1.52 The assessment scope, key assumptions and limitations for ecology and biodiversity are as set out in Volume 1 and the SMR of the main ES.

- 5.1.53 Where there are limitations in data, a precautionary baseline has been taken following the approach set out in the SMR which constitutes a 'reasonable worst-case' basis for the subsequent assessment.
- 5.1.54 Ecology and biodiversity effects that result from the assessment of the changes to traffic flows as a result of all AP1 amendments in combination with all SES1 changes are reported in Section 7.

Environmental baseline

Existing environmental baseline

- 5.1.55 The baseline ecology and biodiversity information is as described in Section 7 of Volume 2, Community Area report: Hough to Walley's Green (MA01) of the main ES. A summary of the baseline information relevant to the assessment of the AP1 amendment is provided below.

Designated sites

- 5.1.56 The land required for the amendment is located within the Natural England Impact Risk Zone (IRZ) for Sandbach Flashes Site of Special Scientific Interest (SSSI), which is of national value. The SSSI is located west of Sandbach, and the closest component unit is approximately 1.1km east of the land required for the construction of the amendment.
- 5.1.57 There are two LWS of relevance to the assessment of the amendment, which are of county/metropolitan value. These are:
- Moss Bridge Marsh LWS, covering an area of approximately 4.6ha, located partially within the land required for the construction of the amendment; and
 - Spring Plantation Grassland LWS, covering an area of 1.1ha, located 410m north-west of land required for the construction of the amendment.

Habitats

- 5.1.58 Habitats within the land required for construction of the amendment include semi-natural broadleaved woodland, semi-improved acid grassland, semi-improved neutral grassland, marshy grassland, improved grassland, tall ruderal vegetation, one pond, scattered trees, bare ground, hardstanding, and hedgerows. The habitats of relevance to the assessment of the amendment are described in further detail below.
- 5.1.59 A small copse of semi-natural broadleaved woodland, covering an area of 0.1ha, occurs to the east of the WCML, north of Bradfield Road. This habitat is likely to qualify as lowland mixed deciduous woodland, which is a habitat of principal importance listed under the provisions of Section 41 of the Natural Environment and Rural Communities (NERC) Act (2006) and a conservation priority of the Cheshire Biodiversity Action Plan (BAP). This woodland was partially located within the land required for the construction of the original scheme. However, as a result of the amendment, this woodland is not within the land

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required for the construction of the AP1 revised scheme. This woodland is part of a resource of small areas of woodland each less than 1.5ha and each up to local/parish value.

- 5.1.60 Semi-improved acid grassland, covering an area of 2ha, is present at Coppenhall, to the east of the WCML. The grassland is likely to qualify as lowland acid grassland, a habitat of principal importance. This grassland was located partially within land required for the original scheme. However, as a result of the amendment, this grassland is no longer within land required for the AP1 revised scheme. The grassland is of district/borough value.
- 5.1.61 Semi-improved neutral grassland, covering an area of 1.2ha, is located between Coppenhall and Coppenhall Moss, to the south of Parkers Road, Crewe. The grassland is likely to qualify as lowland meadow, a habitat of principal importance. This grassland was located partially within land required for the original scheme. However, as a result of the amendment, this grassland is not within land required for the construction of the AP1 revised scheme. The grassland is of district/borough value.
- 5.1.62 Semi-improved neutral grassland and marshy grassland, covering an area of 3.9ha, occurs north of Parkers Road, Crewe. The grassland is likely to qualify as lowland meadow, a habitat of principal importance. The grassland was located partially within the land for the construction of the original scheme and remains partially within the land required for the construction of the AP1 revised scheme although the location and extent of the affected area differs. The grassland is of district/borough value.
- 5.1.63 Semi-improved neutral grassland and marshy grassland, covering an area of 5.9ha, is present partially within and adjacent to Moss Bridge Marsh LWS. This LWS is located to the east of the WCML, north of Crewe, partially within the land required for the construction of the original scheme. Land required for the AP1 revised scheme includes 2.6ha of additional marshy and semi-improved grassland within Moss Bridge Marsh LWS. This grassland is of county/metropolitan value.
- 5.1.64 On a precautionary basis, it is assumed that ponds within the land required for construction of the amendment are a habitat of principal importance and a conservation priority of the Cheshire BAP. This includes one pond, located within land required for the original scheme, which is not within land required for construction of the amendment. There are a further two ponds, previously located within an area of grassland creation as part of the original scheme, which as a result of the amendment, are now located within land required for the construction of the AP1 revised scheme. These ponds are all of up to district/borough value.
- 5.1.65 Hedgerows within the land required for construction of the amendment are predominantly species poor. The hedgerows are located along field boundaries both north and south of Parkers Road and are assumed to qualify as a habitat of principal importance and a conservation priority of the Cheshire BAP. These contribute towards a wider hedgerow network within the Hough to Walley's Green area that is of county/metropolitan value.

Species

- 5.1.66 Protected and notable species that are known or assumed to occur within the land required for construction of the amendment include lesser silver water beetle, great crested newt, bats, barn owl and small-leaved lime. The species of relevance to the assessment of the amendment are described in further detail below.
- 5.1.67 The main ES reported a population of lesser silver water beetle in a pond near Moss Bridge Farm. This species of beetle was recorded during field surveys in a pond north of Parkers Road within land which had been identified for habitat creation or enhancement, as part of the original scheme, but is now within land required for the construction of the amendment. The lesser silver water beetle is rare in the UK with Cheshire being one of only a few locations known to support the species. It is classified as endangered and is a conservation priority of the local BAP. The population is of regional value.
- 5.1.68 The main ES reported a great crested newt meta-population in a network of ponds to the north of Crewe (GCNMP1.1.17). The land required for construction of the amendment south of Parkers Road includes terrestrial habitat associated with three ponds with confirmed or assumed populations of great crested newt. Great crested newt is an Annex 2 species, a species of principal importance, and a conservation priority of the Cheshire BAP. The meta-population is of county/metropolitan value.
- 5.1.69 The main ES reported a great crested newt meta-population in a network of ponds to the north of Crewe and south-east of Middlewich (GCNMP1.1.19). The land required for construction of the amendment north of Parkers Road includes terrestrial habitat associated with this meta-population which is of county/metropolitan value.

Future environmental baseline

- 5.1.70 The Planning data report of the main ES (see Volume 5, Appendix: CT-004-00000 of the main ES) provides details of committed developments assumed to have been implemented by 2025. This information has been supplemented by the committed developments listed in the equivalent Volume 5 Planning data report of the SES1 and AP1 ES (see SES1 and AP1 Volume 5, Appendix: CT-004-00000). These committed developments have been considered as a future baseline where relevant, and their potential to give rise to cumulative effects has been assessed. None of the identified developments affect the assessment of the likely construction impacts on ecology and biodiversity from the amendment.

Effects arising during construction

Avoidance and mitigation measures

- 5.1.71 No avoidance or mitigation measures, additional to those reported in the main ES and draft CoCP, are required.

Assessment of impacts and effects

Designated sites

- 5.1.72 The main ES reported the assessment of potential hydrological impacts on Sandbach Flashes SSSI in Volume 2, Community Area report: Hough to Walley's Green (MA01) of the main ES and concluded that there would be no significant permanent adverse effects on either surface water or ground water flow to the SSSI. The main ES, therefore, reported that Sandbach Flashes SSSI would not be affected by the construction of the original scheme. As a result of the amendment, this assessment reports a potential moderate impact on hydrology at the SSSI due to a potential reduction in flow of Tributary of Fowle Brook 1, which flows into Bottoms Flash and Groby's Flash, the most southern unit of the SSSI. On a precautionary basis, this is assumed to result in an adverse effect on any surface water dependent habitats present within these units of the SSSI. The effects of any potential waterborne pollution will be avoided through implementation of the measures in the draft CoCP including, so far as is reasonably practicable, adopting good working practices for pollution prevention. On a precautionary basis, the impact on hydrology caused by the amendment will result in a permanent adverse effect that is significant at the national level. Surveys are required to confirm whether there is an existing connection between Tributary of Fowle Brook 1 and the land to the west of the WCML. If a connection does currently exist then mitigation may be required, to ensure that flows to Sandbach Flashes SSSI are maintained, as far as reasonably practicable. This additional mitigation may include consideration of measures to allow flood flows to pass across the AP1 revised scheme, such as provision of a surface water flow path realignment and culvert to allow flood flows to pass beneath Coppenhall Moss South Embankment, or pumping flood flows across the AP1 revised scheme. Additional surveys and hydraulic analysis will be undertaken during design development in collaboration with Environment Agency and Natural England, in order to identify and agree the significance of any ecological effects resulting from any hydrological change. If required, an appropriate mitigation strategy will be developed to avoid significant effect on the conservation status of Sandbach Flashes SSSI, as far as is reasonably practicable.
- 5.1.73 The main ES reported that construction of the original scheme would result in the permanent loss of 2.7ha (59%) of Moss Bridge Marsh LWS and a localised reduction in groundwater levels, which would result in a permanent adverse effect on the structure and function of the LWS that is significant at the county/metropolitan level. The amendment will result in the loss of an additional 620m² of marshy grassland from within Moss Bridge Marsh LWS, and a change to a moderate reduction in groundwater levels. However, this will not change the level of significance of the effect on the LWS as reported in the main ES.
- 5.1.74 The main ES reported that construction of the original scheme would result in the loss of 0.4ha (32%) of Spring Plantation Grassland LWS, which would result in a permanent adverse effect on the structure and function of the LWS that is significant at the county/metropolitan level. The amendment will result in in localised reduction in groundwater levels, which may

have an additional adverse effect on the structure and function of the LWS. However, this will not change the level of significance of the effect on the LWS as reported in the main ES.

Habitats

- 5.1.75 The main ES reported the loss of 2ha of semi-improved acid grassland at Coppenhall and 0.8ha of semi-improved neutral grassland between Coppenhall and Coppenhall Moss, resulting in a significant effect at up to district/borough level in each case. The grasslands no longer fall within the land required for construction of the AP1 revised scheme. This will remove the significant effect on semi-improved acid grassland at Coppenhall and semi-improved neutral grassland between Coppenhall and Coppenhall Moss, as reported in the main ES.
- 5.1.76 The amendment will result in the permanent loss of 2.3ha of semi-improved neutral grassland and marshy grassland, north of Parkers Road. The loss of this grassland will result in a different permanent adverse effect that will be significant at up to district/borough level.
- 5.1.77 The main ES reported the loss of 5.6ha of semi-improved neutral grassland and marshy grassland, located within and adjacent to Moss Bridge Marsh LWS, as a result of the original scheme. The loss of this grassland would result in a permanent adverse effect that would be significant at up to county/metropolitan level. The amendment will result in the permanent loss of an additional 620m² of marshy grassland from within Moss Bridge Marsh LWS, though there will be no change in the level of significance of the effect from that reported in the main ES.
- 5.1.78 On a precautionary basis, the main ES reported that 17 of the 21 ponds located within the land required for the original scheme in the Hough to Walley's Green area would be permanently lost, which would lead to an adverse effect on the conservation status of water bodies that would be significant, in each case, at up to district/borough level. The remaining four ponds were assumed to be retained on the basis that these are located within land required for habitat creation. This included two ponds located within an area of grassland creation to the north of Parkers Road. As a result of the amendment, one pond is located within land that is no longer required for construction of the revised scheme, as such this pond will be retained, removing the significant effect associated with the loss of this pond reported in the main ES. The amendment will also result in the relocation of the area of grassland creation from the north to the south of Parkers Road. The two ponds previously assumed to be retained will now be lost to the construction of the amendment, which will also result in a permanent adverse effect on the conservation status of these waterbodies, significant at up to district/borough level in each case. As a result, 18 of the 21 ponds located within the land required for this amendment will be permanently lost.
- 5.1.79 On a precautionary basis, the main ES reported a loss of 28km of hedgerow habitat within the land required for the construction of the original scheme within the Hough to Walley's Green area, resulting in a permanent adverse effect significant at the county/metropolitan level. As a result of the amendment, approximately 975m of species-poor hedgerow and 637m of assumed species-rich hedgerow located to the south of Parkers Road, is no longer

within the land required for the construction of the revised scheme. However, the amendment will result in the loss of approximately 974m species-poor hedgerow and 987m of species-rich hedgerow (of which 930m is assumed to be species-rich) of existing hedgerow north of Parkers Road. The amendment will therefore result in a net increase in hedgerow loss of 349m, which will give rise to a different significant effect to that reported in the main ES. However, this will not change the level of significance.

Species

- 5.1.80 The main ES reported that the pond to the north of Parkers Road, known to support a regionally important population of lesser silver water beetle, and a further potentially suitable pond 25m away, would be within land that had been identified for the purpose of grassland creation as part of the original scheme and therefore it would be possible to retain these ponds and avoid a direct impact on this population. However, as a result of the amendment, this land is now required for the construction of the scheme and will no longer be available for grassland habitat creation, and it is therefore assumed that these ponds will be lost. The loss of these ponds will result in a permanent adverse effect on the population of lesser silver water beetle in ponds north of Parkers Road which will be significant at the regional level.
- 5.1.81 The main ES reported that the loss of habitat resulting from the construction of the original scheme would result in an adverse effect on the population of great crested newt in a network of three ponds to the north of Crewe (GCNP1.1.17), which will be significant at up to county/metropolitan level. As a result of the amendment, one of these ponds is no longer within land required for construction of the revised scheme. Although there will be a reduction in the number of ponds lost as a result of the amendment, the revised scheme will still result in the loss of habitat, which will give rise to a different significant adverse effect on this meta-population of great crested newts. There will be no change in the level of significance of the effects reported in the main ES.
- 5.1.82 The main ES reported that the loss of habitat resulting from the construction of the original scheme would result in an adverse effect on the meta-population of great crested newt in a network of 130 ponds to the north of Crewe and south-east of Middlewich (GCNMP1.1.19), which will be significant at up to county/metropolitan level. As a result of the amendment, the extent of terrestrial habitat associated with this meta-population which will be lost to the AP1 revised scheme will increase. The amendment will result in a different significant adverse effect, but there will be no change in the level of significance of the effect reported in the main ES.

Other mitigation measures

Habitats

- 5.1.83 The main ES states that measures to be taken in response to loss of habitat, including lowland meadow and marshy grassland, from within and adjacent to Moss Bridge Marsh LWS will include re-creation of damp grassland on areas affected during construction. A

combined total of 13ha of additional species-rich grassland will be created on adjacent fields to the north and south of Moss Bridge Marsh LWS and to the south of Spring Plantation Grassland LWS. Due to the extent of habitat creation and measures to ensure the successful establishment, there will be no significant effect on the conservation status of lowland meadow once the habitats have become fully established.

- 5.1.84 Areas of grassland habitat creation detailed in the main ES, including 2.2ha to the south of Larch Wood and 3.6ha to the west of Park House Farm, will be reconfigured to compensate for the loss of 2.3ha of semi-improved neutral grassland and marshy grassland north of Parkers Road. These areas of grassland creation were previously provided to compensate for loss of 2ha of semi-improved acid grassland at Coppenhall, and 0.8ha of semi-improved neutral grassland between Coppenhall and Coppenhall Moss, which as a result of the amendment, are no longer located within land required for construction of the AP1 revised scheme. Following establishment, the adverse effect on semi-improved neutral grassland and marshy grassland will be reduced to a level that is not significant.
- 5.1.85 The main ES states that at least one pond will be created for every pond lost within the original scheme. This principle of mitigation has been applied to the two additional ponds lost as a result of the amendment. Once new ponds are established, it is anticipated that any adverse effect upon pond habitats will be reduced to a level that is not significant.
- 5.1.86 The main ES reports that a total of 10.1km of new hedgerows will be planted as replacement for those lost as a result of the original scheme in the Hough to Walley's Green area. This represents a net reduction in hedgerow of 17.9km after mitigation, which is a residual adverse effect that is significant at the county/metropolitan level. The amendment will result in the loss of an additional 349m of existing hedgerow, which will result in a different residual effect on hedgerow to that reported in the main ES. However, this will not change the significance of the effect on hedgerow within the Hough to Walley's Green area reported in the main ES.

Species

- 5.1.87 The amendment will result in the loss of one pond, known to support lesser silver water beetle, and one pond assumed to support this species, both located north of Parkers Road. The loss of this habitat will be addressed through the provision of new ponds and areas of wet grassland within ecological compensation areas to the south of Parkers Road and north of Moss Bridge Marsh LWS, close to the areas lost. The habitats will be established in accordance with the Ecological Principles of Mitigation within the SMR. Where reasonably practicable, following discussions with relevant stakeholders and if it can be demonstrated to be effective, additional measures including translocation of sediment and vegetation along with adult silver water beetles and larvae will be undertaken as appropriate. Following implementation of these measures, the adverse effect on the lesser silver water beetle population north of Parkers Road will be reduced to a level that is not significant.
- 5.1.88 The main ES reported significant adverse effects on two great crested newt populations and 12 meta-populations within the Hough to Walley's Green area. The adverse effects on great

crested newt would be addressed by the provision of measures within the ecological habitat creation areas north of Parkers Road (now located to the south of Parkers Road as result of the amendment), east of Moss Lane, west of Warmingham Road, south of Larch Wood and west of Park House Farm. These measures would comprise provision of ponds, grassland and woodland that would be designed to compensate for the loss of breeding sites, foraging habitat and places of shelter used by great crested newt. Following implementation, the adverse effects on the amphibian populations in the Hough to Walley's Green area would be reduced to a level that is not significant.

Summary of likely residual significant effects

- 5.1.89 The main ES reports a net loss of 10.1km of hedgerow habitat across the Hough to Walley's Green area, which represents an adverse residual effect that is significant at the county/metropolitan level. The amendment will result in the loss of an additional 349m of hedgerow habitat. However, this will not change the level of significance of the adverse residual effect on hedgerows, as reported within the main ES.
- 5.1.90 The amendment will, on a precautionary basis, result in a permanent adverse effect on the hydrology at Sandbach Flashes SSSI, which is significant at the national level. If required, an appropriate mitigation strategy will be developed to avoid significant effect on the conservation status of Sandbach Flashes SSSI, as far as is reasonably practicable.

Cumulative effects

- 5.1.91 No new, removed or different significant cumulative effects have been identified compared to the main ES.

Health

Scope, assumptions and limitations

- 5.1.92 The assessment scope, key assumptions and limitations for health are as set out in Volume 1 and the SMR of the main ES.
- 5.1.93 This amendment has the potential to result in new or different significant construction effects only. Therefore, there is no operational assessment for health.
- 5.1.94 Health effects that result from the assessment of the changes to traffic flows as a result of all AP1 amendments in combination with all SES1 changes are reported in Section 7.

Environmental baseline

Existing environmental baseline

- 5.1.95 The baseline health information is as described in Section 8 of Volume 2, Community Area report: Hough to Walley's Green (MA01) of the main ES. A summary of the baseline information relevant to the assessment of the amendment is provided below.

- 5.1.96 Crewe comprises approximately 30,000 residential properties. The route of the original scheme passes underneath Crewe in tunnel. Crewe has several suburbs including Leighton, Maw Green, Sydney and Coppenhall Moss.
- 5.1.97 Healthcare facilities relevant to the assessment of the amendment include Bentley Manor Care Home, a residential nursing home for elderly residents requiring physical or mental support. Sherborne Court Neurological Centre, a specialist health care facility that serves adults of all ages with mental health conditions and physical disabilities, is also located within the study area.

Future environmental baseline

- 5.1.98 The Planning data report of the main ES (see Volume 5, Appendix: CT-004-00000 of the main ES) provides details of committed developments assumed to have been implemented by 2025. This information has been supplemented by the committed developments listed in the equivalent Volume 5 Planning data report of the SES1 and AP1 ES (see SES1 and AP1 Volume 5, Appendix: CT-004-00000). These committed developments have been considered as a future baseline where relevant.
- 5.1.99 No committed developments of relevance for the community assessment have been identified that would materially alter the future baseline in this area.

Effects arising during construction

Avoidance and mitigation measures

- 5.1.100 No avoidance or mitigation measures, additional to those reported in the main ES and draft CoCP, are required.

Assessment of impacts and effects

- 5.1.101 Crewe tunnel realignment and extension (AP1-001-001) will result in a new adverse neighbourhood quality effect for residents in the vicinity of Warmingham Road and Waldron's Lane in Coppenhall Moss. Construction of the AP1 revised scheme is expected to be visible from street level in the vicinity of the junction of Warmingham Road and Waldron's Lane. New significant airborne noise effects are expected to last for approximately two years and five months. Warmingham Road is a construction traffic route and will experience a significant increase in HGV traffic. This significant HGV traffic effect will combine with the noise and visual effects in this community. People in this community are likely to experience these effects as changing the quality of their neighbourhood and to regard that change as adverse, in diminishing the amenity of the settlement.
- 5.1.102 The main ES reported an adverse neighbourhood quality effect for residents along the B5076 North Street in Crewe. Significant HGV traffic effects were expected to combine with significant air quality effects. This amendment will remove the significant HGV and air quality effects. This will result in the removal of the neighbourhood quality effect for residents along the B5076 North Street.

- 5.1.103 The main ES reported an adverse neighbourhood quality effect for residents along the B5076 Bradfield Road in Crewe. Significant HGV traffic effects were expected to combine with significant air quality effects. This amendment will remove the significant HGV and air quality effects. This will result in the removal of the neighbourhood quality effect for residents along the B5076 Bradfield Road.
- 5.1.104 The main ES reported an adverse neighbourhood quality effect for residents in the vicinity of Broughton Road, Coppenhall. Construction of the original scheme was expected to be visible from street level in the vicinity of Broughton Road, Coppenhall. Significant noise effects were expected to last for a period of approximately five years and six months during the daytime, two years and four months during the evening, and two years and six months during the night-time. Residents of properties in the vicinity were also expected to experience significant air quality effects, and road traffic noise effects. This amendment will remove the significant noise, visual and air quality effects. Changes to the sound, noise and vibration assessment, as a result of new construction traffic data will remove the traffic related noise effect. This amendment will result in the removal of the neighbourhood quality effect for residents in the vicinity of Broughton Road, Coppenhall.
- 5.1.105 The main ES reported an adverse neighbourhood quality effect for residents in the vicinity of Wareham Drive, Crewe. Construction of the original scheme was expected to be visible from street level in the vicinity of Wareham Drive. Significant noise effects were expected to last for a period of approximately six months. The amendment will remove the significant noise and visual effects. This amendment will result in the removal of the neighbourhood quality effect for residents in the vicinity of Wareham Drive, Crewe.

Other mitigation measures

- 5.1.106 No mitigation measures, additional to those reported in the main ES and draft CoCP, have been identified.

Cumulative effects

- 5.1.107 No new or different significant cumulative effects have been identified further to those identified in the main ES.

Historic environment

Scope, assumptions and limitations

- 5.1.108 The assessment scope, key assumptions and limitations for historic environment are as set out in Volume 1 and the SMR of the main ES.
- 5.1.109 This amendment has the potential to result in new or different significant construction effects only. Therefore, there is no operational assessment for historic environment.

Environmental baseline

Existing environmental baseline

- 5.1.110 The baseline historic environment information is as described in Section 9 of Volume 2, Community Area report: Hough to Walley's Green (MA01) of the main ES. A summary of the baseline information relevant to the assessment of the amendment is provided below.
- 5.1.111 There are no designated heritage assets relevant to the assessment of the amendment.
- 5.1.112 There is one non-designated heritage asset relevant to the assessment of the amendment. Bridge Farm and former farmstead, Parkers Road (MA01_0157) is of low value and lies partially within the land required for the construction of the amendment. The heritage value of the asset lies in its historic and archaeological interest associated with the late 19th century farmhouse and the former early 19th century farmstead, which provide a physical record of historic farming practices. The asset was located wholly within the land required for construction of the original scheme.

Future environmental baseline

- 5.1.113 The Planning data report of the main ES (see Volume 5, Appendix: CT-004-00000 of the main ES) provides details of committed developments assumed to have been implemented by 2025. This information has been supplemented by the committed developments listed in the equivalent Volume 5 Planning data report of the SES1 and AP1 ES (see SES1 and AP1 ES Volume 5, Appendix: CT-004-00000). These committed developments have been considered as a future baseline where relevant.
- 5.1.114 The committed development of a solar farm and associated development (MA01/453S) will alter the baseline conditions in 2025 and 2038 for historic environment.

Effects arising during construction

Avoidance and mitigation measures

- 5.1.115 No mitigation measures additional to those reported in the main ES and draft CoCP, are required.

Assessment of impacts and effects

- 5.1.116 Changes to impacts on heritage assets resulting in a new or different significant effect, cumulative effect, or the removal of a significant effect are described in the assessment below. The SES1 and AP1 Volume 5, Appendix: HE-002-00000 provides a summary of all historic environment effects that have been changed as a result of the amendment.

Temporary effects

- 5.1.117 None of the changes to temporary impacts resulting from the amendment result in a new or different significant effect.

Permanent effects

- 5.1.118 The main ES reported a moderate adverse significant effect on Bridge Farm and former farmstead, Parkers Road (MA01_0157), a non-designated asset of low heritage value. The asset is located within the land required for the construction of the original scheme. The farmhouse would have been demolished and the archaeological remains associated with the former farmstead removed to enable the establishment of Crewe tunnel north main compound. A moderate adverse significant effect is reported in the main ES. The amendment will result in the extension of Crewe tunnel and a change to the land required for the construction of the AP1 revised scheme. This means Bridge Farm and former farmstead, Parkers Road will be retained, and the significant effect reported in the main ES will be removed. However, the asset will be within the 10mm settlement contour associated with Crewe tunnel of the AP1 revised scheme. This will constitute a permanent minimal impact resulting in a negligible adverse non-significant effect.

Other mitigation measures

- 5.1.119 No mitigation measures, additional to those reported in the main ES and draft CoCP, are identified.

Summary of likely residual significant effects

- 5.1.120 The AP1 amendment will remove the likely residual significant effects on Bridge Farm and former farmstead, Parkers Road (MA01_0157).

Cumulative effects

- 5.1.121 No new, removed or different significant cumulative effects have been identified compared to the main ES.

Land quality

Scope, assumptions and limitations

- 5.1.122 The assessment scope, key assumptions and limitations for land quality are as set out in Volume 1 and the SMR of the main ES.
- 5.1.123 This amendment has the potential to result in new or different significant construction effects only. Therefore, there is no operational assessment for land quality.

Environmental baseline

Existing environmental baseline

- 5.1.124 The baseline land quality information is as described in Section 4 of Volume 2, Community Area report: Hough to Walley's Green (MA01) of the main ES. There are no additional baseline data that are specific to this amendment since the preparation of the main ES.
- 5.1.125 The main baseline feature pertinent to this amendment is a garage workshop facility located to the north of Warmingham Road in Copenhall Moss. Due to the change in the land required for construction as a result of this amendment, the garage will be adjacent to the land required for the construction of the AP1 revised scheme. Garage workshops may represent a source of contaminants such as: hydrocarbons including waste oils; heavy metals; and solvents associated with paints and degreasers.

Future environmental baseline

- 5.1.126 The Planning data report of the main ES (see Volume 5, Appendix: CT-004-00000 of the main ES) provides details of committed developments assumed to have been implemented by 2025. This information has been supplemented by the committed developments listed in the equivalent Volume 5 Planning data report of the SES1 and AP1 ES (see SES1 and AP1 Volume 5, Appendix: CT-004-00000). These committed developments have been considered as a future baseline where relevant.
- 5.1.127 None of the identified developments will materially alter the baseline conditions in 2025 or 2038 for land quality.

Effects arising during construction

Avoidance and mitigation measures

- 5.1.128 No mitigation measures additional to those reported in the main ES and draft CoCP are required.

Assessment of impacts and effects

- 5.1.129 There were no significant effects associated with the garage workshop (MA01-195) identified in the main ES. The garage workshop was not taken through to detailed assessment stage in the main ES, partly due to the distance from the land required for the construction of the original scheme.
- 5.1.130 The amendment has resulted in a change to the land required for the construction of the AP1 revised scheme. The garage workshop has now undergone detailed assessment in accordance with the SMR of the main ES.

- 5.1.131 The assessment has concluded that the amendment will not lead to any new likely significant effects for land quality. Further information can be found in SES1 and AP1 ES Volume 5, Appendix: LQ-001-00000.

Other mitigation measures

- 5.1.132 No mitigation measures additional to those reported in the main ES and draft CoCP are required.

Summary of likely residual significant effects

- 5.1.133 There are no changes to the likely residual significant land quality construction effects identified in the main ES as a result of the amendment.

Cumulative effects

- 5.1.134 There are no new or different likely significant cumulative land quality effects as a result of the amendment acting in combination with any other AP1 amendments.

Landscape and visual

Scope, assumptions and limitations

- 5.1.135 The assessment scope, key assumptions and limitations for landscape and visual are as set out in Volume 1 and the SMR of the main ES.
- 5.1.136 This amendment has the potential to result in new or different significant construction effects for landscape together with significant construction and operational effects for visual. Therefore, there is no landscape assessment for operation in this report.
- 5.1.137 All landscape and visual effects, arising from this amendment, are reported in SES1 and AP1 ES Volume 5, Appendix: LV-001-0MA01.

Environmental baseline

Existing environmental baseline

- 5.1.138 The baseline landscape and visual information is as described Volume 5, Appendix: LV-001-0MA01 of the main ES. A summary of the baseline information relevant to the assessment of the amendment is provided below.

Landscape baseline

- 5.1.139 The amendment has the potential to affect seven landscape character areas (LCA), which are described in the SES1 and AP1 ES Volume 5, Appendix: LV-001-0MA01. Of these, the amendment has the potential to significantly affect one LCA which is summarised below.

Crewe Fringe Mosslands LCA

- 5.1.140 The Crewe Fringe Mosslands LCA is a predominantly flat, agricultural landscape of arable and pastoral farmland forming the northern hinterland of Crewe. It is an area of former mosslands. The field patterns range from distinct, east-west linear arrangements of enclosure at Warmingham, to a mix of linear enclosure and medieval field pattern around Coppenhall Moss. Field boundaries vary from those that are well-maintained to others that are poorly managed. In some areas gapped hedges with frequent mature trees, contribute to a less well defined sense of enclosure. The scenic quality of the area is diminished by the presence of the WCML and by its proximity to the expanding residential edge of Crewe. The resulting sensitivity of this LCA is **medium-low**.

Visual baseline

- 5.1.141 The amendment has the potential to affect 15 viewpoints, which are described in SES1 and AP1 ES Volume 5, Appendix: LV-001-0MA01. Of these, the amendment has the potential to significantly affect 11 viewpoints, which are summarised below.

View north from public open space bordering the B5076 Middlewich Street (medium-high sensitivity receptors) (303-02-001)

- 5.1.142 This viewpoint represents the views experienced by residents on the B5076 Middlewich Street and Audley Street West. It is located within a public open space immediately to the east of the WCML and to the west of the B5076 Middlewich Street close to the centre of Crewe. An area of open green space framed by scrub vegetation and palisade boundary fencing is visible to the west. Views of a number of red brick, terraced properties are filtered through mature trees to the east. The profile of Bentley Manor Care Home forms the skyline in views to the north.

View south-east from public open space bordering the B5076 Middlewich Street (medium-high sensitivity receptors) (303-02-003)

- 5.1.143 This viewpoint represents the views experienced by residents of on the B5076 Middlewich Street and of Bentley Manor Care Home, users of public footpaths, public open space and rail users. The view of the open space to the west of the B5076, near the centre of Crewe, is framed by scrub vegetation with residential properties beyond. Existing overhead line equipment and train movements are just visible to the south. Mature trees along the boundary of Crewe Cemetery are visible on the skyline in the background of the view.

View north-west from Bradfield Road, Crewe (high sensitivity receptors) (303-02-004)

- 5.1.144 This viewpoint represents the views experienced by residents of Broughton Road, between Bradfield Road and Maplins Moss Place. The elevated Bradfield Road Overbridge forms a skyline element where it crosses the WCML to the west. Trees and intermittent woodland are apparent in the middle-distance. There is a lower lying area of unmaintained grassland to the north of Bradfield Road which is framed by mature trees and the WCML with

associated infrastructure. Train movements are intermittently perceptible. Residential development is visible beyond the WCML and partially defines the skyline.

- 5.1.145 At night, artificial lighting within Crewe is evident and local roads are lit. The wider urban extent of Crewe and housing areas to the north create a far distance skyglow.

View east from Somerley Close, Leighton, Crewe (high sensitivity receptors) (304-02-001)

- 5.1.146 This viewpoint represents the views experienced by residents in Somerley Close and users of Footpath Crewe 13/1 in a residential area immediately west of the WCML. There are close range views of single storey properties set within an open plan arrangement with tarmac access road and footpaths. A belt of mature trees substantially filters views towards the WCML, resulting in partial visibility of associated infrastructure, glimpsed views of train movements. Views of residential development beyond WCML, are heavily filtered through intervening vegetation.

View west from Broughton Road, Coppenhall, Crewe (high sensitivity receptors) (304-02-002)

- 5.1.147 This viewpoint represents the views experienced by residents on Broughton Road and of north-facing properties at Maplins Moss Place. It is located to the rear of properties along Broughton Road within the village of Coppenhall to the east of Crewe and the WCML. The view comprises garden boundary fences and vegetation, pastoral fields with overgrown hedgerows and mature hedgerow trees. The WCML associated overhead line equipment is visible on the skyline, with occasional glimpsed views of moving trains beyond the field boundary. This linear belt of trees and shrubs partially screens the WCML and residential development beyond. A linear belt of trees and shrubs alongside the railway partially screens visibility of residential development beyond the WCML. To the north, mature vegetation alongside Parkers Road defines the skyline, with Bridge Farm also visible.
- 5.1.148 At night, the urban section of Broughton Road is lit, while local roads are unlit. Lighting is limited to groups of properties to the south and beyond WCML to the west. There is a far distance skyglow from Crewe immediately to the west.

View north-west from the White Lion Public House, Coppenhall Moss (high sensitivity receptors) (304-02-003)

- 5.1.149 This viewpoint represents the views experienced by residents on Warmingham Road and residents and visitors to The White Lion public house. The view comprises garden vegetation including mature trees, and boundary fences or hedgerows. From the public house the view is more open. In the middle distance there are gently sloping pastoral fields defined by hedgerows with occasional mature trees and tree belts. In the far distance the WCML is viewed against the skyline beyond a landscape of mature hedgerows and trees.
- 5.1.150 At night, Warmingham Road is well lit by street lighting, whilst local roads within the view are unlit with lighting limited to individual properties. The area is predominantly unlit with the wider skyglow generated by Crewe.

View east from Bleasdale Road, Leighton, Crewe (medium-high sensitivity receptors) (304-02-004)

- 5.1.151 This viewpoint represents the views experienced by residents in properties bordering the WCML between Bleasdale Road, Parkers Road and Thornfields and users of Footpaths Crewe 12/2 and 12/1 and the public open space. Views are of a large residential area to the north of Parkers Road and west of the WCML. The open plan layout comprises roads, driveways and footpaths within an estate of detached two-storey properties. In the middle distance a belt of mature trees partially filters views of the WCML although overhead lines are visible and there are occasional glimpsed views of moving trains. Moss Bridge Farm and outbuildings are notable elements beyond the WCML
- 5.1.152 At night, the residential area is well-lit. However, in the middle distance to the east, the adjacent recreational space and WCML are unlit. Well-lit residential areas and street lighting in the far distance, contribute to skyglow.

View west from Footpath Crewe 28/1 (Crewe and Nantwich Circular Walk), Coppenhall Moss (high sensitivity receptors) (304-03-005)

- 5.1.153 This viewpoint represents the views experienced by users of Footpaths Crewe 28/1, 29/1 and 30/1, part of the promoted Crewe and Nantwich Circular Walk. It is located in a rural area and comprises overgrown grassland with tall ruderal grasses and field boundary vegetation of hedgerows and broken belts of shrubs and trees. Post and wire fences separate the footpath from an area of rough pasture and semi-improved pastoral fields in the middle-distance of view. Gaps in the vegetation alongside the footpath allow views towards the WCML, its overhead line equipment and train movements, while pylons and wind turbines are evident on the skyline. There are distant views of buildings associated with Moss Farm to the north, a footbridge over the railway to the west and partial visibility of new residential development on the western side of the railway.

View south-west from Maplins Moss Place, Coppenhall, Crewe (high sensitivity receptors) (304-02-010)

- 5.1.154 This viewpoint represents the views experienced by residents at the westernmost end of Maplins Moss Place, Coppenhall. The view comprises amenity green space adjacent to a local access road with street lighting and two storey dwellings. In the middle-distance mature trees, at the boundary of the housing area substantially filter views. However, the more distant palisade fence which defines the boundary of the WCML is partially visible together with overhead line equipment and glimpsed views of train movements. Mature trees and shrubs along the western boundary of WCML filter longer distance views of the housing area to the west.
- 5.1.155 At night, the view from Maplins Moss Place includes street lighting and the residential area west of the WCML in Crewe generates far distance skyglow above WCML and intervening vegetation. Adjacent fields in the near distance of the view between the viewpoint and WCML are unlit.

5.1.156 The following new viewpoints have been selected as the amendment has the potential to result in new or different significant effects:

- view north-east from Parkers Road (viewpoint 304-03-012); and
- view west from Footpath Crewe 30/1, Kent's Lane (304-03-013).

View north-east from Parkers Road (high sensitivity receptors) (304-03-012)

5.1.157 This new viewpoint is located in an area where there will be changes from the original scheme and represents the views experienced by users of Footpath Crewe 12/2 and road users on Parkers Road. It is situated on Parkers Road, immediately west of the existing Parkers Road Overbridge that crosses the WCML and at the access point to Footpath Crewe 12/2. The view comprises the tracks and overhead line equipment along the WCML corridor, the road, the brick parapets of the overbridge and a section of green palisade boundary fencing. The footpath is bordered to the east by steel palisade fencing and scrub vegetation along the WCML. To the west of the footpath is a linear woodland belt of mature, predominantly deciduous trees and shrubs that mark the edge of Leighton. In longer distance views the paddocks and agricultural buildings of the Moss Bridge Farm (Winton Equestrian Centre) are visible but partially screened by trees growing along the railway corridor.

View west from Footpath Crewe 30/1, Kent's Lane (medium sensitivity receptors) (304-03-013)

5.1.158 This new viewpoint is located in an area where there will be changes from the original scheme and represents the views experienced by users of Footpath Crewe 30/1, residents and road users travelling on Kent's Lane. The view comprises Kent's Lane is a single-track, rural road bordered by grass verges, hedgerows and a wood pole overhead line. This is seen adjacent to an area of pasture contained by hedgerows and a light industrial development to the northwest, where brick and fabricated steel structures are seen alongside areas of parking. Views of the WCML and residential development on the northern outskirts of Crewe are largely filtered by intervening vegetation. Views from residential properties are typically filtered by intervening vegetation and outbuildings. Skyline views are comprised of distant wood pole overhead power lines seen above mature tree cover.

5.1.159 At night, close views are unlit with lighting limited to individual properties. Warmingham Road to the south of the viewpoint is well lit by street lighting, with wider skyglow generated by Crewe.

Future environmental baseline

5.1.160 The Planning data report of the main ES (see Volume 5, Appendix: CT-004-00000 of the main ES) provides details of committed developments assumed to have been implemented by 2025. This information has been supplemented by the committed developments listed in the equivalent Volume 5 Planning data report of the SES1 and AP1 ES (see SES1 and AP1 ES Volume 5, Appendix: CT-004-00000). These committed developments have been considered as a future baseline where relevant.

- 5.1.161 None of the identified committed developments will alter the baseline conditions in 2025 or 2038 for landscape or visual amenity.

Effects arising during construction

Avoidance and mitigation measures

- 5.1.162 No mitigation measures additional to those reported in the main ES and draft CoCP are proposed.

Assessment of impacts and effects

Landscape effects

Crewe Fringe Mosslands LCA

- 5.1.163 The main ES reported a high magnitude of change and moderate adverse (significant) effect. This would be due to construction activity associated with Crewe tunnel north portal, Crewe tunnel north portal building, Crewe north portal (retained cutting) and major utility diversion works. During construction, the AP1 revised scheme will not alter the magnitude of change on Crewe Fringe Mosslands LCA. Although the location of Crewe tunnel north and the railway systems compound will be made larger and will be moved to an area north of Parkers Road, the nature of the effects on the parts of the LCA affected by the AP1 revised scheme will be comparable to those described within the main ES. Warmingham Moss satellite compound will be unchanged. The amendment will therefore give rise to a different significant effect for Crewe Fringe Mossland LCA. However, the magnitude of change and a level of significance of the effect will remain as reported in the main ES.

Visual effects

View north-west from Bradfield Road, Crewe (high sensitivity receptors) (303-02-004)

- 5.1.164 The main ES reported a **high** magnitude of change and a **major** adverse (significant) effect for residents on Broughton Road of high susceptibility and with medium value views experiencing a substantial change to the composition of near-distance views. This would be due to the presence of large-scale construction works, including construction of Crewe tunnel north portal and Crewe north portal (retained cutting) and the siting of Crewe tunnel north main compound, visible across the majority of view in the near distance.
- 5.1.165 The amendment will substantially decrease the visual effect at this viewpoint as it will remove construction of Crewe tunnel north portal building and Crewe tunnel north portal from views to the north-west, as a result of their relocation north of Parkers Road. Nevertheless, construction traffic will be perceptible. The amendment will therefore remove a significant effect.

Night-time

- 5.1.166 The main ES reported a **medium** magnitude of change and a **moderate** adverse (significant) effect at night. This would be due to the presence of the Crewe tunnel north main compound and construction activity in relation to Crewe tunnel north portal which would introduce localised new lighting elements into views.
- 5.1.167 The amendment will substantially decrease the visual effect of night-time lighting as a result of the relocation of the Crewe tunnel north main compound to a location north of Parkers Road. However, lighting from construction traffic will remain perceptible. The amendment will therefore remove a significant effect.

View east from Somerley Close, Leighton, Crewe (high sensitivity receptors) (304-02-001)

- 5.1.168 The main ES reported a **medium** magnitude of change and **moderate** adverse (significant) effect for residents and users of Footpath Crewe 13/1 of high susceptibility, both with medium value views, experiencing a noticeable change to the composition of middle-distance views. This would be due to the introduction of large-scale construction works into middle-distance views beyond WCML, including the construction of Crewe tunnel north portal, Crewe north portal cutting (retained cutting), and Crewe tunnel north main compound. The presence of existing mature vegetation along the western boundary of the WCML would filter views.
- 5.1.169 The amendment will substantially reduce the visual effect as a result of the Crewe tunnel north main compound being located in an area immediately north of Parkers Road removing construction activity from middle-distance views, beyond the WCML. Existing vegetation within the area formerly allocated for Crewe tunnel north main compound and some of the existing planting close to Parkers Road will be retained. The amendment will, therefore, remove a significant effect.

View west from Broughton Road, Coppenhall, Crewe (high sensitivity receptors) (304-02-002)

- 5.1.170 The main ES reported a **high** magnitude of change and **major** adverse (significant) effect for residents of high susceptibility and with medium value views experiencing a substantial change to the composition of near distance views. This would be due to the presence of large-scale works including the construction of Crewe tunnel north portal building and Crewe north portal cutting (retained cutting). The Crewe tunnel north main compound and associated construction activities would be visible in the near distance and across the majority of the view.
- 5.1.171 The amendment will reduce visibility of construction works in the middle distance, with the focus of activity located north of Parkers Road. The linear belt of trees and shrubs alongside the railway will be retained, but trees along Parkers Road and forming the far-distance skyline will be removed. The amendment will therefore give rise to a different significant

effect. The magnitude of change will be **medium** and the level of significance of the effect reported in the main ES will reduce to **moderate** adverse (significant).

Night-time

- 5.1.172 The main ES reported a **medium** magnitude of change and a **moderate** adverse (significant) effect at night. This would be due to the presence of lighting associated with Crewe tunnel north main compound.
- 5.1.173 The amendment will reduce the visibility of lighting associated with the compound because the light sources will be located to the north of Parkers Road, further from the viewpoint, and the compound will be less visible. However, skyglow associated with the compound will remain apparent. The amendment will remove a significant effect.

View north-west from The White Lion public house, Coppenhall Moss (high sensitivity receptors) (304-02-003)

- 5.1.174 The main ES reported a **low** magnitude of change and **minor** adverse (non-significant) effect for residents of high susceptibility and with medium value views experiencing changes to the composition of middle and far distance views. This would be due to the presence of upper elements of construction on Coppenhall Moss embankment, and the presence of Warmington Moss satellite compound, which would be visible over existing, intervening field boundary vegetation.
- 5.1.175 The amendment will increase the visual effect at this viewpoint, because the Crewe tunnel north main compound will move closer to the viewpoint and combined with some removal of hedgerows, will be visible immediately beyond Kent's Lane in the near and middle-distance. The amendment will give rise to a **medium** magnitude of change and a **moderate** adverse (significant) effect. The amendment will therefore give rise to a new significant effect.

Night-time

- 5.1.176 The main ES reported a **low** magnitude of change and **minor** adverse (non-significant) effect, at night. This would be due to the presence of lighting for Crewe tunnel north main compound and Warmingham Moss satellite compound.
- 5.1.177 The amendment will increase the visual effect at this viewpoint because the Crewe tunnel north main compound and associated light sources will move closer to the viewpoint. The amendment will give rise to a **medium** magnitude of change and a **moderate** adverse (significant) effect. The amendment will therefore give rise to a new significant effect.

View east from Bleasdale Road, Leighton, Crewe (medium-high sensitivity receptors) (304-02-004)

- 5.1.178 The main ES reported a **medium** magnitude of change and **moderate** adverse (significant) effect for residents on Bleasdale Road and between Parkers Road and Thornfields and footpath users of Crewe Footpath 12/2 and 12/1 of high susceptibility, with medium value

views experiencing a noticeable change to the composition of near and middle-distance views. This would be due to the presence of construction activity associated with Coppenhall Moss cutting, Warmingham Moss northbound WCML embankment, Coppenhall Moss north embankment, Footpath Crewe 29/1 accommodation overbridge and works to the existing Parkers Road Overbridge.

- 5.1.179 The amendment will increase the visual effect at this viewpoint as a result of additional vegetation clearance west of the WCML in the near distance which will open up views of the Crewe tunnel north main compound immediately beyond the WCML. The amendment will, therefore, give rise to a different significant effect. The magnitude of change will be **high** and the level of significance of the effect reported in the main ES will increase to **major** adverse (significant).

Night-time

- 5.1.180 The main ES reported a **low** magnitude of change and a **minor** adverse (non-significant) effect at night. This would be due to the presence of Crewe tunnel north main compound, which would introduce localised lighting elements visible above existing intervening vegetation and WCML.
- 5.1.181 The amendment will increase the night-time effect because the compound will be moved north of Parkers Road and lighting will be brought closer to the viewpoint, into near and middle-distance views. The amendment will, therefore, give rise to a **medium** magnitude of change and a **moderate** adverse (significant) effect. The amendment will therefore give rise to a new significant effect.

View west from Footpath Crewe 28/1 (Crewe and Nantwich Circular Walk), Coppenhall Moss (high sensitivity receptors) (304-03-005)

- 5.1.182 The main ES reported a **major** adverse (significant) effect for users of Footpaths Crewe 28/1, 29/1 and 30/1 of high susceptibility and with medium value views experiencing a substantial change to the composition of near and middle-distance views. This would be due to the presence of large-scale construction works which, would be widely visible across the skyline. This would include the construction of Footpath Crewe 29/1 accommodation overbridge, Warmingham Moss southbound viaduct and Warmingham Moss northbound viaduct, Coppenhall Moss north embankment, Warmingham Moss southbound embankments 1 and 2.
- 5.1.183 The amendment will change the visual effect at this viewpoint, because additional construction activity and the presence of the Crewe tunnel north main compound in a location to the north of Parkers Road will be closer in the view for footpath users. The amendment will, therefore, give rise to a different significant effect; however, the level of significance of the effect will remain as reported in the main ES.

View south-west from Maplins Moss Place, Coppenhall, Crewe (high sensitivity receptors) (304-02-010)

- 5.1.184 The main ES reported a **high** magnitude of change and a **major** adverse (significant) effect for residents of high susceptibility and with medium value views experiencing a substantial change to the composition of near distance views. This would be due to the presence of large-scale construction works, including the construction of Crewe tunnel north portal building and Crewe north portal cutting (retained cutting), which would be visible in the near distance and across the majority of the view.
- 5.1.185 The amendment will substantially decrease the visual effects at this viewpoint. This is because the construction of Crewe tunnel north portal building, Crewe tunnel north portal and Crewe north portal cutting (retained cutting) will be moved to an area north of Parkers Road, with construction activity associated with the Crewe tunnel main compound removed from near distance views. Some construction works associated with the establishment of ecological mitigation measures will remain partially visible in views west, heavily filtered by existing intervening vegetation. The amendment will, therefore, remove a significant effect.

Night-time

- 5.1.186 The main ES reported a **medium** magnitude of change and a **moderate** adverse (significant) effect, at night. This would be due to the presence of night-time lighting for Crewe tunnel north main compound and construction activity in relation to Crewe tunnel north portal and portal building, which would introduce new lighting elements into views.
- 5.1.187 The amendment will decrease the visual effect at this viewpoint because the lighting associated with Crewe tunnel north main compound will be moved to an area north of Parkers Road and further from the viewpoint. The amendment will therefore remove a significant effect.

View north-east from Parkers Road (high sensitivity receptors) (304-03-012)

- 5.1.188 This new viewpoint is located in an area where there will be changes from the original scheme. Users of Footpath Crewe 12/2 and Parkers Road of **high** susceptibility and with **medium** value views will experience a substantial change to the composition of near and middle-distance views as a result of the amendment. Vegetation clearance in the near distance will increase views of the adjacent housing and of the WCML to the north. The demolition of buildings at Moss Bridge Farm (Winton Equestrian Centre) and the removal of associated mature vegetation will be noticeable in the view beyond the WCML. The presence of large-scale construction activity associated with Crewe tunnel north main compound, railway systems compound and construction of Crewe tunnel north portal building, Crewe tunnel north portal, associated rescue areas and car parking, will be visible in the near and middle-distance. The existing WCML, and construction activity associated with the construction of Footpath Crewe 29/1 accommodation overbridge, Warmingham Moss southbound embankment No.1a and Warmingham Moss southbound WCML embankment will be visible within views to the north. The amendment will give rise to a **high** magnitude of

change and a **major** adverse (significant) effect. The amendment will therefore give rise to a new significant effect.

- 5.1.189 A photomontage illustrating this scenario from a representative viewpoint 304-03-012 is included in the SES1 and AP1 ES, Volume 5, Appendix: LV-001-0MA01, Part 4.

View west from Kent's Lane (medium sensitivity receptors) (304-03-013)

- 5.1.190 This new viewpoint is located in an area where there will be changes from the original scheme. Users of Kent's Lane and residents of **high** susceptibility and with **medium** value views will experience a substantial change to near and middle-distance views as a result of the amendment. This will include the presence of large-scale construction activity at the Crewe tunnel north main compound, railway systems compound and construction of the Crewe tunnel north portal building, Crewe tunnel north portal, rescue areas and car parking. The buildings and mature vegetation within Moss Bridge Farm (Winton Equestrian Centre) will be removed. Hedgerows along Kent's Lane will be removed to facilitate utilities works as part of the amendment. Structures and activity within the construction compound and railway systems compound including plant movements, temporary buildings and ancillary structures will be prominent elements within direct views. Views to the north will include temporary stockpiles of materials. Construction activity as part of the original scheme for Footpath Crewe 29/1 accommodation overbridge, Coppenhall Moss embankment and Warmingham Moss embankments will be visible in the middle and far distance of the view. The amendment will give rise to a **high** magnitude of change and a **major** adverse (significant) effect. The amendment will therefore give rise to a new significant effect.

Night-time

- 5.1.191 The presence of night-time lighting for Crewe tunnel north main compound will introduce localised lighting elements into near and middle-distance views. Lighting within Warmingham Moss satellite compound to the north will contribute to the visibility of skyglow in the distance. The controls on light spill set out in the draft CoCP will limit the change these new light sources introduce to the wider view. However, there will be an increase in the prominence of artificial lighting in the view for properties along Kent's Lane. At night there will be a **high** magnitude of visual change and a **major** adverse (significant) effect. The amendment will therefore give rise to a new significant effect.
- 5.1.192 For further information, see SES1 and AP1 ES, Volume 5, Appendix: LV-001-0MA01.

Other mitigation measures

- 5.1.193 No mitigation measures additional to those reported in the main ES and draft CoCP are proposed.

Summary of likely residual significant effects

- 5.1.194 In many cases, significant effects will reduce over time as the proposed mitigation planting matures and reaches its designed intention. The amendment will give rise to a different

likely residual significant construction effect after implementation of construction phase mitigation, for the Crewe Fringe Mosslands LCA, but the level of effect will be unchanged to that reported in the main ES. The level of significance of the effect will remain **moderate** adverse (significant).

- 5.1.195 The amendment will give rise to a different likely residual significant construction effect after implementation of construction phase mitigation, at the following viewpoints:
- view east from Bleasdale Road and north from Thornfields, Leighton, Crewe (304-02-004) - the effect will increase to **major** adverse (significant); and
 - view west from Broughton Road, Coppenhall, Crewe (304-02-002) - the effect will reduce to **moderate** adverse (significant).
- 5.1.196 The amendment will give rise to a new likely residual significant construction effect after implementation of construction phase mitigation, at the following viewpoint: view north-west from the White Lion Public House, Coppenhall Moss (304-02-003) - the effect will increase to **moderate** adverse (significant).
- 5.1.197 The amendment will give rise to a new likely residual significant construction effect, after implementation of construction phase mitigation, at the following new viewpoints which have been selected as the amendment has the potential to result in new or different effects:
- view north-east from Parkers Road (304-03-012) - the effect will be **major** adverse, (significant); and
 - view west from Footpath Crewe 30/1, Kent's Lane (304-03-013) - the effect will be **major** adverse (significant).
- 5.1.198 The amendment will give rise to a different likely residual significant construction effect, after implementation of construction phase mitigation, at viewpoint: view west from Footpath Crewe 28/1 (Crewe and Nantwich Circular Walk), Coppenhall Moss (304-03-005) but the level of effect will be unchanged to that reported in the main ES. The effect will increase but will remain **major** adverse significant.
- 5.1.199 The amendment will give rise to a new likely residual significant construction night-time effect after implementation of construction phase mitigation, at the following viewpoints:
- view north-west from The White Lion public house, Coppenhall Moss (304-02-003) - the effect will increase to **moderate** adverse (significant);
 - view east from Bleasdale Road and north from Thornfields, Leighton, Crewe (304-02-004) - the effect will be **moderate** adverse (significant); and
 - view west from Footpath Crewe 30/1, Kent's Lane (304-03-013) – the effect will be **major** adverse (significant).

Cumulative effects

- 5.1.200 No new, removed or different significant cumulative effects have been identified compared to the main ES.

Effects arising during operation

Avoidance and mitigation measures

- 5.1.201 No mitigation measures additional to those reported in the main ES are proposed.

Assessment of impacts and effects

Visual assessment

View north from public open space bordering the B5076 Middlewich Street (medium-high sensitivity receptors) (303-02-001) and view south-east from public open space bordering the B5076 Middlewich Street (medium-high sensitivity receptors) (303-02-003)

- 5.1.202 At year 1, the main ES reported a **moderate** adverse (significant) effect for residents and users of the public open space of high susceptibility and railway users of lower susceptibility, all with medium value views experiencing a noticeable change to the composition of near-distance views. This would be due to the presence of Middlewich Street vent shaft and headhouse, together with the re-instatement of grass, tree and shrub planting, which would help integrate the building into the urban fabric and define pedestrian circulation routes.
- 5.1.203 At year 1, the amendment will change the visual effect at this viewpoint, because the height of Middlewich Street vent shaft headhouse will reduce but the building footprint and overall size of the site will increase. An additional above ground building will be introduced, and the surrounding area will be reinstated with grass. The headhouse design will change from circular to a rectangular building. The amendment will result in a noticeable change to the composition of the view. The amendment will therefore give rise to a different significant effect; however, the level of significance of the effect will remain as reported in the main ES.
- 5.1.204 A photomontage illustrating this scenario from representative viewpoint 303-02-003 is included in the SES1 and AP1 ES Landscape and visual Map Book.
- 5.1.205 At year 15, the main ES reported a **moderate** adverse (significant) effect due to the growth of mitigation planting, which would provide visual screening and integration of Middlewich Street vent shaft headhouse into views.
- 5.1.206 At year 15, the amendment will change the visual effect at this viewpoint. The headhouse will be lower in height, reducing its prominence on the skyline. The area of mitigation planting will be narrower and therefore less effective as a visual screen. The amendment will result in a noticeable change to the composition of the view and will therefore give rise to a different significant effect. However, the level of significance of the effect will remain as reported in the main ES.
- 5.1.207 At year 30, the level of significance of the effect will remain non-significant as reported in the main ES due to the growth of mitigation planting and increase in effective screening.

**View north-west from Bradfield Road, Crewe (high sensitivity receptors)
(303-02-004)**

- 5.1.208 At year 1 the main ES reported a **medium** magnitude of change and a moderate adverse (significant) effect for residents of high susceptibility and with medium value views experiencing a noticeable change to the composition of near-distance views. This would be due to the presence of Crewe north portal cutting (retained cutting), Crewe tunnel north portal building and rescue area and Crewe tunnel portal auto-transformer station.
- 5.1.209 At year 1, the amendment will substantially decrease the visual effect as a result of the relocation of Crewe tunnel north portal building and Crewe tunnel north portal to a location north of Parkers Road and will not be visible from this viewpoint. The amendment will therefore remove a significant effect at years 1, 15 and 30.

View north-west from the White Lion public house, Coppenhall Moss) (high sensitivity receptors) (304-02-003)

- 5.1.210 At year 1, the main ES reported a **low** magnitude of change and a **minor** adverse (non-significant) effect for residents of high susceptibility and with medium value views experiencing changes to the composition of middle and far distance views. This would be due to the presence of additional infrastructure elements including overhead line equipment and train movements along a section of Coppenhall Moss embankment in the middle and far distance, partly filtered by intervening vegetation.
- 5.1.211 At year 1, the amendment will increase the visual effect at this viewpoint, because Crewe tunnel north portal building will be visible in the middle distance and overhead line equipment and train movements will be slightly more visible in views to the west, as a result of the loss of vegetation during construction. Mitigation planting will not be sufficiently mature to provide any screening or visual integration of these elements in year 1. The amendment will give rise to a **medium** magnitude of change and a **moderate** adverse (significant) effect. The amendment will therefore give rise to a new significant effect.
- 5.1.212 At year 15 and 30, the level of significance of the effect will remain non-significant as reported in the main ES due to the growth of mitigation planting and increase in effective screening.

**View east from Bleasdale Road, Leighton, Crewe (high sensitivity receptors)
(304-02-004)**

- 5.1.213 At year 1, the main ES reported a **low** magnitude of change and a **minor** adverse (non-significant) effect for residents on Bleasdale Road and between Parkers Road and Thornfields and footpath users of Crewe Footpath 12/2 and 12/1 of high susceptibility, with medium value views experiencing a noticeable change to the composition of near and middle-distance views. This would be due to the presence of Coppenhall Moss cutting, Warmingham Moss northbound and southbound spurs and Footpath Crewe 29/1 accommodation overbridge in the near and middle distance, partly filtered by intervening vegetation.

- 5.1.214 At year 1, the amendment will increase the visual effect at this viewpoint, because the loss of near distance vegetation during construction will open up views of Crewe tunnel north portal, building, rescue area and car parking, the existing Parkers Road Overbridge and Footpath Crewe 29/1 accommodation overbridge in the middle-distance. Train movements and overhead line equipment associated with the amendment will be partially screened by Coppenhall Moss cutting. The amendment will give rise to a **medium** magnitude of change and a **moderate** adverse (significant) effect. The amendment will therefore give rise to a new significant effect.
- 5.1.215 At year 15 and or 30, the level of significance of the effect will remain non-significant as reported in the main ES due to the growth of mitigation planting and increase in effective screening.

View south-west from Maplins Moss Place, Coppenhall, Crewe (high sensitivity receptors) (304-02-010)

- 5.1.216 At year 1, the main ES reported a **medium** magnitude of change and a **moderate** adverse (significant) effect for residents of **high** susceptibility and with **medium** value views experiencing a substantial change to the composition of middle-distance views. This would be due to the presence of Crewe north portal cutting (retained cutting), which would be visible in the near distance to the west and Crewe tunnel north portal building in the middle distance to the south within views.
- 5.1.217 At year 1, the amendment will decrease the visual effect at this viewpoint, because Crewe tunnel north portal, building, associated rescue area and car park, and Crewe north portal cutting (retained cutting) will be relocated to an area north of Parkers Road and will no longer be in the direct line of view. Existing boundary vegetation retained in construction will partially filter views towards the WCML. The amendment will therefore remove a significant effect.
- 5.1.218 At year 15 and 30, the level of significance of the effect will remain non-significant as reported in the main ES due to the growth of mitigation planting and increase in effective screening.

View north-east from Parkers Road (high sensitivity receptors) (304-03-012)

- 5.1.219 This new viewpoint is located in an area where there will be changes from the original scheme. At year 1, users of Footpath Crewe 12/2 and Parkers Road of **high** susceptibility and with **medium** value views will experience a substantial change to the composition of near and middle-distance views as a result of the amendment. Vegetation removed during construction will open up views to the east of the WCML. Crewe tunnel north portal building, rescue area and car parking will be prominent in the near distance, beyond which and to the north will be the Crewe tunnel north portal, overhead line equipment and train movements running parallel with the WCML. Footpath Crewe 29/1 accommodation overbridge, Warmingham Moss southbound embankment no. 1a, Warmingham Moss southbound WCML embankment will be visible within views to the north. Mitigation planting around the buildings and car park will be visible but will not have a screening effect, due to its

immaturity. The amendment will give rise to a **high** magnitude of change and a new **major** adverse (significant) effect. The amendment will therefore give rise to a new significant effect.

- 5.1.220 A photomontage illustrating this scenario from a representative viewpoint 304-03-012 is included in the SES1 and AP1 ES, Volume 5, Appendix: LV-001-0MA01, Part 4.
- 5.1.221 At year 15, views of the amendment will remain noticeable in the near and middle distance, beyond the WCML. Establishing replacement vegetation adjacent to the WCML and mitigation planting around Crewe tunnel north portal will partially screen Crewe tunnel north portal building. Footpath Crewe 29/1 accommodation overbridge, Warmingham Moss southbound embankment No. 1a and Warmingham Moss southbound WCML embankment will remain visible in the far distance to the north. Overhead line equipment and train movements will be visible running parallel with the existing WCML. The amendment will give rise to a **high** magnitude of change and a new **major** adverse (significant) effect. The amendment will therefore give rise to a new significant effect.
- 5.1.222 At year 30, further establishment of mitigation planting around Crewe tunnel north portal will partially screen Crewe tunnel north portal building. However, the amendment will remain visible in the middle to far-distance, viewed in the context of the WCML. Footpath Crewe 29/1 accommodation overbridge will reduce awareness of the Crewe tunnel north portal and of Warmingham Moss southbound embankment No.1a and Warmingham Moss southbound WCML embankment beyond. The amendment will give rise to a **medium** magnitude of change and a new **moderate** adverse (significant) effect. The amendment will therefore give rise to a new significant effect.

View west from Footpath Crewe 30/1, Kent's Lane (medium sensitivity receptors) (304-03-013)

- 5.1.223 This new viewpoint is located in an area where there will be changes from the original scheme. At year 1, residents and users of Kent's Lane of **high** susceptibility, all with **medium** value views, will experience a substantial change to the composition of middle-distance views as a result of the amendment. The absence of intervening hedgerows and vegetation adjacent to the WCML, removed during construction, will open up views to the west, and views of housing on the edge of Leighton, although the presence of existing built elements will partially screen views from residential properties. The amendment will be visible in front of the WCML, as will overhead line equipment and trains as they enter and emerge from the Crewe tunnel. Footpath Crewe 29/1 accommodation overbridge, Coppenhall Moss embankment and Warmingham Moss southbound embankments will be visible to the north. Mitigation planting around the buildings at Crewe tunnel north portal, auto-transformer station and Parkers Road and hedgerow planting will not contribute towards screening due to its immaturity at year 1. The amendment will give rise to a **high** magnitude of change and a **major** adverse (significant) effect. The amendment will therefore give rise to a new significant effect.

- 5.1.224 At year 15, although still noticeable in the view, establishing mitigation planting in the near and middle-distance will filter and partially screen views of the amendment including the Crewe tunnel north portal building and auto transformer station as well as the overhead line equipment and train movements in the middle-distance. The amendment will give rise to a **medium** magnitude of change and a **moderate** adverse (significant) effect. The amendment will therefore give rise to a new significant effect.
- 5.1.225 At year 30, the level of significance of the effect will remain non-significant as reported in the main ES due to the growth of mitigation planting and increase in effective screening.
- 5.1.226 For further information see the SES1 and AP1 ES, Volume 5, Appendix: LV-001-0MA01.

Other mitigation measures

- 5.1.227 No mitigation measures additional to those reported in the main ES are proposed.

Summary of likely residual significant effects

- 5.1.228 In many cases, significant effects will reduce over time as the proposed mitigation planting matures and reaches its designed intention. However, the amendment will give rise to a different likely residual significant operational effect, at the following viewpoints at year 15 operation, but where the level of effect will be unchanged to that reported in the main ES:
- view north from public open space bordering the B5076 Middlewich (303-02-001) - the effect will remain **moderate** adverse (significant); and
 - view south-east from public open space bordering the B5076 Middlewich Street (303-02-003) - the effect will remain **moderate** adverse (significant).
- 5.1.229 In many cases, significant effects will reduce over time as the proposed mitigation planting matures and reaches its designed intention. However, the amendment will give rise to a new likely residual significant operational visual effect at the following viewpoints, at year 15 operation:
- view north-east from Parkers Road (304-03-012) – the effect will be **major** adverse (significant); and
 - view west from Footpath Crewe 30/1, Kent's Lane (304-03-013) – the effects will be **moderate** adverse (significant).

Cumulative effects

- 5.1.230 No new, removed or different significant cumulative effects have been identified compared to the main ES.

Socio-economics

Scope, assumptions and limitations

- 5.1.231 The assessment scope, key assumptions and limitations for socio-economics are as set out in Volume 1 and the SMR of the main ES. This amendment has the potential to result in new or different construction effects only. Therefore, there is no operational assessment for socio-economics.

Environmental baseline

Existing environmental baseline

- 5.1.232 The baseline socio-economics information is as described in Section 12 of Volume 2, Community Area report: Hough to Walley's Green (MA01) of the main ES.

Future environmental baseline

- 5.1.233 The Planning data of the main ES (see Volume 5, Appendix: CT-004-00000 of the main ES) provides details of committed developments assumed to have been implemented by 2025. This information has been supplemented by the committed developments listed in the equivalent Volume 5 Planning data report of the SES1 and AP1 ES (see SES1 and AP1 ES Volume 5, Appendix: CT-004-00000). These committed developments have been considered as a future baseline where relevant. No committed developments of relevance for the socio-economic assessment have been identified that would materially alter the future baseline in this area.

Effects arising during construction

Avoidance and mitigation measures

- 5.1.234 No mitigation measures additional to those reported in the main ES and draft CoCP are required.

Assessment of impacts and effects

- 5.1.235 The main ES reported that the construction works would require the closure of Parkers Road between Broughton Road and Bleasdale Road to vehicular traffic, which would result in a temporary moderate adverse significant isolation effect on The White Lion public house.
- 5.1.236 Retaining the existing Parkers Road Overbridge as part of the amendment means that the previously described diversion will no longer be required, since the road will remain open for customers arriving by vehicle from Coppenhall, north Crewe. As a result, the significant isolation effect on The White Lion Public house will no longer occur.

- 5.1.237 As a result of the amendment, during construction The White Lion public house in north Crewe will experience new significant visual effects, as well as significant effects from HGV construction traffic (traffic-related severance for non-motorised users) that were identified as part of the original scheme. The sensitivity of this establishment is assessed to be high as customers are considered to be sensitive to impacts on the local environment and setting. The construction works may discourage them from using this facility. Given the duration of effects and the high level of sensitivity, the amendment is assessed to have a significant adverse in-combination effect on this business.

Other mitigation measures

- 5.1.238 No mitigation measures additional to those reported in the main ES and draft CoCP are required. The main ES reported that the nominated undertaker will seek to deliver appropriate signage to inform users of the continued operation of The White Lion public house. As a result of the amendment, there is no longer a significant isolation effect on the White Lion public house, so this mitigation measure is no longer required.

Summary of likely residual significant effects

- 5.1.239 The amendment will result in The White Lion public house no longer being subject to an adverse residual significant isolation effect. However, The White Lion public house will now be subject to a new adverse residual significant in-combination effect.

Cumulative effects

- 5.1.240 No new, removed or different significant cumulative effects have been identified compared to the main ES.

Sound, noise and vibration

Scope, assumptions and limitations

- 5.1.241 The assessment scope, key assumptions and limitations for sound, noise and vibration are as set out in Volume 1 and the SMR of the main ES.
- 5.1.242 This amendment has the potential to result in new or different likely significant construction and operational effects for sound, noise and vibration.
- 5.1.243 Sound, noise and vibration effects that result from the assessment of the changes to traffic flows as a result of all AP1 amendments in combination with all SES1 changes are reported in Section 7.

Environmental baseline

Existing environmental baseline

- 5.1.244 In the Hough to Walley's Green area, the updated sound modelling described in Section 2 has resulted in updates to the existing baseline sound levels at receptors adjacent to Broughton Road and in the community of Coppenhall. Further information on the updated baseline sound levels relevant to the assessment is provided in the SES1 and AP1 ES Volume 5, Appendix: SV-002-00000. Where no updates to the baseline sound levels are required, the baseline sound, noise and vibration information is as described in Section 13 of Volume 2, Community Area report: Hough to Walley's Green area (MA01) of the main ES.
- 5.1.245 Baseline sound levels representative of the assessment locations affected by this amendment have been used in both the construction and operational airborne noise assessments.

Future environmental baseline

- 5.1.246 The Planning data report of the main ES (see Volume 5, Appendix: CT-004-00000 of the main ES) provides details of committed developments assumed to have been implemented by 2025. This information has been supplemented by the committed developments listed in the equivalent Volume 5 Planning data report of the SES1 and AP1 ES (see SES1 and AP1 ES Volume 5, Appendix: CT-004-00000). These committed developments have been considered as a future baseline where relevant.
- 5.1.247 The developments have been considered to determine whether they would result in a material change to the future baseline or have the potential to give rise to cumulative effects. None of the identified developments affect the assessment of sound, noise and vibration from the amendment.
- 5.1.248 Updates have also been made to future baseline sound levels at the locations identified in the existing baseline section above where updates to the existing baseline sound levels have been made for the SES1 and AP1 ES.

Effects arising during construction

Avoidance and mitigation measures

- 5.1.249 In addition to the avoidance or mitigation measures reported in the main ES and draft CoCP¹, taller screening (provided by solid temporary hoarding, temporary stockpiles, screening close to activities or other means to provide equivalent noise reductions) has been assumed at Crewe tunnel north main compound near Coppenhall (south-facing and east-facing boundaries of the construction compound).

Assessment of impacts and effects

Residential receptors: direct effects – communities

- 5.1.250 The amendment has the potential to give rise to new and different temporary direct adverse noise effects which may be considered to be significant on a community basis. The potential new or different likely significant effects are discussed in the following paragraphs and summarised in Table 9. In the table, the duration of impact is the period where the relevant assessment category is exceeded. The predicted monthly construction noise level will vary throughout this period and as a guide the typical and highest monthly noise levels at the closest dwellings in the community identified are presented in the 'cause' column of this table.
- 5.1.251 The main ES, as updated by the SES1, identified a likely significant effect as a result of construction noise and vibration at approximately 230 dwellings in the vicinity of Broughton Road at Coppenhall. Approximately 15 of these dwellings were also predicted to experience an impact from off-site construction traffic activities. This was denoted as MA01-C-C2 in Table 2 of the SES1. The amendment will result in the removal of this likely significant effect on 230 dwellings for construction noise and vibration.
- 5.1.252 The main ES identified a likely significant effect as a result of construction noise at approximately 45 dwellings in the vicinity of Wareham Drive at Crewe (north). This was denoted as MA01-C-C3 in Table 45 of the Volume 2, Community Area report: Hough to Walley's Green (MA01), in Volume 5, Appendix: SV-002-0MA01 and in the Volume 5, Sound, noise and vibration Map Book, Map Series SV-03 of the main ES. The amendment will result in the removal of this likely significant effect on 45 dwellings.
- 5.1.253 The amendment will give rise to a new adverse noise effect at approximately 10 dwellings in the vicinity of Warmingham Road at Coppenhall Moss (MA01-C-C10). The predicted duration of the construction noise impact is up to two years and five months during the night-time. This may be considered by the local community as an effect on the acoustic character of the area and hence be perceived as a change in the quality of life for that community. This is considered to be a new likely significant effect when assessed on a community basis.

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Table 9: Direct adverse construction effects on residential communities and shared open areas that are considered to be significant on a community basis and are new or removed to those reported in the main ES

Significant effect number (and map reference) ¹⁷	Type of significant effect	Time of day	Location	Cause (construction activities) ¹⁸	Assumed approximate duration of impact
MA01-C-C2 (SV-03-303)	Construction noise and vibration and traffic noise (Removed)	Not applicable	Coppenhall: approximately 230 dwellings in the vicinity of Broughton Road.	Not applicable	Not applicable
MA01-C-C3 (SV-03-303)	Construction noise (Removed)	Not applicable	Crewe (north): approximately 45 dwellings in the vicinity of Wareham Drive.	Not applicable	Not applicable
MA01-C-C10 (SV-03-303)	Construction noise (New)	Night-time	Coppenhall Moss: approximately 10 dwellings in the vicinity of Warmingham Road.	During the night-time, general site works and bored tunnel works in the vicinity of Crewe tunnel north portal. The typical and highest monthly noise levels will both be approximately 45dB to 55dB ¹⁹ .	Noise for up to two years and five months during the night-time.

¹⁷ See SES1 and AP1 Volume 5, Appendix: SV-002-00000, Sound, noise and vibration report (MA01) and Volume 5, Sound, noise and vibration Map Book: Map Series SV-03.

¹⁸ The construction activity giving rise to the highest predicted noise or vibration level is reported. Multiple construction activities may contribute to the typical noise levels and the approximate duration of impact.

¹⁹ Equivalent continuous sound level at the facade, $L_{pAeq, 2300-0700}$.

5.1.254 For further information see SES1 and AP1 ES Volume 5, Appendix: SV-002-00000 and SES1 and AP1 ES Volume 5: Sound, noise and vibration Map Book.

Non-residential receptors: direct effects

5.1.255 The amendment will give rise to different likely significant direct construction effects on the following non-residential receptors where the predicted airborne sound levels exceed both the relevant screening criteria and the noise change criterion (typically a change of greater than 3dB²⁰ compared with the existing baseline sound level):

- Cemetery Lodge (offices), Market Close, Crewe (assessment location ref.: 610740);
- Orbitas Bereavement Services (offices), Market Close, Crewe (assessment location ref.: 610041); and
- Crewe Cemetery and Crematorium (place of worship), Market Close, Crewe (assessment location ref.: 610532).

5.1.256 These locations are identified in the Hough to Walley's Green area, as shown in Volume 5, Sound, noise and vibration Map Book, Map Series SV-03 of the main ES.

5.1.257 The main ES identified a significant effect as a result of construction noise at Cemetery Lodge. This was denoted as MA01-C-N5 in the Volume 2, Community Area report: Hough to Walley's Green (MA01), in Volume 5, Appendix: SV-002-0MA01 and the Volume 5, Sound, noise and vibration Map Book, Map Series SV-03 of the main ES. The amendment will decrease the duration of the impact from 10 months to two months. This will give rise to a different likely significant effect at Cemetery Lodge.

5.1.258 The main ES identified a significant effect as a result of construction noise at Orbitas Bereavement Services. This was denoted as MA01-C-N6 in the Volume 2, Community Area report: Hough to Walley's Green (MA01), in Volume 5, Appendix: SV-002-0MA01 and the Volume 5, Sound, noise and vibration Map Book, Map Series SV-03 of the main ES. The amendment will decrease the duration of the impact from two years and 11 months to eight months. This will give rise to a different likely significant effect at Orbitas Bereavement Services.

5.1.259 The main ES identified a significant effect as a result of construction noise at Crewe Cemetery and Crematorium. This was denoted as MA01-C-N7 in the Volume 2, Community Area report: Hough to Walley's Green (MA01), in Volume 5, Appendix: SV-002-0MA01 and the Volume 5, Sound, noise and vibration Map Book, Map Series SV-03 of the main ES. The amendment will decrease the duration of the impact from seven months to two months. This will give rise to a different likely significant effect at Crewe Cemetery and Crematorium.

²⁰ The exception is where the use and sensitivity of the receptor or land use is very sensitive to noise and have been included in the detailed assessment where there is a change less than 3dB. Further information can be found in Volume 5, Appendix: SV-002-00000.

Other mitigation measures

- 5.1.260 No mitigation measures, additional to those reported in the main ES and draft CoCP, are identified.

Summary of likely residual significant effects

- 5.1.261 The amendment will result in the removal of the likely temporary residual adverse significant construction noise effect on the residential communities of Coppenhall and Crewe north.
- 5.1.262 The amendment will give rise to a new likely temporary residual adverse significant construction noise effect on the residential community of Coppenhall Moss.
- 5.1.263 Noise from specific construction activities has been identified as resulting in different likely temporary residual adverse significant effects on the non-residential buildings at:
- Cemetery Lodge, Market Close;
 - Orbitas Bereavement Services, Market Close; and
 - Crewe Cemetery and Crematorium, Market Close.

Cumulative effects

- 5.1.264 No new, removed or different significant cumulative effects have been identified compared to the main ES.

Effects arising during operation

Avoidance and mitigation measures

- 5.1.265 In the main ES a noise fence barrier was to be provided, along the western side of the route of the original scheme, from the existing Parkers Road Overbridge to Coppenhall Moss north embankment. This has been reduced from 1.3km in length and up to 5m in height to 880m in length and 3m in height. Otherwise, the avoidance and mitigation measures are as set out in Volume 2, Community Area report: Hough to Walley's Green (MA01) of the main ES.

Assessment of impacts and effects

Residential receptors: direct effects – individual dwellings

Ground-borne noise and vibration

- 5.1.266 HS2's policy with respect to control of ground-borne noise and vibration is set out in information paper E10²¹ for the original scheme; similar provisions will apply to the AP1 revised scheme. The nominated undertaker will take all reasonably practicable steps to

²¹ HS2 Limited Information Paper E10 (2022), *Control of Ground-Borne Noise and Vibration from the Operation of Temporary and Permanent Railways*.

construct, operate and maintain the AP1 revised scheme so that the level of ground-borne noise and vibration predicted in all reasonably foreseeable circumstances does not exceed the Significant Observed Adverse Effect Levels (SOAEL) identified in the SMR.

- 5.1.267 The main ES identified 35 residential dwellings above Crewe tunnel where ground-borne noise has the potential to exceed the relevant Significant Observed Adverse Effect Levels (SOAEL). The amendment will reduce the ground-borne noise level at these dwellings to below the relevant SOAEL, so these likely significant adverse effects are removed.
- 5.1.268 Bridge Farm, Parkers Road, Crewe (assessment location ref.: 610103), which was due to be demolished in the original scheme, is now to be retained due to the amendment (see Table 4) and the ground-borne noise from Crewe tunnel has the potential to exceed the relevant SOAEL. In the absence of proposed mitigation to control the ground-borne noise levels within this property to a level below SOAEL, a new likely significant adverse effect on an individual property basis has been identified and is shown on Map Series SV-02 (SES1 and AP1 ES Volume 5, Sound, noise and vibration Map Book).
- 5.1.269 On the basis of a reasonable worst-case assumption and given that at this stage no practicable mitigation has been identified to control the ground-borne noise levels within this property to a level below SOAEL, on an individual property basis there may be a significant adverse effect on the health and quality of life of the occupants. HS2 Ltd will continue to seek reasonably practicable measures to further reduce or avoid these significant effects.

Residential receptors: direct effects – communities

- 5.1.270 The amendment will give rise to different adverse ground-borne noise and vibration and beneficial airborne noise effects, which are considered to be significant on a community basis and are presented in Table 10 and Table 11 respectively.
- 5.1.271 The main ES, as updated by the SES1, identified a likely significant adverse operational ground-borne noise and vibration effect in the vicinity of approximately 285 dwellings at Crewe (MA01-O-C1). The amendment will reduce ground-borne noise levels in several of these dwellings through lowering of the tunnel alignment, though the increase in the length of Crewe tunnel will introduce ground-borne noise and vibration impacts at approximately 30 additional dwellings. This will reduce the number of dwellings affected at this community to approximately 275 dwellings; reduce the ground-borne noise impact classification at the most affected dwellings from high to medium; and reduce the vibration impact classification at the most affected dwellings from moderate to minor, both of which given the number of dwellings are still significant. This amendment will give rise to a different likely significant adverse operational ground-borne noise and vibration effect on the residential community.

Table 10: Direct adverse operational effects on residential communities and shared open areas that are considered significant on a community basis and are different to those reported in the main ES

Significant effect number and map reference ²²	Source of significant effect	Time of day	Location and details
MA01-O-C1 (SV-05-302)	Ground-borne noise and vibration increase from new train services (Different)	Daytime and night-time	Crewe Approximately 275 dwellings ²³ in the vicinity of Earle Street, Brierley Street, Broughton Road, North Street, Thomas Street, Wallis Street, Henry Street, Middlewich Street, Ridgway Street, Audley Street, Sheppard Close, Broad Street, Cranborne Road, Greenacres, Crossway, Lime Street, Haslemere Way, Broad Street, Hazel Grove, Churchmere Drive, Chapelmere Court, Maplins Moss Place, Roedean Walk, Weston Lane and Britannia Close. Forecast ground-borne noise and vibration from the railway is likely to cause an adverse effect on the acoustic character within the dwellings as a result of: <ul style="list-style-type: none"> • low ground-borne noise impacts at approximately 135 dwellings; and • medium ground-borne noise and minor vibration impacts at approximately 140 dwellings.

5.1.272 The main ES identified a likely significant beneficial effect related to airborne noise during operation due to decreases in sound from railways (including reduction in noise from the existing WCML) in the vicinity of approximately 75 dwellings at Leighton, Crewe (MA01-O-C2). The amendment will reduce noise levels further at dwellings in this community so will increase the number of dwellings beneficially affected to approximately 145 dwellings. This will give rise to a different likely significant beneficial operational noise effect on the residential community.

Table 11: Direct beneficial effects on residential communities and shared open areas considered significant on a community basis and are different to those reported in the main ES

Significant effect number and map reference ²⁴	Source of significant effect (type)	Time of day	Location and details
MA01-O-C2 (SV-05-303)	Airborne noise decrease from new train services (Different)	Daytime and night-time	Leighton, Crewe Approximately 145 dwellings in the vicinity of Bowland Croft, Wharfdale Avenue, Hawswater Avenue, Buttermere Drive, Bleasdale Road, Aysgarth Avenue and Perry Fields. Forecast decreases in sound from railways (including reduction in noise from the existing WCML) is likely to cause a moderate noise decrease affecting the

²² See Map Series SV-05 (SES1 and AP1 ES Volume 2, MA01 Map Book).

²³ HS2 Ltd continues to review the design and mitigation in line with their policy on ground-borne noise, and any changes to the design which reduce effects will be considered during design development.

²⁴ See Map Series SV-05 (SES1 and AP1 ES Volume 2, MA01 Map Book).

Significant effect number and map reference ²⁴	Source of significant effect (type)	Time of day	Location and details
			acoustic character of the area around the dwellings. There are no shared open spaces identified as being affected in this community.

5.1.273 For further information see SES1 and AP1 Volume 5, Appendix: SV-003-00000 and SES1 and AP1 Volume 5: Sound, noise and vibration Map Book.

Non-residential receptors: direct effects

5.1.274 The main ES identified a likely significant adverse operational ground-borne noise effect on the basis of a precautionary assessment at ChuffChuff (assessment location ref.: 610667), which is a multi-use venue for fitness, music, creative arts and dance, providing workspace for community groups and commercial purposes. This was denoted as MA01-O-N3 in the in the Volume 2, Community Area report: Hough to Walley's Green (MA01), in Volume 5, Appendix: SV-003-0MA01 and in the Volume 5, Sound, noise and vibration Map Book, Map Series SV-02 of the main ES. In the main ES, ground-borne noise was predicted to exceed the impact screening criteria, as defined in the SMR, of 30dB L_{pASmax} for recording studios by 14dB and the impact screening criteria of 40dB L_{pASmax} for teaching facilities by 4dB. The amendment will decrease ground-borne noise levels so that the impact screening criteria for teaching facilities is no longer exceeded. However, the impact screening criteria for recording studios is still predicted to be exceeded by 7dB. This will give rise to a different likely significant adverse operational ground-borne noise effect at ChuffChuff. There are no further changes to non-residential operational ground-borne noise direct effects as a result of this amendment.

Other mitigation measures

5.1.275 No other mitigation measures are included in the design at this stage.

Summary of likely residual significant effects

- 5.1.276 The amendment will give rise to a new likely significant residual adverse ground-borne noise effect on an individual property basis at Bridge Farm, Parkers Road, Crewe.
- 5.1.277 The amendment will give rise to different likely significant residual adverse ground-borne noise effects from operation of the AP1 revised scheme on residential communities in Crewe, due to a decrease in the number of dwellings affected and a reduction in the ground-borne noise and vibration impact classification at the most affected dwellings.
- 5.1.278 The amendment will give rise to different likely significant residual beneficial airborne noise effects from operation of the AP1 revised scheme on residential communities in Leighton, Crewe due to an increase in the number of dwellings beneficially affected.
- 5.1.279 The amendment will give rise to a different likely significant residual adverse ground-borne noise effect from operation of the AP1 revised scheme at ChuffChuff, Middlewich Street,

Crewe due to decreased ground-borne noise levels so that the impact screening criteria for teaching facilities is no longer exceeded.

Cumulative effects

- 5.1.280 No new, removed or different significant cumulative effects have been identified compared to the main ES.

Traffic and transport

Scope, assumptions and limitations

- 5.1.281 The assessment scope, key assumptions and limitations for traffic and transport are as set out in Volume 1 and the SMR of the main ES.
- 5.1.282 This amendment has the potential to result in new or different significant construction and operational effects for traffic and transport.
- 5.1.283 The assessment of the changes to traffic flows during construction and operation as a result of all AP1 amendments in combination with all SES1 changes is reported in Section 7.
- 5.1.284 The assessment in this section considers the potential effects on PRow and roadside footway users and parking and loading. No further traffic and transport effects reported in the main ES are considered to require reassessment as a result of the amendment.

Environmental baseline

Existing environmental baseline

- 5.1.285 The baseline traffic and transport information is described in Section 14 of Volume 2, Community Area report: Hough to Walley's Green (MA01) of the main ES, as amended in Section 2 of this report. A summary of the baseline information relevant to the assessment of the amendment is provided below.
- 5.1.286 Parkers Road is an unclassified local road in the Hough to Walley's Green area. The local road network in this area generally operates well although some localised delays can be experienced, particularly at peak times. Parkers Road is served by two bus services; route 12 (Shavington - Crewe - Leighton Hospital), and route 317 (Leighton Hospital - Sandbach - Rode Heath - Alsager).
- 5.1.287 There are a number of passenger and freight railways that run through the Hough to Walley's Green area, including the West Coast Main Line (WCML).
- 5.1.288 There are a number of PRow in the Hough to Walley's Green area. The PRow of relevance to the assessment of this amendment are:
- Footpath Crewe 12/1;
 - Footpath Crewe 29/1;

- Footpath Minshull Vernon 2/1;
- Footpath Warmingham 16/2; and
- Footpath Crewe 13/1.

5.1.289 Surveys undertaken to inform the assessment of the original scheme showed that Footpath Crewe 12/1 and Footpath Crewe 13/1 recorded no users on the day of the survey. Footpath Crewe 29/1 was used by three users on the day of the survey. The routes with the greatest daily usage were Footpath Minshull Vernon 2/1 and Footpath Warmingham 16/2, which were used by 35 users on the day of the survey.

5.1.290 There is off-street parking within the Hough to Walley's Green area. The off-street parking areas of relevance to the assessment of this amendment are located at:

- McColl's convenience store, off the B5076 Middlewich Street; and
- heavy goods vehicle (HGV) parking associated with the Crewe Truck Stop and Café, off the A532 Weston Road in Crewe.

Future environmental baseline

5.1.291 The future baseline relevant to the assessment of the amendment remains unchanged from that reported in Section 14 of Volume 2, Community Area report: Hough to Walley's Green (MA01) of the main ES.

Effects arising during construction

Avoidance and mitigation measures

5.1.292 No avoidance or mitigation measures additional to those reported in the main ES are required.

Assessment of impacts and effects

5.1.293 The main ES reported that the original scheme would require the temporary diversion of Footpath Crewe 12/1. As a result, users of Footpath Crewe 12/1 would be subjected to a minor adverse effect on non-traffic related severance, which is significant, due to an increase in journey length of up to 273m. The amendment will decrease the duration of the temporary diversion of Footpath Crewe 12/1 from five years and seven months, as reported in the main ES, to four years and 10 months. However, this will not change the level of significance of the effect reported in the main ES, which remains a minor adverse effect.

5.1.294 The main ES reported that the original scheme would require the temporary diversion of Footpath Crewe 29/1. As a result, users of Footpath Crewe 29/1 would be subject to a moderate adverse effect on non-traffic related severance, which is significant, due to an increase in journey length of up to 720m. The amendment will decrease the duration of the temporary diversion of Footpath Crewe 29/1 from three years and eight months, as reported in the main ES, to one year and 11 months. This will give rise to a different (decreased)

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significant effect; however, this will not change the level of significance of the effect reported in the main ES, which remains a moderate adverse effect.

- 5.1.295 The main ES reported that the original scheme would require the temporary diversion of Footpath Crewe 13/1. As a result, users of Footpath Crewe 13/1 would be subject to a minor adverse effect on non-traffic related severance, which is significant, due to an increase in journey length of up to 127m. The amendment will remove the temporary diversion of Footpath Crewe 13/1, which will remove the minor adverse significant effect on non-traffic related severance reported in the main ES.
- 5.1.296 The amendment will require the temporary closure and diversion of the public footway between Audley Street West and Sherborne Road for a duration of two months. This will result in a negligible change in journey length for non-motorised users and will not give rise to a new or different significant effect.
- 5.1.297 The main ES reported that the original scheme would require the temporary closure of Parkers Road. As a result, vehicle occupants on Parkers Road would be subject to a major adverse effect, which is significant, due to an increase in journey length of up to 2.7km. Users of bus routes 12 and 317 on Parkers Road would be subject to a moderate adverse effect, which is significant, due to changes in bus journey times resulting in public transport delays. Non-motorised users of Parkers Road would be diverted via a temporary footbridge, resulting in a negligible change in journey length that would not result in a significant effect. The amendment will remove the temporary closure of Parkers Road, which will remove the major adverse significant effect on vehicle occupants reported in the main ES. It will also remove the moderate adverse significant effect on public transport users reported in the main ES.
- 5.1.298 The main ES reported that the original scheme would require the temporary loss of four out of eight parking spaces at McColl's convenience store for a period of five years and two months, resulting in a major adverse effect, which is significant. The amendment will increase the duration of the temporary loss of parking spaces at McColl's convenience store from five years and two months, as reported in the main ES, to six years. However, this will not change the level of significance of the effect reported in the main ES, which remains a major adverse effect.
- 5.1.299 The main ES reported that the original scheme would require the temporary loss of 90 out of 120 existing HGV parking spaces at Crewe Truck Stop and Café for a period of five years and three months, as corrected in Section 2 of this report, resulting in a major adverse effect, which is significant. The amendment will result in changes to the highway access and layout of the Crewe Truck Stop and Café. This will result in the loss of 90 out of 120 HGV parking spaces changing from temporary, as reported in the main ES, to permanent in the AP1 revised scheme. The effect of this loss is reported in the operational assessment of this amendment. As a result, the amendment will remove the temporary major adverse effect due to the loss of HGV parking spaces; however, this is replaced by the permanent effect reported in the operation assessment.

5.1.300 The main ES reported that the original scheme would require a number of possessions and blockades in Hough to Walley's Green area, including the possession and blockade of the WCML to allow for the extension of the existing Parkers Road Overbridge and construction of the Parkers Road temporary footbridge. The combined effects of possessions and blockades of the original scheme was reported in Volume 3, Route-wide effects, Section 14 of the main ES. The amendment will remove the possessions and blockades of the WCML associated with Parkers Road Overbridge and Parkers Road temporary footbridge. The impact of this change on the WCML possessions and blockages, together with those in other Community Areas, are reported and assessed in SES1 and AP1 ES Volume 3, Route-wide effects, Section 14.

Other mitigation measures

5.1.301 No mitigation measures additional to those reported in the main ES and draft CoCP are required.

Summary of likely residual significant effects

5.1.302 The amendment will give rise to a different (decreased) moderate adverse significant effect due to the decreased duration of the temporary diversion of Footpath Crewe 29/1.

5.1.303 The amendment will remove the following likely residual temporary significant effects reported in the main ES:

- minor adverse significant effect on non-traffic related severance for non-motorised users of Footpath Crewe 13/1;
- major adverse effect on parking at Crewe Truck Stop and Café, which will be replaced with the permanent effect reported in the operation assessment;
- major adverse effect on vehicle occupants on Parkers Road; and
- moderate adverse effect on public transport users of bus routes 12 and 317 on Parkers Road.

Cumulative effects

5.1.304 There are no new, removed or different significant cumulative effects on PRow and footway users and parking and loading compared to the main ES.

5.1.305 The assessment of combined effects associated with changes in traffic flows as a result of this amendment in combination with all SES1 changes and AP1 amendments is reported in Section 7.

Effects arising during operation

Avoidance and mitigation measures

- 5.1.306 No avoidance or mitigation measures additional to those reported in the main ES are required.

Assessment of impacts and effects

- 5.1.307 The main ES reported that the original scheme would require the permanent diversion of Footpath Minshull Vernon 2/1 and Footpath Warmingham 16/2. As a result, non-motorised users of Footpath Minshull Vernon 2/1 and Footpath Warmingham 16/2 would be subject to a moderate adverse effect on non-traffic related severance, which is significant, due to an increase in journey length of 1.2km. The amendment will result in a change to the alignment of the Footpath Warmingham 16/2 diversion. This will extend the increase in journey length for non-motorised users of Footpath Minshull Vernon 2/1 and Footpath Warmingham 16/2 by 21m compared with the main ES. However, this will not change the level of significance of the effect reported in the main ES, which remains a moderate adverse effect.
- 5.1.308 The main ES reported that the original scheme would require the permanent diversion of Footpath Crewe 29/1. As a result, non-motorised users of Footpath Crewe 29/1 would be subject to a moderate adverse effect on non-traffic related severance, which is significant, due to an increase in journey length of up to 715m. The amendment will result in a change to the Footpath Crewe 29/1 overbridge design, which will include a greater span and revised earthworks and access ramps. However, this will not result in a change to the journey length for non-motorised users as reported in the main ES. This will therefore not change the level of significance of the effect reported in the main ES, which remains a moderate adverse effect.
- 5.1.309 The main ES reported that the original scheme would result in a major adverse effect on parking, which is significant, due to the permanent loss of approximately 59 out of 120 existing HGV parking spaces at the Crewe Truck Stop and Café, as corrected in Section 2 of this report. The amendment will result in changes to the highway access and layout of the Crewe Truck Stop and Café. This will increase the permanent loss of HGV parking spaces from 59 out of 120 spaces, as corrected in Section 2 of this report, to 90 out of 120 spaces. This will give rise to a different (increased) significant effect; however, this will not change the level of significance of the effect reported in the main ES, which remains a major adverse effect. As reported in the construction assessment, this permanent effect will replace the temporary major adverse effect reported in the main ES.

Other mitigation measures

- 5.1.310 No mitigation measures additional to those reported in the main ES are required.

Summary of likely residual significant effects

- 5.1.311 The amendment will give rise to a different (increased) major adverse significant effect due to the permanent loss of 90 out of 120 HGV parking spaces at Crewe Truck Stop and Café.

Cumulative effects

- 5.1.312 No new, removed or different significant cumulative effects have been identified compared to the main ES.

Water resources and flood risk

Scope, assumptions and limitations

- 5.1.313 The assessment scope, key assumptions and limitations for water resources and flood risk are as set out in Volume 1 and the SMR of the main ES.
- 5.1.314 Unless indicated otherwise, the spatial scope of the assessment (the study area) is based upon the identification of surface water and groundwater features within 1km of the route of the original scheme, as described in Section 2.2 of the Volume 2, Community Area report: Hough to Walley's Green (MA01) of the main ES. In the Hough to Walley's Green area, Bottoms Flash and Groby's Flash, which form the southern-most unit of the 14 units that make up Sandbach Flashes SSSI, were included in the study area for the main ES.
- 5.1.315 The hydrological impacts on biological receptors such as aquatic fauna and flora are reported below. Where these impacts have the potential to result in new or different significant effects, these are described in Section 5.1, Ecology and biodiversity.
- 5.1.316 This amendment has the potential to result in new or different significant construction effects on water resources only. There is no operational assessment for water resources, and no operational or construction assessment for flood risk.
- 5.1.317 Water resources and flood risk effects that result from the assessment of the changes to traffic flows as a result of all AP1 amendments in combination with all SES1 changes are reported in Section 7.

Environmental baseline

Existing environmental baseline

- 5.1.318 The baseline water resources and flood risk information is as described in Section 4 of Volume 2, Community Area report: Hough to Walley's Green (MA01) of the main ES. A summary of the baseline information relevant to the assessment of the amendment is provided below.
- 5.1.319 The additional land required for the realignment and extension of Crewe tunnel (AP1-001-001) is located in the area north of Parkers Road, Crewe. The underlying bedrock geology in

this area consists of the Sidmouth Mudstone Formation (part of the Mercia Mudstone Group), which is designated as a Secondary B aquifer. This is overlain by glacial till (Secondary (Undifferentiated) aquifer).

5.1.320 The following watercourses would have been affected by the original scheme and are also relevant to the assessment of this amendment. These watercourses are potentially fed by groundwater from the glacial till in this area:

- Tributary of Fowle Brook 1 (Low value); and
- Hoggins Brook (Low value).

5.1.321 Similarly, the following water dependent habitats were assessed in the main ES and the hydrology of these sites could potentially be impacted by this amendment:

- Sandbach Flashes SSSI (the southernmost unit, which consists of Bottoms Flash and Groby's Flash), due to potential changes in groundwater flow into local watercourses;
- Moss Bridge Marsh LWS; and
- Spring Plantation Grassland LWS.

Future environmental baseline

5.1.322 The Planning data report of the main ES (see Volume 5, Appendix: CT-004-00000 of the main ES) provides details of committed developments assumed to have been implemented by 2025. This information has been supplemented by the committed developments listed in the equivalent Volume 5 Planning data report of the SES1 and AP1 ES (see SES1 and AP1 ES Volume 5, Appendix: CT-004-00000). The developments have been considered to determine whether they would result in a material change to the future baseline or have the potential to give rise to cumulative effects. None of the identified developments affect the assessment of the SES scheme's likely construction and operation impacts on water resources and flood risk.

Effects arising during construction

Avoidance and mitigation measures

5.1.323 No mitigation measures additional to those reported in the main ES and draft CoCP are required.

Assessment of impacts and effects

Surface water

5.1.324 There are no new impacts or significant effects on surface water arising from the AP1 amendment.

Groundwater

- 5.1.325 As part of this amendment, Crewe tunnel north portal and associated retained cutting will move to the north of Parkers Road, Crewe. The retained cutting will penetrate the glacial till Secondary (Undifferentiated) aquifer and the Mercia Mudstone Group Secondary B aquifer. There is currently no available information on groundwater elevations or depth to groundwater in this area for the glacial till or the Mercia Mudstone. It has therefore been conservatively assumed that groundwater levels within the glacial till and the Mercia Mudstone are at ground level, and that groundwater flow may be affected by the retained cutting. Crewe tunnel north portal will penetrate the base of the glacial till and may extend into the top of the underlying Mercia Mudstone Group.
- 5.1.326 Assuming a maximum depth for the tunnel portal of 21.8m and groundwater level is at ground level, there is the potential for dewatering and damming undertaken at Crewe tunnel north portal and associated retained cutting to influence groundwater levels within the glacial till up to 515m away from the AP1 revised scheme. The amendment therefore has the potential to adversely impact on groundwater-surface water interactions over a wider area.
- 5.1.327 Assuming the groundwater flow direction in the glacial till follows topography, groundwater will flow towards the north or north-east. The retained cutting is aligned in approximately the same direction and, as a result, is not likely to form a substantive barrier to groundwater flow in the area. Whilst there may be local changes in groundwater level, on the scale of the glacial till aquifer in the area, the impact is assessed to be minor on the Secondary (Undifferentiated) aquifer, leading to a minor effect which is not significant.
- 5.1.328 In addition, this amendment includes a new basement structure beneath the headhouse building at Middlewich Street vent shaft. This 7m deep basement will be constructed within a continuous piled box of approximately 60m by 33m. The piles will extend approximately 12m into the ground, through the superficial glacial till deposits into the underlying Mercia Mudstone Group.
- 5.1.329 It has been conservatively assumed that groundwater levels within the glacial till and the Mercia Mudstone Group are at ground level and that groundwater flow within the glacial till and the Mercia Mudstone Group may be affected by the dewatering for the construction of the basement structure.
- 5.1.330 The proposed construction methodology will reduce the requirement for dewatering during construction of the basement in the superficial deposits. The basement base slab will be installed shortly after construction of the continuous piled walls and this will seal off the groundwater from the basement. As a result, the temporary impact of basement construction on groundwater levels and flow in the glacial till will be negligible, resulting in a negligible effect, which is not significant.
- 5.1.331 However, the basement structure will be of a relatively large size and the continuous piled walls will extend through the entire depth of the glacial till aquifer. This structure could therefore form a permanent barrier to groundwater movement in the glacial till in this area. Assuming that groundwater flow in the glacial till follows topography, it would flow from

north-east to south-west. As a result, groundwater levels could rise on the north-eastern side of the vent shaft, potentially giving rise to groundwater flooding at the surface at times of high groundwater levels, or groundwater flooding of any existing basements. A land drainage channel will be provided to allow groundwater to flow around the basement structure. This will be designed in consultation with the Environment Agency and the Lead Local Flood Authority following further investigations into the presence and quantity of groundwater in the glacial till. On a precautionary basis, this is assessed to be a permanent minor adverse impact on the moderate value glacial till aquifer leading to a minor adverse effect, which is not significant.

Groundwater – surface water interactions

- 5.1.332 A 420m reach of the headwaters of Tributary of Fowle Brook 1 is located within the radius of influence of Crewe tunnel north portal and associated retained cutting. The permanent lowering of groundwater levels, due to drainage of the portal and cutting, will lead to a reduction in flow within this low value watercourse. This watercourse will receive drainage discharge from an attenuation tank constructed as part of the AP1 revised scheme, which will help to support flows in this watercourse.
- 5.1.333 It is assumed on a precautionary basis that flow may change in some periods if there is less contribution from the drainage attenuation tank than would have originally come from groundwater. This is assessed to be a permanent minor impact on this low value receptor, leading to a negligible effect, which is not significant.

Water dependent habitats

- 5.1.334 Tributary of Fowle Brook 1 flows into the southernmost unit of Sandbach Flashes SSSI. This unit is known as Bottoms Flash and Groby's Flash, and it is considered to be a surface water dependant habitat. It is currently believed that surface water flood flows from the land to the west of the WCML, between Parkers Road and Spring Plantation, enters into drainage ditches which then flow north and enter into the catchment of Hoggins Brook. If this is the case then there would be no hydrological impact on Sandbach Flashes SSSI. However, it is possible that these surface water flood flows currently cross beneath the WCML in a culvert, close to Spring Plantation and drain into Tributary of Fowle Brook 1. If this is the case then the presence of the Crewe tunnel north portal and associated retained cutting will lead to a potential reduction in the catchment area of Tributary of Fowle Brook 1 and therefore, a reduction in flood flows to Sandbach Flashes SSSI. This would potentially lead to a reduction in catchment area to Tributary of Fowle Brook 1 of around 35%, and an overall reduction to the catchment area draining into Bottoms Flash and Groby's Flash of approximately 7%. On a precautionary basis, the potential change in flood flows in Tributary of Fowle Brook 1 during some periods is assessed to lead to a permanent moderate hydrological impact on Sandbach Flashes SSSI.
- 5.1.335 In addition, two LWS, Moss Bridge Marsh and Spring Plantation Grassland, are within the radius of influence of dewatering associated with Crewe tunnel north portal and associated retained cutting and are included here on a precautionary basis. Both sites are supported by

surface water (rainfall and drainage channels) and may also receive groundwater from the underlying glacial till. The lowering of groundwater levels at both of these sites due to the presence of the portal and associated retained cutting are assessed to be permanent moderate hydrological impacts on these sites.

- 5.1.336 Further details of the ecology of these water dependent habitats and the assessment of any local level ecological effects arising from hydrological impacts are provided in Ecology and biodiversity section.

Other mitigation measures

- 5.1.337 No other mitigation methods are required.

Summary of likely residual significant effects

- 5.1.338 With the implementation of the other mitigation measures set out in the main ES, there will be no new or different significant adverse residual effects related to water resources and flood risk due to the proposed amendment.

Cumulative effects

- 5.1.339 No new, removed or different significant cumulative effects have been identified compared to the main ES.

Summary of new or different likely residual significant effects as a result of the amendment

Construction

Agriculture, forestry and soils

- 5.1.340 The amendment will:
- result in a different significant temporary effect on Chaise Farm (MA01/7). The effect will be reduced from major/moderate adverse to moderate adverse, which remains significant;
 - introduce a new temporary moderate adverse significant effect for Land at Parkers Road (MA01/30); and
 - introduce a new permanent moderate adverse significant effect at Chaise Farm (MA01/7).

Community

- 5.1.341 The amendment will result in a new residual effect on approximately 10 residential properties at the junction of Warmingham Road and Waldron's Lane, Coppenthal Moss, due to HGV traffic effects and new noise and visual effects.

5.1.342 The amendment will result in a different residual effect on approximately 250 residential properties in the vicinity of Broughton Road, Coppenhall, due to significant road traffic noise and air quality effects, and the removal of noise and visual effects.

Ecology and biodiversity

5.1.343 The main ES reports a net loss of 10.1km of hedgerow habitat across the Hough to Walley's Green area, which represents an adverse residual effect that is significant at the county/metropolitan level. The amendment will result in the loss of an additional 349m of hedgerow habitat. However, this will not change the level of significance of the adverse residual effect on hedgerows, as reported within the main ES.

5.1.344 The amendment will, on a precautionary basis, result in a permanent adverse effect on the hydrology at Sandbach Flashes SSSI, which is significant at the national level. If required, an appropriate mitigation strategy will be developed to avoid significant effect on the conservation status of Sandbach Flashes SSSI, as far as is reasonably practicable.

Landscape and visual

5.1.345 In many cases, significant effects will reduce over time as the proposed mitigation planting matures and reaches its designed intention. The amendment will give rise to a different likely residual significant construction effect after implementation of construction phase mitigation, for the Crewe Fringe Mosslands LCA, but the level of effect will be unchanged to that reported in the main ES. The level of significance of the effect will remain **moderate** adverse (significant).

5.1.346 The amendment will give rise to a different likely residual significant construction effect after implementation of construction phase mitigation, at the following viewpoints:

- view east from Bleasdale Road and north from Thornfields, Leighton, Crewe (304-02-004) - the effect will increase to **major** adverse (significant); and
- view west from Broughton Road, Coppenhall, Crewe (304-02-002) - the effect will reduce to **moderate** adverse (significant).

5.1.347 The amendment will give rise to a new likely residual significant construction effect after implementation of construction phase mitigation, at the following viewpoint: view north-west from the White Lion Public House, Coppenhall Moss (304-02-003) - the effect will increase to **moderate** adverse (significant).

5.1.348 The amendment will give rise to a new likely residual significant construction effect, after implementation of construction phase mitigation, at the following new viewpoints which have been selected as the amendment has the potential to result in new or different effects:

- view north-east from Parkers Road (304-03-012) - the effect will be **major** adverse, (significant); and
- view west from Footpath Crewe 30/1, Kent's Lane (304-03-013) - the effect will be **major** adverse (significant).

- 5.1.349 The amendment will give rise to a different likely residual significant construction effect, after implementation of construction phase mitigation, at viewpoint: view west from Footpath Crewe 28/1 (Crewe and Nantwich Circular Walk), Coppenhall Moss (304-03-005) but the level of effect will be unchanged to that reported in the main ES. The effect will increase but will remain major adverse significant.
- 5.1.350 The amendment will give rise to a new likely residual significant construction night-time effect after implementation of construction phase mitigation, at the following viewpoints:
- view north-west from The White Lion public house, Coppenhall Moss (304-02-003) - the effect will increase to **moderate** adverse (significant);
 - view east from Bleasdale Road and north from Thornfields, Leighton, Crewe (304-02-004) - the effect will be **moderate** adverse (significant); and
 - view west from Footpath Crewe 30/1, Kent's Lane (304-03-013) – the effect will be **major** adverse (significant).

Socio-economics

- 5.1.351 The amendment will result in The White Lion public house no longer being subject to an adverse residual significant isolation effect. However, The White Lion public house will now be subject to a new adverse residual significant in-combination effect.

Sound, noise and vibration

- 5.1.352 The amendment will give rise to a new likely temporary residual adverse significant construction noise effect on the residential community of Coppenhall Moss.
- 5.1.353 Noise from specific construction activities has been identified as resulting in different likely temporary residual adverse significant effects on the non-residential buildings at:
- Cemetery Lodge, Market Close;
 - Orbitas Bereavement Services, Market Close; and
 - Crewe Cemetery and Crematorium, Market Close.

Traffic and transport

- 5.1.354 The amendment will give rise to a different (decreased) moderate adverse significant effect due to the decreased duration of the temporary diversion of Footpath Crewe 29/1.

Operation

Landscape and visual

- 5.1.355 For landscape and visual, the amendment will give rise to a different likely residual significant operational effect, at the following viewpoints at year 15, but where the level of effect is unchanged to that reported in the main ES:

- view north from public open space bordering the B5076 Middlewich (303-02-001) - the effect will remain **moderate** adverse (significant); and
- view south-east from public open space bordering the B5076 Middlewich Street (303-02-003) - the effect will remain **moderate** adverse (significant).

5.1.356 The amendment will give rise to a new likely residual significant operational visual effect not reported in the main ES at the following viewpoints at year 15:

- view north-east from Parkers Road (304-03-012) – the effect will be **major** adverse (significant); and
- view west from Footpath Crewe 30/1, Kent's Lane (304-03-013) – the effects will be **moderate** adverse (significant).

Sound, noise and vibration

5.1.357 The amendment will give rise to a new likely significant residual adverse ground-borne noise effect on an individual property basis at Bridge Farm, Parkers Road, Crewe.

5.1.358 The amendment will give rise to different likely significant residual adverse ground-borne noise effects from operation of the AP1 revised scheme on residential communities in Crewe, due to a decrease in the number of dwellings affected and a reduction in the ground-borne noise and vibration impact classification at the most affected dwellings.

5.1.359 The amendment will give rise to different likely significant residual beneficial airborne noise effects from operation of the AP1 revised scheme on residential communities in Leighton, Crewe due to an increase in the number of dwellings beneficially affected.

5.1.360 The amendment will give rise to a different likely significant residual adverse ground-borne noise effect from operation of the AP1 revised scheme at ChuffChuff, Middlewich Street, Crewe due to decreased ground-borne noise levels so that the impact screening criteria for teaching facilities is no longer exceeded.

Traffic and transport

5.1.361 The amendment will give rise to a different (increased) major adverse significant effect due to the permanent loss of 90 out of 120 HGV parking spaces at Crewe Truck Stop and Café.

Summary of likely residual significant effects that will be removed

5.1.362 The AP1 amendment will remove the following likely residual significant effects reported in the main ES:

- for agriculture, forestry and soils, remove a temporary moderate adverse significant effect at Bridge Farm (MA01/8);
- for agriculture, forestry and soils, remove a permanent moderate adverse significant effect at Bridge Farm (MA01/8);

- for historic environment, remove the likely residual significant effects on Bridge Farm and former farmstead, Parkers Road (MA01_0157);
- for sound, noise and vibration, removal of the likely temporary residual adverse significant construction noise effect on the residential communities of Coppenhall and Crewe north;
- for traffic and transport, minor adverse significant effect on non-traffic related severance for non-motorised users of Footpath Crewe 13/1;
- for traffic and transport, major adverse effect on parking at Crewe Truck Stop and Café, which will be replaced with the permanent effect reported in the operation assessment;
- for traffic and transport, major adverse effect on vehicle occupants on Parkers Road; and
- for traffic and transport, moderate adverse effect on public transport users of bus routes 12 and 317 on Parkers Road.

5.2 Additional land permanently required for the provision of a power supply to Crewe tunnel (AP1-001-002)

- 5.2.1 The Bill provides for an electricity supply for two tunnel boring machines (TBM) via two 33kv Scottish Power underground cables 4.3km in length, from the existing Scottish Power primary substation in south-west Crewe to Crewe tunnel north portal (located within the section of route shown on Volume 2, MA01 Map Book, maps CT-06-305 to CT-06-305-L3 in the main ES). The electricity supply for the TBM would be installed within the public highway on Middlewich Road, Pyms Lane, Badger Avenue, Underwood Lane, Bradfield Road and Broughton Road. Construction of the new electricity supply would take nine months to complete and would be managed from Crewe tunnel north main compound.
- 5.2.2 Since the main ES, following engagement with stakeholders, further design development has been carried out to avoid routeing the cables through land with existing planning permission, specifically Bentley Motors Ltd committed development MA01/127.
- 5.2.3 Footpath Crewe 27/1 joins the A532 West Street (see SES1 and AP1 ES Volume 2, MA01 Map Book: map CT-05-305-L2, C6). The section of footway between Bowen Cooke Avenue and the A532 West Street will be temporarily closed for a period of one month (see SES1 and AP1 ES Volume 2, MA01 Map Book: map CT-05-305-L1, C2).
- 5.2.4 Works to install the electricity supply along Halton Drive will lead to some permanent tree and vegetation loss. Replacement landscape mitigation planting will be provided (see SES1 and AP1 ES Volume 2, MA01 Map Book: map CT-06-305-L3, E8).
- 5.2.5 The electricity supply will be installed within the public highway on Halton Drive, Sunnybank Road, the A532 West Street, Bowen Cooke Avenue, Badger Avenue, Underwood Lane, Bradfield Road, and Broughton Road. In total, the new electricity supply will be 5km in length

and take 1 year and 1 month to complete. The works will be managed from Crewe tunnel north main compound.

- 5.2.6 The land required for this amendment is outside the limits of the Bill. The amendment will result in the permanent requirement for an additional 0.1ha of land (see SES1 and AP1 ES Volume 2, MA01 Map Book: map CT-05-306, E8). The amendment will result in the temporary requirement for an additional 32.9ha of land (see SES1 and AP1 ES Volume 2, MA01 Map Book: maps CT-05-305-L1 to CT-05-305-L3).

Local alternatives

- 5.2.7 The SES1 and AP1 Alternatives report (see SES1 and AP1 ES Volume 5, Appendix: CT-003-00000) describes the local alternatives considered as part of the design development of this amendment.

Topics included in the AP1 assessment

- 5.2.8 The assessment of this AP1 amendment has identified new, different or removed likely significant effects for the following topics: ecology and biodiversity; landscape and visual; socio-economics; and traffic and transport.
- 5.2.9 The assessment of the changes to construction traffic flows and traffic related effects as a result of this amendment in combination with all SES1 changes and AP1 amendments, is reported in Section 7. Topics where a significant effect has been identified due to changes to traffic flows are reported in Section 7 and include air quality.

Ecology and biodiversity

Scope, assumptions and limitations

- 5.2.10 This amendment has the potential to result in new or different significant construction effects only. Therefore, there is no operational assessment for ecology and biodiversity.
- 5.2.11 The assessment scope, key assumptions and limitations for ecology and biodiversity are as set out in Volume 1 and the SMR of the main ES.
- 5.2.12 Where there are limitations in data, a precautionary baseline has been taken following the approach set out in the SMR which constitutes a 'reasonable worst-case' basis for the subsequent assessment.
- 5.2.13 Ecology and biodiversity effects that result from the assessment of the changes to traffic flows as a result of all AP1 amendments in combination with all SES1 changes are reported in Section 7.

Environmental baseline

Existing environmental baseline

- 5.2.14 The baseline ecology and biodiversity information is as described in Section 7 of Volume 2, Community Area report: Hough to Walley's Green (MA01) of the main ES. A summary of the baseline information relevant to the assessment of the amendment is provided below.

Designated sites

- 5.2.15 The land required for the amendment is located within the Natural England Impact Risk Zone for Sandbach Flashes SSSI, which is a site of national value. The SSSI is located west of Sandbach, approximately 2.8km north-east of the land required for the amendment.
- 5.2.16 There is one LWS of relevance to the assessment of the amendment, which is of county/metropolitan value. Crewe Swift Colony LWS is located partially within land required for installation of an underground electricity cable and is also located adjacent to the A532 West Street, a construction traffic route.

Future environmental baseline

- 5.2.17 The Planning data report of the main ES (see Volume 5, Appendix: CT-004-00000 of the main ES) provides details of committed developments assumed to have been implemented by 2025. This information has been supplemented by the committed developments listed in the equivalent Volume 5 Planning data report of the SES1 and AP1 ES (see SES1 and AP1 ES Volume 5, Appendix: CT-004-00000). These committed developments have been considered as a future baseline where relevant, and their potential to give rise to cumulative effects has been assessed. None of the identified developments affect the assessment of the likely construction and operation impacts on ecology and biodiversity from the amendment.

Effects arising during construction

Avoidance and mitigation measures

- 5.2.18 No avoidance or mitigation measures, additional to those reported in the main ES and draft CoCP, are required.

Assessment of impacts and effects

Designated sites

- 5.2.19 Whilst the amendment is within the IRZ for Sandbach Flashes SSSI, due to the small-scale nature of the works required and the distance to the SSSI, the amendment is not likely to result in an adverse effect on the integrity of the SSSI.
- 5.2.20 The main ES reported that, with respect to utilities works, it is normally assumed that all habitat is lost from the land required for construction. However, for some utilities works, it

was possible to exclude significant effects on some receptors, including Crewe Swift Colony LWS, on the basis of the construction methods to be used. Although the extent of the LWS within land required for the AP1 revised scheme has increased to 0.56 ha from the 0.24 ha required for the original scheme, the same assumptions on construction methods apply. As such, there will be no new significant effects on Crewe Swift Colony LWS as a result of the amendment.

Summary of likely residual significant effects

- 5.2.21 There are no changes to the likely residual significant effects identified in the main ES as a result of the amendment.

Cumulative effects

- 5.2.22 No new, removed or different significant cumulative effects have been identified compared to the main ES.

Landscape and visual

Scope, assumptions and limitations

- 5.2.23 The assessment scope, key assumptions and limitations for landscape and visual are as set out in Volume 1 and the SMR of the main ES.
- 5.2.24 The amendment has the potential to result in new or different significant construction visual effects only. Therefore, there are no construction or operational phase landscape assessments and no operational phase visual assessment.
- 5.2.25 All landscape and visual effects arising from this amendment are reported in SES1 and AP1 ES Volume 5, Appendix: LV-001-0MA01.

Environmental baseline

Existing environmental baseline

- 5.2.26 The baseline landscape and visual information is as described Volume 5, Appendix: LV-001-0MA01 of the main ES. A summary of the baseline information relevant to the assessment of the amendment is provided below.

Visual baseline

- 5.2.27 The amendment has the potential to significantly affect one new viewpoint, which would be unaffected by the original scheme. This viewpoint is described in the SES1 and AP1 ES Volume 5, Appendix: LV-001-0MA01 and summarised below.

View west from Halton Drive (high sensitivity receptors) (303-02-005)

- 5.2.28 This new viewpoint is located in an area which would be unaffected by the original scheme and represents the views experienced by residents of Halton Drive. It is located in Crewe and comprises red-brick, two-storey residential properties on both sides of a residential road. Halton Drive is defined to its western extent by a steel palisade fence, which partially screens views of pylons in the middle distance. In the distance, industrial buildings and structures associated with an electricity substation are partially visible in views filtered by a linear belt of mature, predominantly deciduous, woodland.

Future environmental baseline

- 5.2.29 The Planning data report of the main ES (see Volume 5, Appendix: CT-004-00000 of the main ES) provides details of committed developments assumed to have been implemented by 2025. This information has been supplemented by the committed developments listed in the equivalent Volume 5 Planning data report of the SES1 and AP1 ES (see SES1 and AP1 ES Volume 5, Appendix: CT-004-00000). These committed developments have been considered as a future baseline where relevant.
- 5.2.30 None of the identified committed developments will alter the baseline conditions in 2025 or 2038 for landscape or visual amenity.

Effects arising during construction

Avoidance and mitigation measures

- 5.2.31 No mitigation measures additional to those reported in the main ES and draft CoCP are proposed.

Assessment of impacts and effects

Visual effects

View west from Halton Drive (high sensitivity receptors) (303-02-005)

- 5.2.32 This new viewpoint is located in an area which would be unaffected by the original scheme. Residents of **high** susceptibility with **medium** value views will experience a noticeable change to near-distance views of construction works associated with the amendment. This will include vegetation clearance at the western end of Halton Drive to facilitate utilities works. There will be temporary disruption to the existing residential roads as part of construction works to lay cabling along Halton Drive and adjacent streets. As a result, residents will experience direct views of these small-scale works within the immediate streetscape. The amendment will give rise to a **medium** magnitude of change and a **moderate** adverse (significant) effect. The amendment will therefore give rise to a new significant effect.
- 5.2.33 For further information see SES1 and AP1 ES Volume 5, Appendix: LV-001-0MA01.

Other mitigation measures

- 5.2.34 No mitigation measures additional to those reported in the main ES and draft CoCP are proposed.

Summary of likely residual significant effects

- 5.2.35 In many cases, significant effects will reduce over time as the proposed mitigation planting matures and reaches its designed intention. However, the amendment will give rise to a new likely residual significant construction effect after implementation of construction phase mitigation, in an area which was not affected by the original scheme for views west from Halton Drive (303-02-005) which is a new viewpoint in an area that would be unaffected by the original scheme. Effect will be **moderate** adverse (significant).

Cumulative effects

- 5.2.36 No new, removed or different significant cumulative effects have been identified compared to the main ES.

Socio-economics

Scope, assumptions and limitations

- 5.2.37 The assessment scope, key assumptions and limitations for socio-economics are as set out in Volume 1 and the SMR of the main ES. This amendment has the potential to result in new or different significant construction effects only. Therefore, there is no operational assessment for socio-economics.

Environmental baseline

Existing environmental baseline

- 5.2.38 The baseline socio-economics information is as described in Section 12 of Volume 2, Community Area report: Hough to Walley's Green (MA01) of the main ES.

Future environmental baseline

- 5.2.39 The Planning data report of the main ES (see Volume 5, Appendix: CT-004-00000 of the main ES) provides details of committed developments assumed to have been implemented by 2025. This information has been supplemented by the committed developments listed in the equivalent Volume 5 Planning data report of the SES1 and AP1 ES (see SES1 and AP1 Volume 5, Appendix: CT-004-00000). These committed developments have been considered as a future baseline where relevant. No committed developments of relevance for the socio-economic assessment have been identified that would materially alter the future baseline in this area.

Effects arising during construction

Avoidance and mitigation measures

- 5.2.40 No mitigation measures additional to those reported in the main ES and draft CoCP¹ are required.

Assessment of impacts and effects

- 5.2.41 The main ES reported that the construction of two new underground Scottish Power electricity cables would require the permanent acquisition of land with existing planning permission. This would result in a major adverse significant effect on Bentley Motors Ltd (MA01/127) on Pyms Lane.
- 5.2.42 The amendment provides for alternative routeing of the two underground Scottish Power electricity cables. This amendment will remove the need to acquire land with extant planning permission. Therefore, the significant effect on Bentley Motors Ltd (MA01/127) on Pyms Lane will no longer occur.
- 5.2.43 It is estimated that as a result of the amendment 870 jobs will be retained within the Hough to Walley's Green area, which were reported to be either displaced or lost due to land required for the construction of the original scheme.

Other mitigation measures

- 5.2.44 No mitigation measures additional to those reported in the main ES and draft CoCP are required.

Summary of likely residual significant effects

- 5.2.45 The amendment will remove the requirement for the permanent acquisition of land with existing planning permission. Therefore, Bentley Motors Ltd (MA01/127) on Pyms Lane is no longer subject to an adverse residual significant effect.

Cumulative effects

- 5.2.46 No new, removed or different significant cumulative effects have been identified compared to the main ES.

Traffic and transport

Scope, assumptions and limitations

- 5.2.47 The assessment scope, key assumptions and limitations for traffic and transport are as set out in Volume 1 and the SMR of the main ES.

- 5.2.48 This amendment has the potential to result in new or different significant construction effects only. Therefore, there is no operational assessment for traffic and transport.
- 5.2.49 The assessment of the changes to traffic flows during construction and operation as a result of all AP1 amendments in combination with all SES1 changes is reported in Section 7.
- 5.2.50 The assessment in this section considers the potential effects on PRoW and roadside footway users and changes in journey lengths for vehicle occupants and public transport users. No further traffic and transport effects reported in the main ES are considered to require reassessment as a result of the amendment.

Environmental baseline

Existing environmental baseline

- 5.2.51 The baseline traffic and transport information is described in Section 14 of Volume 2, Community Area report: Hough to Walley's Green (MA01) of the main ES, as amended in Section 2 of this report. A summary of the baseline information relevant to the assessment of the amendment is provided below.
- 5.2.52 The A530 Middlewich Road, which connects the A51 Nantwich Bypass with the A530 Nantwich Road, is a primary 'A' road in the Hough to Walley's Green area. The A532 West Street/Coppenhall Lane connects the A530 Middlewich Road with the A532 Vernon Way. Both roads generally operate well although some localised delays can be experienced, particularly at peak times.
- 5.2.53 The A532 West Street is served by five bus services, route 6 (Leighton Hospital - Crewe - Shavington); route 6E (Leighton Hospital - Crewe - Shavington); route 8 (Wistaston Green - Crewe - Sydney - Elm Drive); route 31 (Crewe - Leighton Hospital - Winsford/Northwich), route 31A (Crewe - Leighton Hospital - Winsford/Northwich); and route 85 (Nantwich - Crewe - Keele University - Newcastle - Hanley). The A532 Coppenhall Lane is served by one bus service, route 85 (Nantwich - Crewe - Keele University - Newcastle - Hanley).
- 5.2.54 The main local roads of relevance to the assessment of this amendment are:
- Pyms Lane, which connects the A530 Middlewich Road with Minshull New Road;
 - Badger Avenue, which connects Pyms Lane with the B5076 Middlewich Street;
 - Underwood Lane, which connects the A532 West Street with Bradfield Road; and
 - Bowen Cooke Avenue, which connects McNeill Avenue with Badger Avenue.
- 5.2.55 The local road network in this area generally operates well although some localised delays can be experienced, particularly at peak times.
- 5.2.56 There are a number of PRoW and footways in the Hough to Walley's Green area. The footway of relevance to the assessment of this amendment is Bowen Cooke Avenue footway between McNeill Avenue and the A532 West Street. No survey information is available for

Bowen Cooke Avenue footway; however, in the absence of information the assessment is based on conservative assumptions regarding usage.

Future environmental baseline

- 5.2.57 The Planning data report (see Volume 5, Appendix: CT-004-00000 of the main ES) provides details of committed developments assumed to have been implemented by 2025. These committed developments have been considered as part of the future baseline where relevant.

Effects arising during construction

Avoidance and mitigation measures

- 5.2.58 No avoidance or mitigation measures additional to those reported in the main ES are required.

Assessment of impacts and effects

- 5.2.59 The main ES reported that utility works and associated traffic management along the route of the power supply to Crewe Tunnel, including temporary shuttle working with traffic control, would be required for a period of nine months on the A530 Middlewich Road, Pyms Lane and Underwood Lane. This would result in no change in journey length and would not result in a significant effect.
- 5.2.60 The amendment includes changes to the route of the power supply. This will remove the need for temporary traffic management and shuttle working on the A530 Middlewich Road, Pyms Lane and Underwood Lane, as reported in the main ES. The revised route of the power supply will require utility works and associated traffic management, including temporary shuttle working with traffic control, on the A532 West Street/Coppenhall Lane for a period of two months. This will result in no change in journey length and will not give rise to a new or different significant effect for vehicle occupants or public transport users of the A532 West Street/Coppenhall Lane. Temporary traffic management on Badger Avenue will be required for a period of two weeks as a result of the amendment, compared to three weeks under the original scheme. This will result in no change in journey length and will not give rise to a new or different significant effect.
- 5.2.61 The main ES reported no significant effects on non-motorised users of Bowen Cooke Avenue footway as a result of the original scheme. Utility works associated with the amendment will require the temporary closure and diversion of the Bowen Cooke Avenue footway between McNeill Avenue and the A532 West Street for a duration of one month. This will give rise to a new temporary minor adverse effect on non-traffic related severance, which is significant, due to an increase in journey length for users of Bowen Cooke Avenue footway of up to 125m.

Other mitigation measures

- 5.2.62 No mitigation measures additional to those reported in the main ES and draft CoCP are required.

Summary of likely residual significant effects

- 5.2.63 The amendment will give rise to a new likely residual temporary minor adverse significant effect on non-traffic related severance for users of Bowen Cooke Avenue footway, due to an increase in journey length of up to 125m.

Cumulative effects

- 5.2.64 There are no new or different likely significant cumulative effects on PRow and roadside footway users and changes in journey lengths for vehicle occupants and public transport users as a result of the amendment acting in combination with any other SES1 changes or AP1 amendments.
- 5.2.65 The assessment of combined effects associated with changes in traffic flows as a result of this amendment in combination with all SES1 changes and AP1 amendments is reported in Section 7.

Summary of new or different likely residual significant effects as a result of the amendment

Construction

Landscape and visual

- 5.2.66 In many cases, significant effects will reduce over time as the proposed mitigation planting matures and reaches its designed intention. However, the amendment will give rise to a new likely residual significant construction effect after implementation of construction phase mitigation, in an area which was not affected by the original scheme for views west from Halton Drive (303-02-005) which is a new viewpoint in an area that would be unaffected by the original scheme. Effect will be **moderate** adverse (significant).

Traffic and transport

- 5.2.67 The amendment will give rise to a new likely residual temporary minor adverse significant effect on non-traffic related severance for users of Bowen Cooke Avenue footway, due to an increase in journey length of up to 125m.

Summary of likely residual significant effects that will be removed

- 5.2.68 The AP1 amendment will remove the following likely residual significant effects reported in the main ES: For socio-economics, remove the requirement for the permanent acquisition of land with existing planning permission. Therefore, Bentley Motors Ltd (MA01/127) on Pyms Lane is no longer subject to an adverse residual significant effect.

5.3 Change to Bill powers required for the diversion of Footpath Crewe 12/1 (AP1-001-003)

- 5.3.1 The Bill provides for the diversion of a section of Footpath Crewe 12/1 up to 2km west and north of its current alignment. The footpath would connect with Footpath Crewe 29/1 and Footpath Leighton 7/1 on the western side of the WCML, increasing journey length by 271m (see Volume 2, MA01 Map Book, map CT-06-306, D4 to F6 in the main ES). The Bill provides for Footpath Crewe 29/1 accommodation overbridge to convey Footpath Crewe 29/1 over the WCML, the HS2 route and the tributary of Fowle Brook 1. The Bill also provides for Footpath Crewe 29/1 offline culvert to convey Hoggins Brook under the diverted section of Footpath Crewe 29/1.
- 5.3.2 Since the main ES, the requirement for an additional section of footpath on the western side of the HS2 route to join Footpath Crewe 12/1 to Footpath Crewe 12/2 has been identified to retain connectivity and reduce journey length for users of the footpaths. To provide this additional section of footpath, the diverted length of Footpath Crewe 12/1 will be extended by 275m to run alongside the southern edge of Footpath Crewe 29/1 overbridge approach ramp.
- 5.3.3 Both the route of the extended Footpath Crewe 12/1 diversion and a HS2 maintenance access route will cross the tributary of Fowle Brook 1. Footpath Crewe 29/1 offline culvert will be extended by approximately 7m to carry the tributary of Fowle Brook 1 under the extended footpath diversion and the HS2 maintenance access route.
- 5.3.4 The vertical alignment of the Footpath Crewe 29/1 offline culvert will not change from the original scheme. However, 60m of retaining walls will be required alongside the footpath, up to 2.2m in height, in order for Footpath Crewe 12/1 to cross the extended culvert.
- 5.3.5 The amendment will be constructed within the indicative construction programme set out in the main ES.
- 5.3.6 The land required for this amendment is within the limits of the Bill, but the amendment will require a change to Bill powers.

Topics included in the AP1 assessment

- 5.3.7 The assessment of this AP1 amendment has identified new, different or removed likely significant effects for the following topics: traffic and transport.
- 5.3.8 The assessment of the changes to construction traffic flows and traffic related effects as a result of this amendment in combination with all SES1 changes and AP1 amendments, is reported in Section 7. Topics where a significant effect has been identified due to changes to traffic flows are reported in Section 7 and include air quality.

Traffic and transport

Scope, assumptions and limitations

- 5.3.9 The assessment scope, key assumptions and limitations for traffic and transport are as set out in Volume 1 and the SMR of the main ES.
- 5.3.10 This amendment has the potential to result in new or different significant operational effects only. Therefore, there is no construction assessment for traffic and transport.
- 5.3.11 The assessment of the changes to traffic flows during construction and operation as a result of all AP1 amendments in combination with all SES1 changes is reported in Section 7.
- 5.3.12 The assessment in this section considers the potential effects on PRoW and roadside footway users. No further traffic and transport effects reported in the main ES are considered to require reassessment as a result of the amendment.

Environmental baseline

Existing environmental baseline

- 5.3.13 The baseline traffic and transport information is described in Section 14 of Volume 2, Community Area report: Hough to Walley's Green (MA01) of the main ES, as amended in Section 2 of this report. A summary of the baseline information relevant to the assessment of the amendment is provided below.
- 5.3.14 There are a number of PRoW in the Hough to Walley's Green area. The PRoW of relevance to the assessment of this amendment is Footpath Crewe 12/1.
- 5.3.15 Surveys undertaken to inform the assessment of the original scheme showed that Footpath Crewe 12/1 recorded no users on the day of the survey.

Future environmental baseline

- 5.3.16 The future baseline relevant to the assessment of the amendment remains unchanged from that reported in Section 14 of Volume 2, Community Area report: Hough to Walley's Green (MA01) of the main ES.

Effects arising during operation

Avoidance and mitigation measures

- 5.3.17 No avoidance or mitigation measures additional to those reported in the main ES are required.

Assessment of impacts and effects

- 5.3.18 The main ES reported that the original scheme would require the permanent diversion of Footpath Crewe 12/1. As a result, non-motorised users of Footpath Crewe 12/1 would be subject to a minor adverse effect on non-traffic related severance, which is significant, due to an increase in journey length of up to 271m.
- 5.3.19 The amendment will extend the Footpath Crewe 12/1 diversion to join to Footpath Crewe 12/2. For users travelling from Parkers Road to Moss Lane, the amendment will reduce the increase in journey length for users of Footpath Crewe 12/1 from 271m, as reported in the main ES, to 23m. The amendment will not change the journey length for users of Footpath Crewe 12/1 travelling between Coppenhall Moss and Moss Lane. This journey length will increase by 235m and is unchanged from the original scheme. Although the additional journey length will reduce substantially for some users, this will not change the level of significance of the effect reported in the main ES, which remains a minor adverse effect.

Other mitigation measures

- 5.3.20 No mitigation measures additional to those reported in the main ES are required.

Cumulative effects

- 5.3.21 There are no new or different likely significant cumulative effects on PRoW and footway users as a result of the amendment acting in combination with any other SES1 changes or AP1 amendments.
- 5.3.22 The assessment of combined effects associated with changes in traffic flows as a result of this amendment in combination with all SES1 changes and AP1 amendments is reported in Section 7.

Summary of likely residual significant effects

- 5.3.23 There are no changes to the likely residual significant effects identified in the main ES as a result of the amendment.

Summary of new or different likely residual significant effects as a result of the amendment

- 5.3.24 The amendment will not result in any new or different residual significant effects.

5.4 Additional land temporarily required for modifications to Warmingham Road and Groby Road junction (AP1-001-004)

- 5.4.1 The Bill provides for temporary improvements at the junction of Warmingham Road and Groby Road to allow construction traffic movements.
- 5.4.2 Since the main ES, it has been identified that there is a need to address a capacity issue as a result of HS2 construction traffic at the Warmingham Road junction with Groby Road. Further assessment has indicated a requirement to modify the existing junction layout to increase capacity and reduce the impact of construction traffic movements on road users.
- 5.4.3 The junction will be temporarily modified to include carriageway widening by up to 8m to enable the formation of a right-turn lane to the south of the junction on Warmingham Road and a left-turn lane to the north of the junction on Warmingham Road.
- 5.4.4 In addition, modifications to the existing kerb lines, road markings and the relocation of highway drainage along these new kerb lines will be required. Traffic signals will be installed to control movements at the junction.
- 5.4.5 The amendment will be constructed within the indicative construction programme set out in the main ES. The original configuration of the junction will be reinstated following the completion of construction and use of the construction traffic route.
- 5.4.6 The land required for this amendment is outside the limits of the Bill. The amendment will result in the temporary requirement for an additional 5ha of land (see SES1 and AP1 ES Volume 2, MA01 Map Book: maps CT-05-305-R1, B4 to C6 and CT-06-305-R1, B4 to C6).

Topics included in the AP1 assessment

- 5.4.7 The assessment of this AP1 amendment has identified new, different or removed likely significant effects for the following topics: agriculture, forestry and soils; community; health; landscape and visual; and sound, noise and vibration.
- 5.4.8 The assessment of the changes to construction traffic flows and traffic related effects as a result of this amendment in combination with all SES1 changes and AP1 amendments, is reported in Section 7. Topics where a significant effect has been identified due to changes to traffic flows are reported in Section 7 and include air quality.

Agriculture, forestry and soils

Scope, assumptions and limitations

- 5.4.9 The assessment scope, key assumptions and limitations for agriculture, forestry and soils are as set out in Volume 1 and the SMR of the main ES.

5.4.10 The amendment has the potential to result in new or different significant construction effects only. Therefore, there is no operational assessment for agriculture, forestry and soils.

Environmental baseline

Existing environmental baseline

5.4.11 The baseline agriculture, forestry and soils information for the Hough to Walley's Green area is as described in Volume 2, Community Area report: MA01, Section 4 of the main ES.

5.4.12 The agricultural land associated with this amendment has soils of the Crewe association. These soils comprise fine loamy over clay soils, developed in reddish, stoneless, glacial till and lake deposits overlying the Sidmouth Mudstone. The soils are seasonally waterlogged for long periods during the winter (Wetness Class IV) and the land is limited by soil wetness to Subgrade 3b.

5.4.13 Three agricultural holdings would be affected by this amendment of which two (MA01/28 and MA01/29) are newly affected. The characteristics of these holdings are summarised in Table 12.

Table 12: Summary characteristics of holdings

Holding reference/name	Holding type	Holding size (ha)	Diversification	Agri-environment scheme	Sensitivity to change
MA01/17 Lane Ends Farm	Dairy	93	Farm buildings let	Mid-tier CSS	Medium
MA01/28 * Land at Groby Road	Grassland	0.5	Not known	None	Low
MA01/29 * Brook Farm, Moston	Grassland	53	Not known	None	Medium

** It has not been possible to arrange a farm impact assessment interview with this holding. Publicly available sources have been used to obtain the information presented.*

Future environmental baseline

5.4.14 The Planning data report of the main ES (see Volume 5, Appendix: CT-004-00000 of the main ES) provides details of committed developments assumed to have been implemented by 2025. This information has been supplemented by the committed developments listed in the equivalent Volume 5 Planning data report of the SES1 and AP1 ES (see SES1 and AP1 Volume 5, Appendix: CT-004-00000). These committed developments have been considered to determine whether they would result in a material change to the future baseline or have the potential to give rise to cumulative effects. None of the identified committed developments

affect the assessment of the AP1 revised scheme's likely construction and operation impacts on agriculture, forestry and soil.

Effects arising during construction

Avoidance and mitigation measures

5.4.15 No mitigation measures additional to those reported in the main ES and draft CoCP, are required.

Assessment of impacts and effects

5.4.16 In terms of the impact on agricultural land, the amendment will require a further 0.3ha of agricultural land classified as Subgrade 3b. The amendment will make no difference to the overall effect on best and most versatile (BMV) agricultural land during construction which remains as reported in the main ES and is moderate adverse, which is significant.

5.4.17 The impacts on the holdings affected by the amendment are set out in Table 13 and Table 14.

Table 13: Temporary impacts and effects on holdings from construction of AP-001-152

Holding reference/ name	Total area required from holding	Construction severance	Disruption	Scale of construction effect	Changes in effect from main ES
MA01/17 Lane Ends Farm	1.4ha, 2% Negligible	Negligible	Negligible	Negligible	No change
MA01/28 Land at Groby Road	<0.1ha, 15% Medium	Negligible	Negligible	Minor adverse	New holding affected
MA01/29 Brook Farm, Moston	<0.1ha, <1% Negligible	Negligible	Negligible	Negligible	New holding affected

Table 14: Permanent impacts and effects on holdings from construction of AP-001-152

Holding reference/ name	Land required from holding	Severance	Infrastructure	Scale of effect	Changes in effect from main ES
MA01/17 Lane Ends Farm	0.5ha, <1% Negligible	Negligible	Negligible	Negligible	No change
MA01/28 Land at Groby Road	<0.1ha, 8% Low	Negligible	Negligible	Negligible	New holding affected
MA01/29 Brook Farm, Moston	0.0ha, 0% Negligible	Negligible	Negligible	Negligible	New holding affected

Other mitigation measures

- 5.4.18 Land required temporarily for construction will be restored to its former agricultural condition once the works are completed, following good practice techniques in handling, storing and reinstating soils on that land, as set out in the draft CoCP. No other mitigation has been identified.

Summary of likely residual significant effects

- 5.4.19 The amendment will not result in any new or different likely residual significant effects.

Cumulative effects

- 5.4.20 No new, removed or different significant cumulative effects have been identified with other SES1 of AP1 amendments.

Community

Scope, assumptions and limitations

- 5.4.21 The assessment scope, key assumptions and limitations for community are as set out in Volume 1 and the SMR of the main ES.
- 5.4.22 This amendment has the potential to result in new or different significant construction effects only. Therefore, there is no operational assessment for community.
- 5.4.23 Community effects that result from the assessment of the changes to traffic flows as a result of all AP1 amendments in combination with all SES1 changes are reported in Section 7.

Environmental baseline

Existing environmental baseline

- 5.4.24 The baseline community information is as described in Section 6 of Volume 2, Community Area report: Hough to Walley's Green (MA01) of the main ES. A summary of the baseline information relevant to the assessment of the amendment is provided below.
- 5.4.25 Crewe comprises approximately 30,000 residential properties. The route of the original scheme passes underneath Crewe in tunnel. Crewe has several suburbs including Leighton, Maw Green, Sydney and Coppenhall Moss.
- 5.4.26 Oakfield Lodge School is a pupil referral unit and provides alternative education provision for children who are unable to attend mainstream school. Oakfield Lodge School is located 750m east of the route of the original scheme, and immediately adjacent to land required for this amendment.

Future environmental baseline

- 5.4.27 The Planning data report of the main ES (see Volume 5, Appendix: CT-004-00000 of the main ES) provides details of committed developments assumed to have been implemented by 2025. This information has been supplemented by the committed developments listed in the equivalent Volume 5 Planning data report of the SES1 and AP1 ES (see SES1 and AP1 Volume 5, Appendix: CT-004-00000). These committed developments have been considered as a future baseline where relevant.
- 5.4.28 Committed developments of relevance to the community assessment that would materially alter the future baseline during construction of the AP1 revised scheme in this area, are set out in Table 15.

Table 15: Committed developments of relevance to community during construction

Map book reference ²⁵	Planning reference	Description	How this is considered in the assessment
MA01/448S	21/1598N	Location: Oakfield Lodge School, Warmingham Road, Crewe, Cheshire, CW1 4PP. To supply and install 1No. 30sq. m, stand-alone Modular bay building creating 1No. bay modular building: finished in cedar externally, Modular building to part Land Part M, fully compliant to current building Regs and DfES standards. To design and achieve 1No. classroom, disabled toilet & kitchen area.	Informing future baseline
MA01/464A		Location: Land at Coppenhall Moss, Crewe Land at Coppenhall Moss is allocated for seven permanent Gypsy and Traveller pitches. Development proposals for the site must: 1. retain hedgerows and incorporate a comprehensive landscaping scheme that provides for appropriate boundary treatments; 2. provide for an appropriate visibility splay and access arrangements from Parkers Road/Kent's Lane; 3. demonstrate through a noise impact assessment that external and internal noise impacts can be acceptably minimised through appropriate mitigation; and 4. undertake a phase 1 and 2 contaminated land assessment.	Informing future baseline

- 5.4.29 The following committed developments have been included as part of the future baseline and considered within this assessment:
- the implementation of committed development MA01/448S will result in a new classroom and disabled toilet located immediately to the north of the land required for the construction of the AP1 revised scheme; and

²⁵ Volume 5, Planning Data/Committed Development Map Book: maps CT-13-301 to CT-13-304a-R1.

- the implementation of committed development MA01/464A will result in seven permanent Gypsy and Traveller pitches located adjacent the land required for the construction of the AP1 revised scheme.

Effects arising during construction

Avoidance and mitigation measures

- 5.4.30 No avoidance or mitigation measures, additional to those reported in the main ES and draft CoCP, are required.

Assessment of impacts and effects

- 5.4.31 The amendment will result in a new moderate adverse in-combination effect at approximately 10 residential properties in the vicinity of Warmingham Road and Groby Road. As reported in the main ES, Warmingham Road is a construction traffic route and is expected to experience a significant increase in HGV traffic. This significant HGV traffic effect will combine with new noise and visual effects for approximately one year and six months. Together, these noise, visual and HGV traffic effects will result in a new moderate adverse in-combination effect on amenity for residents at these properties, which is significant.
- 5.4.32 The main ES reported a major adverse in-combination effect on Oakfield Lodge School. Significant noise effects were expected to combine with significant HGV traffic effects for approximately three years and seven months. Alterations to the junction of Warmingham Road and Groby Road (AP1-001-004) will result in a new noise effect on the school building closest to the amendment location for approximately one year and seven months. The amendment will result in new significant visual effects on the school, and the HGV traffic effects reported in the main ES will remain the same. This will result in a different major adverse in-combination effect on Oakfield Lodge School, which is significant.

Other mitigation measures

- 5.4.33 No mitigation measures, additional to those reported in the main ES and draft Code of CoCP, have been identified.

Summary of likely residual significant effects

- 5.4.34 The amendment will result in a new temporary residual effect on approximately 10 residential properties in the vicinity of Warmingham Road and Groby Road as a result of HGV traffic effects and new noise and visual effects.
- 5.4.35 The amendment will result in a different temporary residual effect on Oakfield Lodge school as a result of noise, visual and HGV traffic effects.

Cumulative effects

- 5.4.36 No new, removed or different significant cumulative effects have been identified compared to the main ES.

Health

Scope, assumptions and limitations

- 5.4.37 The assessment scope, key assumptions and limitations for health are as set out in Volume 1 and the SMR of the main ES.
- 5.4.38 This amendment has the potential to result in new different significant construction effects only. Therefore, there is no operational assessment for health.
- 5.4.39 Health effects that result from the assessment of the changes to traffic flows as a result of all AP1 amendments in combination with all SES1 changes are reported in Section 7.

Environmental baseline

Existing environmental baseline

- 5.4.40 The baseline health information is as described in Section 8 of Volume 2, Community Area report: Hough to Walley's Green (MA01) of the main ES. A summary of the baseline information relevant to the assessment of the amendment is provided below.
- 5.4.41 Crewe comprises approximately 30,000 residential properties. The route of the original scheme passes underneath Crewe in tunnel. Crewe has several suburbs including Leighton, Maw Green, Sydney and Coppenhall Moss.
- 5.4.42 Oakfield Lodge School is a pupil referral unit and provides alternative education provision for children who are unable to attend mainstream school. Oakfield Lodge School is located 750m east of the route of the original scheme, and immediately adjacent to land required for this amendment.

Future environmental baseline

- 5.4.43 The Planning data report of the main ES (see Volume 5, Appendix: CT-004-00000 of the main ES) provides details of committed developments assumed to have been implemented by 2025. This information has been supplemented by the committed developments listed in the equivalent Volume 5 Planning data report of the SES1 and AP1 ES (see SES1 and AP1 Volume 5, Appendix: CT-004-00000). These committed developments have been considered as a future baseline where relevant.
- 5.4.44 Committed developments of relevance to the community assessment that would materially alter the future baseline during construction of the AP1 revised scheme in this area, are set out in Table 16.

Table 16: Committed developments of relevance to community during construction

Map book reference ²⁶	Planning reference	Description	How this is considered in the assessment
MA01/448S	21/1598N	Location: Oakfield Lodge School, Warmingham Road, Crewe, Cheshire, CW1 4PP. To supply and install 1No. 30sq. m, stand-alone Modular bay building creating 1No. bay modular building: finished in cedar externally, Modular building to part Land Part M, fully compliant to current building Regs and DfES standards- To design and achieve 1No. classroom, disabled toilet & kitchen area.	Informing future baseline
MA01/464A	n/a	Location: Land at Coppenhall Moss, Crewe Land at Coppenhall Moss is allocated for seven permanent Gypsy and Traveller pitches. Development proposals for the site must: 1. retain hedgerows and incorporate a comprehensive landscaping scheme that provides for appropriate boundary treatments; 2. provide for an appropriate visibility splay and access arrangements from Parkers Road/Kent's Lane; 3. demonstrate through a noise impact assessment that external and internal noise impacts can be acceptably minimised through appropriate mitigation; and 4. undertake a phase 1 and 2 contaminated land assessment.	Informing future baseline

5.4.45 The following committed developments have been included as part of the future baseline and considered within this assessment:

- the implementation of committed development MA01/448S will result in a new classroom and disabled toilet located immediately to the north of the land required for the construction of the SES1 scheme; and
- the implementation of committed development MA01/464A will result in seven permanent Gypsy and Traveller pitches located adjacent the land required for the construction of the SES1 scheme.

Effects arising during construction

Avoidance and mitigation measures

5.4.46 No avoidance or mitigation measures, additional to those reported in the main ES and draft CoCP, are required.

Assessment of impacts and effects

5.4.47 The amendment will result in a new adverse neighbourhood quality effect for residents in the vicinity of Warmingham Road and Groby Road. As reported in the main ES, Warmingham Road is a construction traffic route and is expected to experience a significant increase in

²⁶ Volume 5, Planning Data/Committed Development Map Book: maps CT-13-301 to CT-13-304a-R1.

HGV traffic. This significant HGV traffic effect will combine with new noise and visual effects for approximately 11 months. People in this community are likely to experience these effects as changing the quality of their neighbourhood and to regard that change as adverse, in diminishing the amenity of the settlement.

- 5.4.48 The main ES reported an adverse health effect on Oakfield Lodge School. Warmingham Road was expected to experience a significant increase in HGV traffic movements. Construction works associated with Coppenhall Moss cutting, Coppenhall Moss south embankment and Footpath Crewe 29/1 overbridge were expected to result in significant noise effect for a period of approximately three years and seven months. This amendment will result in a new construction noise effect on the school building closest to the amendment location, as a result of junction modifications for approximately one year and seven months. The amendment will result in new significant visual effects on the school. The HGV traffic effects reported in the main ES will remain the same. This will result in a different health effect on Oakfield Lodge School, which may reduce the beneficial wellbeing effects associated with educational attainment.

Other mitigation measures

- 5.4.49 No mitigation measures, additional to those reported in the main ES and draft CoCP, have been identified.

Cumulative effects

- 5.4.50 No new, removed or different significant cumulative effects have been identified compared to the main ES.

Landscape and visual

Scope, assumptions and limitations

- 5.4.51 The assessment scope, key assumptions and limitations for landscape and visual are as set out in Volume 1 and the SMR of the main ES.
- 5.4.52 This amendment has the potential to result in new or different significant construction and operational visual effects only. Therefore, there are no construction and operational phase landscape assessments.
- 5.4.53 All landscape and visual effects arising from this amendment are reported in SES1 and AP1 ES Volume 5, Appendix: LV-001-0MA01.

Environmental baseline

Existing environmental baseline

- 5.4.54 The baseline landscape and visual information is as described Volume 5, Appendix: LV-001-0MA01 of the main ES. A summary of the baseline information relevant to the assessment of the amendment is provided below.

Visual baseline

- 5.4.55 The amendment has the potential to result in new or different significant effects at two new viewpoints, which were unaffected by the original scheme. These viewpoints are described in the SES1 and AP1 ES, Volume 5, Appendix: LV-001-0MA01 and summarised below.

View north-west from Groby Road (high sensitivity receptors) (304-02-014)

- 5.4.56 This new viewpoint is located in an area where there will be changes from the original scheme and represents the views experienced by residents in properties on Groby Road and road users. The tree lined Groby Road is prominent in the foreground with associated red-brick terraced housing and gardens. The south side of the road is bordered by vegetation in the front gardens of residential properties, alongside the steel palisade boundary fencing to a small bus maintenance depot. The trees and hedgerow on the northern side of the road filter views to the farmland beyond. Trees around the junction of Groby Road and Warmingham Road are visible in longer distance views. A telegraph pole and phone lines are detracting elements in the view.

View east from Footpath Crewe 28/1 (high sensitivity receptors) (304-03-015)

- 5.4.57 This new viewpoint is located in an area where there will be changes from the original scheme and represents the views experienced by users of Footpath Crewe 28/1 and Oakfield Lodge School. There are interrupted views in the near-distance of pasture, hedgerows and scattered field trees. Views are limited by trimmed hedgerows in the middle-distance, which filter views of Warmingham Road, its junction with Groby Road and associated traffic. Roadside trees, aligned with the hedgerows, restrict longer distance views. Overhead power lines and pylons are visible above the vegetation in the middle-distance, which, along with the rooflines of commercial units to the north, are visual detractors within views. Views from Oakfield Lodge School are screened by intervening vegetation.

Future environmental baseline

- 5.4.58 The Planning data report of the main ES (see Volume 5, Appendix: CT-004-00000 of the main ES) provides details of committed developments assumed to have been implemented by 2025. This information has been supplemented by the committed developments listed in the equivalent Volume 5 Planning data report of the SES1 and AP1 ES (see SES1 and AP1 ES Volume 5, Appendix: CT-004-00000). These committed developments have been considered as a future baseline where relevant.

- 5.4.59 None of the identified committed developments will alter the baseline conditions in 2025 or 2038 for landscape or visual amenity.

Effects arising during construction

Avoidance and mitigation measures

- 5.4.60 No mitigation measures additional to those reported in the main ES and draft CoCP are proposed.

Assessment of impacts and effects

Visual assessment

View north-west from Groby Road (high sensitivity receptors) (304-02-014) and View east from Footpath Crewe 28/1 (high sensitivity receptors) (VP 304-03-015)

- 5.4.61 These two new viewpoints are located in an area where there will be changes from the original scheme. Residents, road users and footpath users of **high** susceptibility and with **medium** value views will experience a noticeable change to near and middle-distance views as a result of construction activity associated with the amendment. The removal of existing established roadside trees and hedgerows will open up views of fields and of traffic, including construction traffic, using Warmingham Road. Construction activities will be visible in the near and middle-distance associated with the road modifications. Construction traffic using Groby Road and Warmingham Road will be apparent. The amendment will give rise to a **medium** magnitude of change and a **moderate** adverse (significant) effect. The amendment will therefore give rise to new significant effects.
- 5.4.62 For further information see SES1 and AP1 ES Volume 5, Appendix: LV-001-0MA01.

Other mitigation measures

- 5.4.63 No mitigation measures additional to those reported in the main ES and draft CoCP are proposed.

Summary of likely residual significant effects

- 5.4.64 In many cases, significant effects will reduce over time as the proposed mitigation planting matures and reaches its designed intention. However, the amendment will give rise to new likely residual significant construction effects following implementation of construction phase mitigation, at the following new viewpoints which are located in an area where there will be changes from the original scheme:
- view north-west from Groby Road viewpoint (304-02-014) – the effect will be moderate adverse (significant); and
 - view east from Footpath Crewe 28/1 viewpoint (304-03-015) – the effect will be moderate adverse (significant).

Cumulative effects

- 5.4.65 No new, removed or different significant cumulative effects have been identified compared to the main ES.

Effects arising during operation

Avoidance and mitigation measures

- 5.4.66 No mitigation measures additional to those reported in the main ES are proposed.

Assessment of impacts and effects

Visual assessment

View north-west from Groby Road (high sensitivity receptors) (304-02-014) and View east from Footpath Crewe 28/1 (high sensitivity receptors) (VP 304-03-015)

- 5.4.67 These new viewpoints are located in an area where there will be changes from the original scheme. At year 1, residents, road users and footpath users of **high** susceptibility and with **medium** value views, will experience a noticeable change to views. Vegetation clearance and changes to the highway design associated with the amendment will result in greater visibility of traffic movements in the near and middle distance. Established roadside trees and hedges removed during construction will have been replaced; however, these will not contribute towards the integration of the change to the highway infrastructure or provide screening in year 1 a result of their immaturity. The amendment will give rise to a **medium** magnitude of change and a **moderate** adverse (significant) effect. The amendment will therefore give rise to a new significant effect.
- 5.4.68 At year 15 and 30, the level of significance of the effect will be non-significant as reported in the main ES due to the growth of mitigation planting and increase in effective screening.

Other mitigation measures

- 5.4.69 No mitigation measures additional to those reported in the main ES are proposed.

Summary of likely residual significant effects

- 5.4.70 No residual significant effects are anticipated as a result of the amendment.

Cumulative effects

- 5.4.71 No new, removed or different significant cumulative effects have been identified compared to the main ES.

Sound, noise and vibration

Scope, assumptions and limitations

- 5.4.72 The assessment scope, key assumptions and limitations for sound, noise and vibration are as set out in Volume 1 and the SMR of the main ES. This amendment has the potential to result in new or different likely significant construction effects only. Therefore, there is no assessment of operational effects for sound, noise and vibration.
- 5.4.73 Sound, noise and vibration effects that result from the assessment of the changes to traffic flows as a result of all AP1 amendments in combination with all SES1 changes are reported in Section 7.

Environmental baseline

Existing environmental baseline

- 5.4.74 In the Hough to Walley's Green area, the updated sound modelling described in Section 2 has resulted in updates to the existing baseline sound levels at receptors adjacent to Broughton Road and in the community of Copenhall. Further information on the updated baseline sound levels relevant to the assessment is provided in the SES1 and AP1 ES Volume 5, Appendix: SV-002-00000. Where no updates to the baseline sound levels are required, the baseline sound, noise and vibration information is as described in Section 13 of Volume 2, Community Area report: Hough to Walley's Green (MA01) of the main ES.
- 5.4.75 Baseline sound levels representative of the assessment locations affected by this amendment have been used in the construction noise assessment.

Future environmental baseline

- 5.4.76 The Planning data report of the main ES (see Volume 5, Appendix: CT-004-00000 of the main ES) provides details of committed developments assumed to have been implemented by 2025. This information has been supplemented by the committed developments listed in the equivalent Volume 5 Planning data report of the SES1 and AP1 ES (see SES1 and AP1 ES Volume 5, Appendix: CT-004-00000). These committed developments have been considered as a future baseline where relevant.
- 5.4.77 The developments have been considered to determine whether they would result in a material change to the future baseline or have the potential to give rise to cumulative effects. Committed developments of relevance to the community assessment that would materially alter the future baseline during construction of the amendment in this area, are set out in Table 17.

Table 17: Committed developments relevant to sound, noise and vibration

Map book reference ²⁷ (SNV Assessment location ref.)	Planning reference	Description	How this is considered in the assessment
MA01/448S (610678)	21/1598N	Location: Oakfield Lodge School, Warmingham Road, Crewe, Cheshire, CW1 4PP. To supply and install 1No. 30sq. m, standalone Modular bay building creating 1No. bay modular building: finished in cedar externally, Modular building to part Land Part M, fully compliant to current building Regs and DfES standards. To design and achieve 1No. classroom, disabled toilet & kitchen area.	Informing future baseline (construction)

5.4.78 Updates have also been made to future baseline sound levels at the locations identified in the existing baseline section above where updates to the existing baseline sound levels have been made for the SES1 and AP1 ES.

Effects arising during construction

Avoidance and mitigation measures

5.4.79 No avoidance or mitigation measures, additional to those reported in the main ES and draft CoCP, are required.

Assessment of impacts and effects

Residential receptors: direct effects – communities

5.4.80 The amendment has the potential to give rise to new temporary direct adverse noise effects, which may be considered to be significant on a community basis. The potential new or different likely significant effects are discussed in the following paragraphs and summarised in Table 18. In the table, the duration of impact is the period where the relevant assessment category is exceeded. The predicted monthly construction noise level will vary throughout this period and as a guide the typical and highest monthly noise levels at the closest dwellings in the community identified are presented in the ‘cause’ column of this table.

5.4.81 The amendment has the potential to give rise to a new adverse noise effect at approximately 10 dwellings in the vicinity of the junction of Warmingham Road and Groby Road at Copenhall Moss (MA01-C-C11) where no noise effect was identified in the main ES. The predicted duration of the construction noise impact is up to one year and six months during the daytime. This may be considered by the local community as an effect on the acoustic character of the area and hence be perceived as a change in the quality of life for that community. This is considered to be a likely significant effect when assessed on a community basis.

²⁷ Volume 5, Planning Data/Committed Development Map Book: map CT-13-303.

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Table 18: Direct adverse construction effects on residential communities and shared open areas that are considered to be significant on a community basis and are new or different to those reported in the main ES

Significant effect number (and map reference) ²⁸	Type of significant effect	Time of day	Location	Cause (construction activities) ²⁹	Assumed approximate duration of impact
MA01-C-C11 (SV-03-303)	Construction noise (New)	Daytime	Coppenhall Moss: approximately 10 dwellings in the vicinity of the junction of Warmingham Road and Groby Road.	During the daytime, general site works in the vicinity of the junction of Warmingham Road and Groby Road. The typical and highest monthly noise levels will both be approximately 70dB to 75dB ³⁰ .	Up to one year and six months.

²⁸ See SES1 and AP1 ES Volume 5, Appendix: SV-002-00000, Sound, noise and vibration report and Volume 5, Map Book SV-03.

²⁹ The construction activity giving rise to the highest predicted noise or vibration level is reported. Multiple construction activities may contribute to the typical noise levels and the approximate duration of impact.

³⁰ Equivalent continuous sound level at the facade, $L_{pAeq, 0700-1900}$.

- 5.4.82 For further information see SES1 and AP1 ES Volume 5, Appendix: SV-002-00000 and SES1 and AP1 ES Volume 5: Sound, noise and vibration Map Book.

Non-residential receptors: direct effects

- 5.4.83 The main ES identified a significant effect as a result of construction noise at Oakfield Lodge School. This was denoted as MA01-C-N9 in the Volume 2, Community Area report: Hough to Walley's Green (MA01), in Volume 5, Appendix: SV-002-0MA01 and the Volume 5, Sound, noise and vibration Map Book, Map Series SV-03 in the main ES. The amendment will give rise to a different likely significant direct construction effect at Oakfield Lodge School, Warmingham Road, Crewe (assessment location ref.: 610678 and 610979).
- 5.4.84 The Oakfield Lodge School receptor also includes a committed development (MA01/448S), which comprises a single bay modular building containing a single classroom, kitchen facility and WC. The building will be located within the school grounds and will be an insulated steel and timber frame construction with double glazed windows. The amendment will give rise to a predicted daytime monthly construction noise level that is above the screening criterion defined in the SMR for educational use³¹ for a period of one year and seven months. The highest predicted daytime monthly construction noise levels at the school building nearest the proposed construction works are 11dB above the screening criterion defined in the SMR. The predicted typical monthly daytime construction noise levels are 9dB above the screening criterion defined in the SMR. Oakfield Lodge School is identified, on the basis of a precautionary assessment, as being subject to a likely different significant adverse effect (denoted by MA01-C-N9). This different temporary adverse effect may take the form of activity disturbance during the daytime to users of Oakfield Lodge School.

Other mitigation measures

- 5.4.85 No mitigation measures additional to those reported in the main ES and draft CoCP are required.

Summary of likely residual significant effects

- 5.4.86 A new temporary residual adverse significant noise effect from construction activities on the residential community of Coppenhall Moss is likely as a result of the amendment.
- 5.4.87 Different temporary residual adverse significant noise effects from construction activities on the non-residential buildings at Oakfield Lodge School, Warmingham Road are likely as a result of the amendment.

Cumulative effects

- 5.4.88 No new, removed or different significant cumulative effects have been identified compared to the main ES.

³¹ 50dB L_{pAeq,0700-2300} (free-field) during the day, which is equivalent to 53dB L_{pAeq,0700-2300} (façade).

Summary of new or different likely residual significant effects as a result of the amendment

Construction

Community

- 5.4.89 The amendment will result in a new temporary residual effect on approximately 10 residential properties in the vicinity of Warmingham Road and Groby Road as a result of HGV traffic effects and new noise and visual effects.
- 5.4.90 The amendment will result in a different temporary residual effect on Oakfield Lodge school as a result of noise, visual and HGV traffic effects.

Landscape and visual

- 5.4.91 In many cases, significant effects will reduce over time as the proposed mitigation planting matures and reaches its designed intention. However, the amendment will give rise to new likely residual significant construction effects following implementation of construction phase mitigation, at the following new viewpoints which are located in an area where there will be changes from the original scheme:
- view north-west from Groby Road viewpoint (304-02-014) – the effect will be moderate adverse (significant); and
 - view east from Footpath Crewe 28/1 viewpoint (304-03-015) – the effect will be moderate adverse (significant).

Sound, noise and vibration

- 5.4.92 A new temporary residual adverse significant noise effect from construction activities on the residential community of Coppenthal Moss is likely as a result of the amendment.
- 5.4.93 Different temporary residual adverse significant noise effects from construction activities on the non-residential buildings at Oakfield Lodge School, Warmingham Road are likely as a result of the amendment.

5.5 Change to Bill powers required for the relocation of an access point and realignment of Hoggins Brook at Moss Lane (AP1-001-005)

- 5.5.1 The Bill provides for a HS2 attenuation pond and a trackside laydown area, located at Moss Lane, Crewe. An existing track to a Network Rail road rail access point (RRAP) at this location would be resurfaced and widened, with a turning area for vehicles to provide access to the pond and laydown area (see Volume 2, MA01 Map Book, map CT-06-306, E2 to F6 in the

main ES). To accommodate these provisions, and nearby landscape earthworks, Hoggins Brook watercourse would be realigned by 1.8km.

- 5.5.2 Since the main ES, engagement with Network Rail has identified the requirement to relocate the existing RRAP at Moss Lane. The RRAP will be reinstated 180m further north, adjacent to the new laydown area. A trackside hardstanding area will be provided as part of the relocated RRAP. The RRAP hardstanding area will be located adjacent to the WCML and will be 34m by 14m.
- 5.5.3 To provide access to the reinstated RRAP, the existing access track from Moss Lane will be extended to the west of, and adjacent to, the WCML. The extended access track will incorporate a passing place, suitable for large vehicles, between the attenuation pond and the RRAP.
- 5.5.4 As part of this amendment, the following modifications will be required:
- a minor change to the footprint of the landscape earthworks which run parallel to the west of the WCML;
 - introduction of a ditch to channel runoff from the landscape earthworks to Hoggins Brook; and
 - a change to the realignment of Hoggins Brook watercourse to follow the base of the revised landscape earthworks. The realigned watercourse will maintain a suitable hydraulic gradient and profile, similar to the existing watercourse, ensuring suitable flow conditions. This change in the realignment reduces the overall realignment of Hoggins Brook to 1.7km.
- 5.5.5 The amendment will be constructed within the indicative construction programme set out in the main ES.
- 5.5.6 The amendment will require a change to Bill powers (see SES1 and AP1 ES Volume 2, MA01 Map Book: maps CT-06-306, E5 and CT-06-306, B9).

Topics included in the AP1 assessment

- 5.5.7 The assessment of this AP1 amendment has identified new, different or removed likely significant effects for the following topics: landscape and visual.
- 5.5.8 The assessment of the changes to construction traffic flows and traffic related effects as a result of this amendment in combination with all SES1 changes and AP1 amendments, is reported in Section 7. Topics where a significant effect has been identified due to changes to traffic flows are reported in Section 7 and include air quality.

Landscape and visual

Scope, assumptions and limitations

- 5.5.9 The assessment scope, key assumptions and limitations for landscape and visual are as set out in Volume 1 and the SMR of the main ES.
- 5.5.10 The amendment has the potential to give rise to new or different significant operational visual effects only. Therefore, there are no construction or operational phase landscape assessments and no construction phase visual assessment.
- 5.5.11 All landscape and visual effects arising from this amendment are reported in SES1 and AP1 ES Volume 5, Appendix: LV-001-0MA01.

Environmental baseline

Existing environmental baseline

- 5.5.12 The baseline landscape and visual information is as described Volume 5, Appendix: LV-001-0MA01 of the main ES. A summary of the baseline information relevant to the assessment of the amendment is provided below.

Visual baseline

- 5.5.13 The amendment has the potential to significantly affect two viewpoints, which are described in the SES1 and AP1 ES, Volume 5, Appendix: LV-001-0MA01 and summarised below.

View east from Moss Lane, Crewe and Nantwich Circular Walk (high sensitivity receptors) (304-02-006)

- 5.5.14 This viewpoint represents the views experienced by residents of Moss Lane and users of Footpath Leighton 7/1 and Crewe Footpath 12/1 (part of Crewe and Nantwich Circular Walk). It is located on Moss Lane to the north of Crewe and west of the WCML. In the middle distance and beyond Moss Lane are rectilinear fields of semi-improved pasture, bordered by managed hedgerows with occasional hedgerow trees. A mature woodland belt screens properties in Leighton to the south, while intermittent overgrown hedges and small woodlands including Spring Plantation are present in views to the north. Pylons and a wind turbine are noticeable features along with the WCML. The Peak District is visible in the far distance to the east.

View east from Footpath Minshull Vernon 2/1, east of Moss Lane (high sensitivity receptors) (Viewpoint 304-02-009)

- 5.5.15 This viewpoint represents the views experienced by residents of Spring Farm, properties east of Moss Lane and by users of Footpath Minshull Vernon 2/1. There are filtered views of arable fields with an overhead power line featuring prominently. The WCML, including overhead line equipment and a pedestrian footbridge, is visible in the middle distance

although partially screened by mature vegetation. The distant skyline comprises mature hedgerows, plantations and a line of poplar trees.

Future environmental baseline

- 5.5.16 The Planning data report of the main ES (see Volume 5, Appendix: CT-004-00000 of the main ES) provides details of committed developments assumed to have been implemented by 2025. This information has been supplemented by the committed developments listed in the equivalent Volume 5 Planning data report of the SES1 and AP1 ES (see SES1 and AP1 ES Volume 5, Appendix: CT-004-00000). These committed developments have been considered as a future baseline where relevant.
- 5.5.17 None of the identified committed developments will alter the baseline conditions in 2025 or 2038 for landscape or visual amenity.

Effects arising during operation

Avoidance and mitigation measures

- 5.5.18 No mitigation measures additional to those reported in the main ES are proposed.

Assessment of impacts and effects

Visual assessment

View east from Moss Lane, Crewe and Nantwich Circular Walk (high sensitivity receptors) (304-02-006)

- 5.5.19 At year 1, the main ES reported a **major** adverse (significant) effect for residents of Moss Lane and users of Footpath Leighton 7/1 and Crewe Footpath 12/1 (part of Crewe and Nantwich Circular Walk of high susceptibility and with **medium** value views experiencing a substantial change to the composition of near and middle-distance views. This would be due to the presence of Warrington Moss southbound and northbound viaducts, associated train movements and overhead line equipment, which would interrupt the skyline across much of the view.
- 5.5.20 At year 1, the amendment will result in a small reduction in the extent of the landscape mitigation earthworks, increasing the visibility of the moving trains on the embankments and viaducts in a small proportion of near-distance views for users of the footpath. However, the change will not be readily discernible for residents of properties along Moss Lane. Therefore, the amendment will give rise to a different effect; however, the level of significance of the effect will remain as reported in the main ES.
- 5.5.21 At year 15 and 30, the level of significance of the effects will remain **moderate** adverse (significant), as reported in the main ES, due to maturing mitigation planting in association with landscape earthworks will assist in the visual integration of the AP1 revised scheme.

View east from Footpath Minshull Vernon 2/1, east of Moss Lane (high sensitivity receptors) (Viewpoint 304-02-009)

- 5.5.22 At year 1, the main ES reported a **major** adverse (significant) effect for residents of Spring Farm, properties east of Moss Lane and by users of Footpath Minshull Vernon 2/1 of high susceptibility and with **medium** value views. This would be due to the presence of Warmingham Moss southbound viaduct and Warmingham Moss northbound viaduct, along with train movements and the presence of overhead line equipment.
- 5.5.23 At year 1, the amendment will change the visual effect at this viewpoint. The amendment will result in a small reduction in the extent of the landscape mitigation earthworks, increasing the visibility of moving trains on the embankments and viaducts in a small proportion of middle-distance views for users of Footpath Minshull Vernon 2/1. The change will not be readily discernible for residents of Spring Farm and properties east of Moss Lane as intervening vegetation will partially filter views. Therefore, the amendment will give rise to a different effect; however, the level of significance of the effect will remain as reported in the main ES.
- 5.5.24 At year 15 and 30, the level of significance of the effects will remain **moderate** adverse (significant), as reported in the main ES, due to maturing mitigation planting in association with landscape earthworks will assist in the visual integration of the scheme.
- 5.5.25 For further information see SES1 and AP1 ES, Volume 5, Appendix: LV-001-0MA01.

Other mitigation measures

- 5.5.26 No mitigation measures additional to those reported in the main ES are proposed.

Summary of likely residual significant effects

- 5.5.27 There are no new or different likely significant residual operational effects as a result of the amendment.

Cumulative effects

- 5.5.28 No new, removed or different significant cumulative effects have been identified compared to the main ES.

Summary of new or different likely residual significant effects as a result of the amendment

- 5.5.29 The amendment will not result in any new or different residual significant effects.

5.6 Additional land permanently required for the provision of landscape earthworks adjacent to Footpath Minshull Vernon 8/1 accommodation overbridge (AP1-001-006)

5.6.1 The Bill provides for:

- landscape earthworks on the north-eastern embankment of Footpath Minshull Vernon 8/1 accommodation overbridge and Parkfield Farm access realignment;
- an area of ecological mitigation in the form of woodland habitat creation at the base of the slope; and
- a HS2 maintenance access, to the east of the AP1 revised scheme, at the bottom of the landscape earthworks adjacent to Footpath Minshull Vernon 8/1 accommodation overbridge.

5.6.2 These measures were included to provide replacement habitat and maintenance access and to integrate the original scheme into the surrounding landscape (see Volume 2, MA01 Map Book, map CT-06-307, G7 to H6, in the main ES).

5.6.3 Since the main ES, the landscape earthworks in this location have been redesigned to better integrate the Footpath Minshull Vernon 8/1 accommodation overbridge into the surrounding landscape.

5.6.4 Landscape earthworks will be provided on the north-eastern embankment of Footpath Minshull Vernon 8/1 accommodation overbridge and the realigned Parkfield Farm access. These landscape earthworks will be less steep than proposed in the main ES to help integrate the Footpath Minshull Vernon 8/1 accommodation overbridge into the surrounding landscape and further screen views from footpaths and residential properties to the east and north.

5.6.5 The proposed HS2 maintenance access route, included within the original scheme, will be realigned to follow the bottom of the new landscape earthworks. There will also be an area of woodland habitat creation at the bottom of the slope.

5.6.6 Material for the landscape earthworks will be transported from Crewe tunnel to Crewe North rolling stock depot (RSD) via conveyor belt, as set out in the main ES. Following treatment, it will be taken to the landscape mitigation earthworks location via site haul route.

5.6.7 The works associated with this amendment will be constructed within the indicative construction programme set out in the main ES.

5.6.8 The land required for these landscape earthworks is outside the limits of the Bill. The amendment will result in the permanent requirement for an additional 2.5ha of land (see SES1 and AP1 ES Volume 2, MA01 Map Book: map CT-06-307, G7 to H7).

Local alternatives

- 5.6.9 The SES1 and AP1 ES Alternatives report (see SES1 and AP1 ES Volume 5, Appendix: CT-003-00000) describes the local alternatives considered as part of the design development of this amendment.

Topics included in the AP1 assessment

- 5.6.10 The assessment of this AP1 amendment has identified new, different or removed likely significant effects for the following topics: landscape and visual.
- 5.6.11 The assessment of the changes to construction traffic flows and traffic related effects as a result of this amendment in combination with all SES1 changes and AP1 amendments, is reported in Section 7. Topics where a significant effect has been identified due to changes to traffic flows are reported in Section 7 and include air quality.

Landscape and visual

Scope, assumptions and limitations

- 5.6.12 The assessment scope, key assumptions and limitations for landscape and visual are as set out in Volume 1 and the SMR of the main ES.
- 5.6.13 This amendment has the potential to result in new or different significant operational visual effects only. Therefore, there are no construction or operational phase landscape assessments and no construction phase visual assessment.
- 5.6.14 All landscape and visual effects arising from this amendment are reported in SES1 and AP1 ES Volume 5, Appendix: LV-001-0MA01.

Environmental baseline

Existing environmental baseline

- 5.6.15 The baseline landscape and visual information is as described in the Volume 5, Appendix: LV-001-0MA01 of the main ES. A summary of the baseline information relevant to the assessment of the amendment is provided below.

Visual baseline

- 5.6.16 The amendment has the potential to affect two viewpoints, which are described in the SES1 and AP1 ES, Volume 5, Appendix: LV-001-0MA01. Of these, the amendment has the potential to significantly affect one viewpoint which is summarised below.

View west from Footpath Minshull Vernon 8/1 at Park House Farm (high sensitivity receptors) (305-02-005)

- 5.6.17 This viewpoint represents the views experienced by residents of Park House Farm, Park Hall Farm, Parkfield Farm and by users of Footpath Minshull Vernon 8/1. The viewpoint is located on Footpath Minshull Vernon 8/1 east of WCML between Wimboldsley and Minshull Vernon. In the near distance is a farm access track crossing pastoral farmland bounded by post and rail fencing. In the middle-distance land rises gently to the north-west, with hedged fields and numerous field and hedgerow trees. To the north-west, a small copse partially screens a pond next to Park House Farm. The house and farm buildings are partially screened by boundary vegetation closing the view beyond. The property at Parkfield Farm, immediately to the west of the WCML, has close and direct views east over the railway. In the far distance a network of field boundary hedges forms the skyline with filtered views of gantries and overhead line equipment on WCML.

Future environmental baseline

- 5.6.18 The Planning data report of the main ES (see Volume 5, Appendix: CT-004-00000 of the main ES) provides details of committed developments assumed to have been implemented by 2025. This information has been supplemented by the committed developments listed in the equivalent Volume 5 Planning data report of the SES1 and AP1 ES (see SES1 and AP1 ES Volume 5, Appendix: CT-004-00000). These committed developments have been considered as a future baseline where relevant.
- 5.6.19 None of the identified committed developments will alter the baseline conditions in 2025 or 2038 for landscape or visual amenity.

Effects arising during operation

Avoidance and mitigation measures

- 5.6.20 No mitigation measures additional to those reported in the main ES are required.

Assessment of impacts and effects

Visual assessment

View west from Footpath Minshull Vernon 8/1 at Park House Farm (high sensitivity receptors) (305-02-005)

- 5.6.21 At year 1, the main ES reported a **moderate** adverse (significant) effect for users of Footpath Minshull Vernon 8/1 and residents of Park House and Park Hall Farm of **high** susceptibility and with **medium** value views experiencing a notable change to the composition of near and middle-distance. This would be due to the presence of Footpath Minshull Vernon 8/1 accommodation overbridge and A530 Nantwich Road overbridge.

- 5.6.22 At year 1, the amendment will change the visual effect at this viewpoint. The footprint of the north-east embankment slope of the Footpath Minshull Vernon 8/1 accommodation overbridge will be increased reducing the local slope profile which will be perceptible for users of the footpath, locally improving the visual integration of the overbridge earthworks. At year 1 mitigation planting will not provide any additional screening. The localised nature of the amendment, viewed in the context of the large-scale structures of the original scheme, will result in a minimal change in the view. Therefore, the amendment will give rise to a different significant effect; however, the level of significance of the effect will remain as reported in the main ES.
- 5.6.23 At year 15 and 30, the level of significance of the effect will remain non-significant as reported in the main ES due to the growth of mitigation planting and increase in effective screening.
- 5.6.24 For further information see SES1 and AP1 ES Volume 5, Appendix: LV-001-0MA01.

Other mitigation measures

- 5.6.25 No mitigation measures additional to those reported in the main ES are proposed.

Summary of likely residual significant effects

- 5.6.26 There are no new or different likely significant residual effects reported as a result of the amendment.

Cumulative effects

- 5.6.27 No new, removed or different significant cumulative effects have been identified compared to the main ES.

Summary of new or different likely residual significant effects as a result of the amendment

- 5.6.28 The amendment will not result in any new or different residual significant effects.

5.7 Additional land permanently required for the provision of landscape earthworks adjacent to Coppenhall Moss north embankment (AP1-001-007)

- 5.7.1 The Bill provides for an area of landscape mitigation planting along the eastern side of the HS2 route, to the west of Park Hall Farm, to help integrate the HS2 route into the surrounding landscape (see Volume 2, MA01 Map Book, map CT-06-307, H7 to map CT-06-308a, D7 in the main ES).

- 5.7.2 Since the main ES, further consideration has been given to reducing the visual impact at Park Hall Farm, for users of Footpath Minshull Vernon 8/1 and residential receptors to the east. Additional land adjacent to the eastern side of Coppenhall Moss north embankment will be permanently required for landscape earthworks. The landscape earthworks will be created to the east of the HS2 route and to the west of Park Hall Farm, for the purposes of visual mitigation and in response to local community feedback regarding airborne noise. The landscape earthworks will be approximately 300m long and up to 2m in height (see SES1 and AP1 ES Volume 2, MA01 Map Book: map CT-06-308a, B7 to D7).
- 5.7.3 The landscape mitigation planting described in the main ES will remain and there will be further planting on the landscape earthworks.
- 5.7.4 The amendment will be constructed within the indicative construction programme set out in the main ES.
- 5.7.5 The land required for this amendment is outside the limits of the Bill. The amendment will result in the permanent requirement for an additional 0.3ha of land (see SES1 and AP1 ES Volume 2, MA01 Map Book: map CT-06-308a, B7 to D7).

Local alternatives

- 5.7.6 The SES1 and AP1 Alternatives report (see SES1 and AP1 ES Volume 5, Appendix: CT-003-00000) describes the local alternatives considered as part of the design development of this amendment.

Topics included in the AP1 assessment

- 5.7.7 The assessment of this AP1 amendment has identified new, different or removed likely significant effects for the following topics: landscape and visual; and sound, noise and vibration.
- 5.7.8 The assessment of the changes to construction traffic flows and traffic related effects as a result of this amendment in combination with all SES1 changes and AP1 amendments, is reported in Section 7. Topics where a significant effect has been identified due to changes to traffic flows are reported in Section 7 and include air quality.

Landscape and visual

Scope, assumptions and limitations

- 5.7.9 The assessment scope, key assumptions and limitations for landscape and visual are as set out in Volume 1 and the SMR of the main ES.
- 5.7.10 This amendment has the potential to result in new or different significant operational visual effects only. Therefore, there are no construction or operational phase landscape assessments and no construction phase visual assessment.

- 5.7.11 All visual effects, arising from this amendment, are reported in the SES1 and AP1 ES Volume 5, Appendix: LV-001-0MA01.

Environmental baseline

Existing environmental baseline

- 5.7.12 The baseline landscape and visual information is as described in the Volume 5, Appendix: LV-001-0MA01 of the main ES. A summary of the baseline information relevant to the assessment of the amendment is provided below.

Visual baseline

- 5.7.13 The amendment has the potential to significantly affect one viewpoint, which is described in the SES1 and AP1 ES Volume 5, Appendix: LV-001-0MA01 and summarised below.

View west from Footpath Minshull Vernon 8/1 at Park House Farm (high sensitivity receptors) (305-02-005)

- 5.7.14 This viewpoint represents the views experienced by residents of Park House Farm, Park Hall Farm, Parkfield Farm and by users of Footpath Minshull Vernon 8/1. The viewpoint is located on Footpath Minshull Vernon 8/1 east of WCML between Wimboldsley and Minshull Vernon. In the near distance is a farm access track crossing pastoral farmland bounded by post and rail fencing. In the middle-distance land rises gently to the north-west, with hedged fields and numerous field and hedgerow trees. To the north-west, a small copse partially screens a pond next to Park House Farm. The house and farm buildings are partially screened by boundary vegetation closing the view beyond. The property at Parkfield Farm, immediately to the west of the WCML has close and direct views east over the railway. In the far distance a network of field boundary hedges forms the skyline with filtered views of gantries and overhead line equipment associated with the WCML.

Future environmental baseline

- 5.7.15 The Planning data report of the main ES (see Volume 5, Appendix: CT-004-00000 of the main ES) provides details of committed developments assumed to have been implemented by 2025. This information has been supplemented by the committed developments listed in the equivalent Volume 5 Planning data report of the SES1 and AP1 ES (see SES1 and AP1 ES Volume 5, Appendix: CT-004-00000). These committed developments have been considered as a future baseline where relevant.
- 5.7.16 None of the identified committed developments affect the assessment of the AP1 revised scheme's likely impacts on landscape and visual.

Effects arising during operation

Avoidance and mitigation measures

- 5.7.17 No mitigation measures additional to those reported in the main ES are proposed.

Assessment of impacts and effects

Visual assessment

View west from Footpath Minshull Vernon 8/1 at Park House Farm (high sensitivity receptors) (305-02-005)

- 5.7.18 At year 1, the main ES reported a **moderate** adverse (significant) effect for users of Footpath Minshull Vernon 8/1 and residents of Park House and Park Hall Farm of **high** susceptibility and with **medium** value views experiencing a notable change to the composition of near and middle-distance. This would be due to the presence of Footpath Minshull Vernon 8/1 accommodation overbridge and A530 Nantwich Road overbridge.
- 5.7.19 At year 1, the amendment will change the visual effect at this viewpoint, because it includes an embankment improving the landscape integration and screening of Coppenhall Moss north embankment and Walley's Green embankment. In addition, the earthworks will screen train movements along the embankment for receptors in proximity to the scheme notably residents of Park Hall Farm. However, at year 1 mitigation planting will not provide any additional screening. The localised nature of the amendment, viewed in the context of the large-scale structures of the original scheme, will result in a slight change in the view. Therefore, the amendment will give rise to a different significant effect; however, the level of significance of the effect will remain as reported in the main ES.
- 5.7.20 At year 15 and 30, the level of significance of the effect will remain non-significant as reported in the in ES due to the growth of mitigation planting and increase in effective screening.

Other mitigation measures

- 5.7.21 No mitigation measures additional to those reported in the main ES are proposed.

Summary of likely residual significant effects

- 5.7.22 There are no new or different likely significant residual effects reported as a result of the amendment.

Cumulative effects

- 5.7.23 No new, removed or different significant cumulative effects have been identified compared to the main ES.

Sound, noise and vibration

Scope, assumptions and limitations

- 5.7.24 The assessment scope, key assumptions and limitations for sound, noise and vibration are as set out in Volume 1 and the SMR of the main ES. This amendment has the potential to result in new or different likely significant operational effects only. Therefore, there is no construction assessment for sound, noise and vibration.
- 5.7.25 Sound, noise and vibration effects that result from the assessment of the changes to traffic flows as a result of all AP1 amendments in combination with all SES1 changes are reported in Section 7.

Environmental baseline

Existing environmental baseline

- 5.7.26 In the Hough to Walley's Green area, the updated sound modelling described in Section 2 has resulted in updates to the existing baseline sound levels at receptors adjacent to Broughton Road and in the community of Copenhall. Further information on the updated baseline sound levels relevant to the assessment is provided in the SES1 and AP1 ES Volume 5, Appendix: SV-002-00000. Where no updates to the baseline sound levels are required, the baseline sound, noise and vibration information is as described in Section 13 of Volume 2, Community Area report: Hough to Walley's Green (MA01) of the main ES.
- 5.7.27 Baseline sound levels representative of the assessment locations affected by this amendment have been used in the operational noise assessment.

Future environmental baseline

- 5.7.28 The Planning data report of the main ES (see Volume 5, Appendix: CT-004-00000 of the main ES) provides details of committed developments assumed to have been implemented by 2025. This information has been supplemented by the committed developments listed in the equivalent Volume 5 Planning data report of the SES1 and AP1 ES (see SES1 and AP1 Volume 5, Appendix: CT-004-00000). These committed developments have been considered as a future baseline where relevant.
- 5.7.29 The developments have been considered to determine whether they would result in a material change to the future baseline or have the potential to give rise to cumulative effects. None of the identified developments affect the assessment of sound, noise and vibration for the AP1 revised scheme.
- 5.7.30 Updates have also been made to future baseline sound levels at the locations identified in the existing baseline section above where updates to the existing baseline sound levels have been made for the SES1 and AP1 ES.

Effects arising during operation

Avoidance and mitigation measures

- 5.7.31 No avoidance or mitigation measures, additional to those reported in the main ES, are required.

Assessment of impacts and effects

- 5.7.32 The main ES identified the dwelling at Park Hall Farm, Wimboldsley, Middlewich and committed development (Map Book ref.: MA01/145) (assessment location ref.: 610162) as a location where noise levels are predicted to exceed the daytime trigger threshold set out in the NI Regulations. The mitigation measures, set out in the main ES, including noise insulation, will reduce noise inside all dwellings such that it will not reach a level where it will significantly affect residents. The amendment will reduce the airborne noise level at this property to below the daytime trigger threshold set out in the NI Regulations. The night-time noise level is not predicted to exceed the WHO's Interim Target of 55dB and the maximum noise level as a train passes is not predicted to exceed the relevant criteria³². It is anticipated, therefore, that this building will no longer qualify or need to be offered noise insulation as described previously the main ES due to the amendment.

Other mitigation measures

- 5.7.33 No other mitigation measures are required in addition to those reported in the main ES.

Summary of likely residual significant effects

- 5.7.34 There are no new or different significant operational effects for sound, noise or vibration as a result of the amendment, compared to the main ES.

Cumulative effects

- 5.7.35 No new, removed or different significant cumulative effects have been identified compared to the main ES.

Summary of new or different likely residual significant effects as a result of the amendment

- 5.7.36 The amendment will not result in any new or different residual significant effects.

³² During the night (2300-0700) a significant effect is also identified where the AP1 revised scheme results in a maximum sound level at the façade of a building at or above: 85dB L_{pAFmax} (where the number of train pass-bys exceeding this value is less than or equal to 20); or 80dB L_{pAFmax} (where the number of train pass-bys exceeding this value is greater than 20).

6 Construction programme

6.1 Introduction

- 6.1.1 The AP1 revised scheme has resulted in the need to alter the indicative construction programme as set out in the main ES.
- 6.1.2 The revised indicative programme is shown Figure 3.

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Figure 3: Indicative construction programme

Hough to Walley's Green	2025 Quarters				2026 Quarters				2027 Quarters				2028 Quarters				2029 Quarters				2030 Quarters				2031 Quarters				2032 Quarters				2033 Quarters				2034 Quarters				2035 Quarters													
Construction activity	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4										
Area Advance Works (MA01)	█																																																					
Crewe Tunnel South Portal satellite compound (HBD)																	█																																					
Crewe Tunnel South Portal satellite compound (AP1)																	█																																					
Site preparation and setup																	█		█		█																																	
Crewe Tunnel South porous portal																	█		█				█				█				█																							
Crewe Tunnel South portal building																					█		█				█				█																							
Crewe Tunnel South portal telecommunications site (civil works)																							█		█																													
Crewe Tunnel South portal telecommunications site (rail systems works)																							█		█																													
Rail systems - tunnel building works																									█		█		█																									
Rail systems - track works																											█		█		█		█																					
Rail systems - tunnel systems																													█		█		█																					
Site reinstatement																											█		█		█		█																					

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Hough to Walley's Green	2025 Quarters	2026 Quarters	2027 Quarters	2028 Quarters	2029 Quarters	2030 Quarters	2031 Quarters	2032 Quarters	2033 Quarters	2034 Quarters	2035 Quarters
Cowley Way Vent Shaft satellite compound (HBD)											
Cowley Way Vent Shaft satellite compound (AP1)											
Site preparation and setup											
Cowley Way vent shaft											
Cowley Way auto-transformer station (civil works)											
Cowley Way auto-transformer station (rail systems works)											
Rail systems - vent shaft works											
Site reinstatement											
Middlewich Street Vent Shaft satellite compound (HBD)											
Middlewich Street Vent Shaft satellite compound (AP1)											
Site preparation and setup											
Middlewich street vent shaft											
Rail systems installation - vent shaft works											
Site reinstatement											

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Hough to Walley's Green	2025 Quarters	2026 Quarters	2027 Quarters	2028 Quarters	2029 Quarters	2030 Quarters	2031 Quarters	2032 Quarters	2033 Quarters	2034 Quarters	2035 Quarters
Crewe Tunnel North main compound (HBD)											
Crewe Tunnel North main compound (AP1)											
Crewe Tunnel North portal - advance works											
Utilities (major)											
Public Combined Water Sewerage Pumping Station											
Site preparation and setup											
Footpath Crewe 29/1 accommodation overbridge											
Coppenhall Moss South embankment											
Crewe North portal retained cutting											
Parkers Road overbridge											
Crewe Tunnel											
Coppenhall Moss cutting											
Crewe Tunnel North portal auto - transformer station (civil works)											
Crewe Tunnel North portal building											
Crewe Tunnel North porous portal											

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Hough to Walley's Green	2025 Quarters	2026 Quarters	2027 Quarters	2028 Quarters	2029 Quarters	2030 Quarters	2031 Quarters	2032 Quarters	2033 Quarters	2034 Quarters	2035 Quarters
Crewe Tunnel North portal auto - transformer station (rail systems works)											
Rail systems - tunnel portal building											
Rail systems - tunnel systems											
Rail systems - switches and crossings											
Rail systems - track works											
Site reinstatement											
Warmingham Moss satellite compound (HBD)											
Warmingham Moss satellite compound (AP1)											
Site preparation and setup											
Coppenhall Moss culvert											
Footpath Crewe 29 offline culvert											
Crewe Northern Connection - southbound works											
Warmingham Moss telecommunications site (civil works)											
Warmingham Moss telecommunications site (rail systems works)											

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Hough to Walley's Green	2025 Quarters	2026 Quarters	2027 Quarters	2028 Quarters	2029 Quarters	2030 Quarters	2031 Quarters	2032 Quarters	2033 Quarters	2034 Quarters	2035 Quarters
Crewe Northern Connection - civil finishing works											
Rail systems installation - track works											
Site reinstatement											
Moss Lane satellite compound (HBD)											
Moss Lane satellite compound (AP1)											
Site preparation and setup											
Footpath Minshull Vernon 8/1 accommodation overbridge											
Coppenhall Moss North embankment											
Crewe Northern Connection - northbound works											
Crewe Northern Connection - civil finishing works											
Rail systems - track works											
Site reinstatement											
Track laying and testing & commissioning											
Area track laying											
Testing and commissioning											

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Key	
	Compound duration showing start and end of mobilisation. Activities below will be managed from the above compound. Second phase site reinstatement can occur post the compound demobilisation.
	Activity duration (indicates where there is no change from the main ES taking into consideration SES1 changes and AP1 amendments).
	Increase in duration or activity moved as a result of a SES1 change or AP1 amendment. (A purple box indicates that works are now taking place in the quarter indicated).
	Decrease in duration or activity moved as a result of a SES1 change or AP1 amendment (An orange box indicates that works are no longer taking place in the quarter indicated).
	Removal as a result of SES1 change or AP1 amendment.
	New elements of the programme (compound or associated) works as a result of a SES1 change or an AP1 amendment.

7 Combined effects of changes and amendments in the Hough to Walley's Green area due to changes in construction traffic flows

7.1 Introduction

- 7.1.1 This section reports the combined assessment of new or different significant traffic and traffic related effects, as a result of changes in traffic flows. These relate to changes associated with SES1 changes and AP1 amendments, where the change in traffic flows cannot be directly attributed to a specific SES1 change or an AP1 amendment.
- 7.1.2 The assessment has also considered any impacts in the Hough to Walley's Green area associated with SES1 changes and AP1 amendments in other community areas.
- 7.1.3 Traffic and transport effects are reported first, since the effects arise from changes in traffic flows. Other topics where a significant effect has been identified, are then reported in the following sequence:
- air quality;
 - community;
 - ecology;
 - health;
 - sound, noise and vibration; and
 - water resources and flood risk.

7.2 SES1 changes and AP1 amendments of relevance to this assessment

- 7.2.1 The assessment includes all changes to traffic. The primary contributors to the changes in traffic are the changes to the movement of excavated material, construction programme and construction assumptions. The assessment takes into account measures to reduce the need to move material by the road network and use of site haul routes to limit traffic on the road network.
- 7.2.2 Of the design changes and amendments, the following make a particular contribution to the changes in traffic flows in the Hough to Walley's Green area:
- additional land permanently required for the realignment and extension of Crewe tunnel (AP1-001-001); and

- additional land temporarily required for modifications to Warmingham Road and Groby Road junction (AP-001-004).

7.3 Traffic and transport

Scope, assumptions and limitations

- 7.3.1 The assessment scope, key assumptions and limitations for the traffic and transport assessment are as set out in Volume 1 (Section 8) and the EIA Scope and Methodology Report (SMR)⁷ of the main ES.
- 7.3.2 The peak level of construction traffic activity is expected to be 2030 and the opening year to be 2038. The forecasts used in the assessment have been produced prior to the development of a full understanding of the likely impact of COVID-19 on economic growth and travel behaviour. The full impact of COVID-19 is not yet known but is considered likely to result in lower travel demand than the forecasts used in the assessment for background traffic and rail, including HS2.
- 7.3.3 Consequently, the assessment is considered to overstate travel demand for the construction scenarios and therefore to presents a robust case for traffic and transport.
- 7.3.4 Information on traffic and transport impacts within the Hough to Walley's Green area is contained in Volume 5, Appendix: TR-003-00001 Transport Assessment of the main ES. Changes to traffic and transport impacts within the Hough to Walley's Green area as a result of the AP1 revised scheme are contained in SES1 and AP1 ES Volume 5, Appendix: TR-003-00001, Transport Assessment.

Environmental baseline

Existing environmental baseline

- 7.3.5 The baseline traffic and transport information is described in Section 14 of Volume 2, Community Area report: Hough to Walley's Green (MA01) of the main ES, as amended in Section 2 of this report and below.
- 7.3.6 Since the main ES, additional traffic information has been used in the development of updated baseline and future baseline models for the SES1 scheme and AP1 revised scheme. This includes new traffic data from National Highways, as set out in the BID TR-004-00001 SES1 and AP1 ES. These data have been combined with information collected for local junction modelling, as set out in BID TR-004-00001 which accompanied the main ES.

Future baseline

Construction (2030)

- 7.3.7 The future baseline traffic and transport information is described in Section 14 of Volume 2, Community Area report: Hough to Walley's Green (MA01) the main ES, as amended below.
- 7.3.8 The assumptions regarding underlying committed developments and transport schemes for each assessment year have been reviewed and updated taking into account feedback from National Highways and Cheshire East Council (CEC) and are considered to be appropriately reflected in the traffic forecasts.
- 7.3.9 Since the main ES, there have been three committed or recently completed substantial highway schemes in the study area that have been taken into account in the future baseline for the AP1 revised scheme. These schemes have now been incorporated into the A500 Crewe Area Wide Transport model for the AP1 revised scheme in the 2030 future baseline scenario. These are:
- Sunnybank Road and Pyms Lane road closures - in November 2020, Pyms Lane was closed between Minshull New Road and the Crewe Pyms Lane Household Waste Recycling Centre, and Sunnybank Road was closed between Pyms Lane and the North Wales Coast Line railway bridge as part of Bentley Motors' plans to expand its campus in Crewe;
 - M6 junction 16 to 19 (Crewe to Knutsford) Smart Motorway – this scheme was completed in 2019 and comprised the provision of a fourth lane in both directions, plus associated infrastructure; and
 - Groby Road/Remer Street/Maw Green Road Improvement Scheme – this scheme is associated with the nearby Coppenhall East residential development (committed development MA01/148 in Volume 5, Appendix: CT-004-00000, Planning data of the main ES). This scheme includes the Sydney Road/Maw Green Road, Remer Street/Sydney Road/Elm Drive and Remer Street/Groby Drive junctions and was included in the future baseline local junction models for the assessment of the original scheme. However, as the timing of delivery of this improvement scheme remains uncertain, these junctions have been assessed in the local junction models with and without the improvement scheme in place.

Effects arising during construction

Avoidance and mitigation measures

- 7.3.10 No avoidance or mitigation measures additional to those reported in the main ES and draft Code of Construction Practice (CoCP)¹ are required.

Assessment of impacts and effects

Temporary effects

Key construction transport issues

7.3.11 Table 49 of Volume 2, Community Area report: Hough to Walley's Green (MA01) of the main ES provides details of construction compounds in the Hough to Walley's Green area. This information has been updated to reflect changes resulting from the AP1 revised scheme and is provided in Table 19.

Table 19: Typical vehicle trip generation for construction compounds in the Hough to Walley's Green area

Compound type	Compound name	Indicative start/set up date (years/quarter)	Estimated duration of active use (years/months)	Average daily combined two-way car/LGV trips during busy period and within peak month of activity	Average daily combined two-way HGV trips during busy period and within peak month of activity	Estimated duration of busy period (months)
Satellite	Crewe tunnel south portal satellite compound	2030 Q1	4 years	94 - 248	188 - 190	7
Satellite	Cowley Way vent shaft satellite compound	2027 Q2	5 years and 9 months	110 - 190	116 - 118	2
Satellite	Middlewich Street vent shaft satellite compound	2027 Q2	5 years 9 months	106 - 128	72 - 88	9
Main	Crewe tunnel north main compound	2026 Q3	7 years and 6 months	374 - 576	222 - 338	33
Satellite	Warmingham Moss satellite compound	2027 Q2	7 years and 3 months	196 - 502	166 - 226	7
Satellite	Moss Lane satellite compound	2027 Q2	7 months and 9 months	196 - 468	154 - 210	11

7.3.12 Details of the construction routes for construction compounds in the Hough to Walley's Green area are reported in Table 50 of Volume 2, Community Area report: Hough to Walley's Green (MA01) of the main ES. This information has been updated to reflect changes resulting from the AP1 revised scheme and is provided in Table 20.

Table 20: Construction HGV routes for construction compounds in the Hough to Walley's Green area

Compound name(s)	Access routes to / from compound(s) to main road network
Crewe tunnel south portal satellite compound	Casey Lane, Newcastle Road and A531 Newcastle Road

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Compound name(s)	Access routes to / from compound(s) to main road network
Cowley Way vent shaft satellite compound	Route to/from the south: Cowley Way, A532 Weston Road, A5020 David Whitby Way and A500 Shavington Bypass Route to/from the north: Cowley Way, A532 Weston Road and A534 Crewe Road
Middlewich Street vent shaft satellite compound	Route to/from the south: B5076 Middlewich Street, Remer Street, Sydney Road and A5020 University Way B5076 Middlewich Street, Remer Street, B5076 North Street, B5076 Bradfield Road, B5076 Flowers Lane and A530 Middlewich Road Route to/from the north: B5076 Middlewich Street, Remer Street, Sydney Road and A534 Haslington Bypass
Crewe tunnel north main compound	Route to/from the south: Warmingham Road, Groby Road, Sydney Road and A5020 University Way Parkers Road, B5076 Bradfield Road, B5076 Flowers Lane and A530 Middlewich Road Route to/from the north: Warmingham Road, Groby Road, Sydney Road and A534 Haslington Bypass Parkers Road, B5076 Bradfield Road, B5076 Flowers Lane and A530 Middlewich Road
Warmingham Moss satellite compound	Route to/from the south: Site haul route, Warmingham Road, Groby Road, Sydney Road and A5020 University Way Site haul route, Warmingham Road, Groby Road, Sydney Road and A534 Haslington Bypass Site haul route, Parkers Road, B5076 Bradfield Road, B5076 Flowers Lane and A530 Middlewich Road Site haul route, Parkers Road, B5076 Bradfield Road, B5076 Flowers Lane and A530 Middlewich Road Route to/from the north: Site haul route and A530 Nantwich Road
Moss Lane satellite compound	Site haul route and A530 Middlewich Road

- 7.3.13 Information on the indicative construction programme is provided in Section 6 of this report, and the construction methodology is summarised in Volume 1 (Section 6) of the main ES. These illustrate how the phasing of activities at different compounds will generally be staggered and that construction activities at individual compounds may not occur over the whole duration presented in Table 19.
- 7.3.14 Utility works have been included in the assessment where they are major and where the traffic or transport impacts from the works separately, or in combination with other works, will be greater than other construction activities arising within the area. Most utility works are expected to result in only localised traffic and pedestrian diversions, which will be of short-term duration and are not expected to result in significant effects.

- 7.3.15 The effects of construction of the AP1 revised scheme on the highway network in the Hough to Walley's Green area have been assessed by undertaking strategic model runs for a number of 'with AP1 revised scheme' construction scenarios and comparing the traffic flows and delays against the 2030 future baseline scenario. The assessment is based on the highest volume of construction traffic on each construction route in each construction scenario. Where construction routes will serve more than one construction compound, the assessment is based on the highest combined volume of construction traffic on each section of each route in each construction scenario.
- 7.3.16 In using the strategic model, the impacts and effects have been considered in a utilities scenario and two scenarios covering the main construction phases. These scenarios ensure that the assessment addresses the different combinations and interactions of advance works, utility works, temporary highway closures and diversions and construction HGV movements through the construction period. It should be noted that, due to changes in the construction programme of the AP1 revised scheme, these scenarios differ slightly from those reported in the main ES:
- utilities scenario, 2025 Q1 – 2026 Q3. This scenario corresponds with utility and advance works and includes shuttle working on the A532 West Street/Coppenhall Lane. There are negligible construction traffic movements in this scenario;
 - scenario 1, 2026 Q4 - 2030 Q1. This corresponds with the construction peak during the period when Clive Green Lane (Wimboldsley to Lostock Gralam area (MA02)) will not be available to HS2 construction traffic and includes commencement of works on Cowley Way vent shaft and Middlewich Street vent shaft. This scenario equates to the overall peak in construction traffic across the whole construction period; and
 - scenario 2, 2030 Q2 – 2033 Q4. This corresponds with the construction peak following the realignment of Clive Green Lane (Wimboldsley to Lostock Gralam area (MA02)) and includes works associated with Crewe tunnel north main compound. This scenario equates to 87% of the overall peak in construction traffic across the whole construction period.
- 7.3.17 The HS2 construction works and the associated construction traffic movements differ for each of these scenarios. The assessment considers the impacts in all temporal phases and reports the highest magnitude of significant effects, regardless of which scenario they arise in.
- 7.3.18 Table 51 of Volume 2, Community Area report: Hough to Walley's Green (MA01) of the main ES gives details of the most relevant highway interventions and works for each scenario in the Hough to Walley's Green area. This information has been updated to reflect changes resulting from the AP1 revised scheme and is provided in Table 21.

Table 21: Construction highway interventions by scenario

Type	Intervention	Utilities scenario - 2025 Q1 - 2026 Q3	Scenario 1 - 2026 Q4 - 2030 Q1	Scenario 2 - 2030 Q2 - 2033 Q4
Utilities	Shuttle working on A532 West Street/Coppenhall Lane	Included	Not included	Not included
Main works	Clive Green Lane (Wimboldsley to Lostock Gralam area (MA02)) available to construction traffic	Not included	Not included	Included
Main works	Groby Road/Remer Street/Maw Green Road Junction Improvement Scheme	Included*	Included*	Included*
	Construction HGV traffic assessed as a percentage of peak construction HGV traffic	Negligible	100%	87%

**While it is considered likely that this improvement scheme will have been completed prior to the commencement of the construction of the AP1 revised scheme, due to the uncertainty over the timing of its delivery, the Sydney Road/Maw Green Road, Remer Street/Sydney Road/Elm Drive and Remer Street/Groby Drive junctions have been assessed both with and without the junction improvement scheme in place.*

7.3.19 The strategic models have been used to assess these construction scenarios taking account of the HS2 construction traffic movements and any road closures, diversions and realignments, traffic management or changes to junction operations in each scenario. The strategic model outputs for each of these scenarios are only relevant to the assessment of the effects on traffic delays to vehicle occupants and traffic related severance.

Highway network

7.3.20 The AP1 revised scheme includes a number of changes to the highway network compared to the original scheme. This includes an amendment to the Warmingham Road/Groby Road junction (AP1-001-004) to mitigate impacts at this location as reported in the main ES. This amendment is temporary and will be in place during construction of the AP1 revised scheme only.

7.3.21 The AP1 revised scheme also includes an amendment that will retain the existing Parkers Road Overbridge, associated with additional land permanently required for the realignment and extension of Crewe tunnel (AP1-001-001). This will remove the temporary closure and diversion of traffic on a section of Parkers Road during the construction phase, as reported in the main ES.

7.3.22 The AP1 revised scheme includes an amendment to the route of the power supply to Crewe Tunnel (AP1-001-002). This will remove the temporary traffic management and shuttle working on the A530 Middlewich Road, Pym's Lane and Underwood Lane, as reported in the main ES. The amendment will, however, result in traffic management including temporary shuttle working with traffic control, in addition to that reported in the main ES, on the A532 West Street/Coppenhall Lane.

7.3.23 The indicative construction programme in Section 6 of this report illustrates how the phasing of activities will generally be staggered and that construction activities associated with the AP1 revised scheme may not occur at the same time.

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7.3.24 The combined impact of all SES1 changes and AP1 amendments will lead to flow changes on the highway network in all construction scenarios. This will result in changes to the traffic congestion and delay effects for vehicle occupants, as reported in the main ES. The significant effects with the highest magnitude at each junction are set out in Table 22. The significance of the effect reported in the main ES is indicated in brackets.

Table 22: Junctions resulting in significant effects on delays to vehicle occupants and congestion, 2030

Junction name	Significant effect	AP1 construction scenario
A500 Shavington Bypass/A51 Newcastle Road/A51 Nantwich Bypass/Cheerbrook Road/Newcastle Road (Cheerbrook Roundabout)	Major adverse (Previously moderate adverse)	Utilities scenario and scenarios 1 and 2
A500 Newcastle Road/A500 Shavington Bypass/A531 Newcastle Road/B5472 Weston Road (Meremoor Moss roundabout)	Major adverse (Previously moderate adverse)	Scenarios 1 and 2
M6 Junction 16/A500 Newcastle Road/B5078 Radway Green Road/A500 (Barthomley Interchange)	Moderate adverse (Previously no effect)	Utilities scenario and scenarios 1 and 2
A51 Nantwich Bypass/A534 Crewe Road/B5338 Crewe Road/Park Road	Minor adverse (Previously major adverse)	Scenario 1
A500 Shavington Bypass/B5071 Jack Mills Way	Minor adverse (Previously no effect)	Scenarios 1 and 2
A500 Shavington Bypass/A5020 David Whitby Way	Moderate adverse (Previously minor adverse)	Scenarios 1 and 2
A530 Middlewich Road/A51 Nantwich Bypass/B5334 Middlewich Road (Alvaston Roundabout)	Minor adverse (Previously moderate adverse)	Scenarios 1 and 2
A532 Weston Road/A5020 University Way/A5020 David Whitby Way/B5472 Weston Road/Savoy Road	No change from main ES (Previously moderate adverse)	Utilities scenario and scenarios 1 and 2
Valley Road/Wistaston Green Road	Minor adverse (Previously moderate adverse)	Scenarios 1 and 2
A534 Nantwich Road/A5078 Edleston Road/Edward Street	Minor adverse (Previously no effect)	Utilities scenario
A534 Nantwich Road/A5019 Mill Street/B5071 South Street	Major adverse (Previously no effect)	Utilities scenario and scenarios 1 and 2
Wistaston Green Road/Capesthorpe Road	No change from main ES (Previously minor adverse)	Scenario 1
A534/A534 Crewe Green Road/A5020 University Way (Crewe Green roundabout)	No change from main ES (Previously moderate adverse)	Utilities scenario and scenarios 1 and 2
A530 Middlewich Road/Marshfield Bank/A532 Copenhall Lane	Minor adverse (Previously no effect)	Scenarios 1 and 2
A532 Earle Street/A532 Manchester Bridge/William Street/Grand Junction Way (A532 Earle Street Roundabout)	No effect (Previously moderate adverse)**	-
A532 Vernon Way/A532 Earle Street/A5019 Vernon Way/Earle Street	No change from main ES (Previously minor adverse)	Scenario 1
A532 West Avenue/Victoria Avenue	Major adverse (Previously no effect)	Scenario 1

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Junction name	Significant effect	AP1 construction scenario
A532 West Street/A5078 Dunwoody Way/Bessemer Way	No effect (Previously moderate adverse)	-
Badger Avenue/Broad Street	Moderate adverse (Previously minor adverse)	Scenario 1
Badger Avenue/Underwood Lane	Minor adverse (Previously moderate adverse)	Scenario 1
Broad Street/Davenport Street/McLaren Street	No effect (Previously minor adverse)	-
Remer Street/Groby Road/Sydney Road/Elm Drive/Maw Green Road (proposed layout)	No change from main ES (Previously major adverse)	Scenarios 1 and 2
B5076 Middlewich Street/B5076 North Street/Broad Street/Stoneley Road	No effect (Previously moderate adverse)	-
B5076 Bradfield Road/B5076 North Street/Broughton Road	No effect (Previously minor adverse)	-
B5076 Bradfield Road/Mablins Lane	No effect (Previously major adverse)	-
B5076 Bradfield Road/Parkers Road	Moderate adverse (Previously major adverse)	Utilities scenario
B5076 Flowers Lane/B5076 Bradfield Road/Minshull New Road/Smithy Lane	No change from main ES (Previously major adverse)	Utilities scenario
A534/Crewe Road	No change from main ES (Previously moderate adverse)	Scenarios 1 and 2
Warmingham Road/Waldron's Lane	No effect (Previously moderate adverse)	-
Warmingham Road/Groby Road*	Moderate beneficial (Previously major adverse)	Scenarios 1 and 2
A530 Middlewich Road/B5076 Flowers Lane/Eardswick Lane	Major adverse (increased) (Previously major adverse)	Scenarios 1 and 2
Warmingham Road/Hall Lane	No effect (Previously major adverse)	-
A534/A533 Old Mill Road	Moderate adverse (Previously minor adverse)	Scenarios 1 and 2
Brookhouse Lane/Eardswick Lane/Cross Lane	No effect (Previously minor adverse)	-
A533 Middlewich Road/Platt Avenue	Moderate adverse (Previously no effect)	Scenario 1
A533 London Road/B5079 Station Road	Major adverse (Previously moderate adverse)	Scenarios 1 and 2
A534 Congleton Road/A534 Old Mill Road/Congleton Road	Major adverse (Previously moderate adverse)	Utilities scenario and scenarios 1 and 2
A533 London Road/Moss Lane	No effect (Previously moderate adverse)	-
M6 Junction 17/A534 Congleton Road	No effect (Previously minor adverse)	-

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Junction name	Significant effect	AP1 construction scenario
Forge Mill Lane/Dragons Lane/Tetton Lane/White Hall Lane	Minor adverse (Previously moderate adverse)	Scenarios 1 and 2

**Existing layout in utilities scenario and proposed layout from scenario 1 onwards*

*** As corrected in Section 2 of this report*

7.3.25 Construction of the AP1 revised scheme will result in substantial changes in traffic flows (i.e. more than 30% for HGVs or for all vehicles) in some locations, which can lead to changes in traffic-related severance for non-motorised users, which are significant. The significant effects with the highest magnitude in each location are set out in Table 23 for all-traffic effects and Table 24 for HGV traffic effects. The significance of the effect reported in the main ES is indicated in brackets.

Table 23: Roads with changes in daily all vehicle movements (more than 30%) resulting in significant effects on traffic-related severance for non-motorised users, 2030

Road name	Significant effect	AP1 construction scenario
Annions Lane (between A51 London Road and B5071 Main Road)	Minor adverse (Previously no effect)	Scenario 1
Wybunbury Lane (between Wybunbury Lane and B5071 Stock Lane)	Minor adverse (Previously no effect)	Scenarios 1 and 2
Back Lane (between Casey Lane and Newcastle Road)	No effect (Previously minor adverse)	-
Main Road east (between Newcastle Road and Main Road west)	Minor adverse (Previously no effect)	Scenario 1
Casey Lane (between Back Lane and Weston Lane)	Minor adverse (Previously no effect)	Scenario 1
Cemetery Road (between Cemetery Road north and Main Road)	Minor adverse (Previously no effect)	Scenario 2
Cemetery Road (between Whites Lane and Mere Road)	No change from main ES (Previously minor adverse)	Scenarios 1 and 2
Barthomley Road (between Radway Green Road and B5077 Butterton Lane)	Minor adverse (Previously moderate adverse)	Scenario 1
Weston Road Service Road (between Weston Road south access and Weston Road north access)	Major adverse (Previously no effect)	Utilities scenario
Wistaston Road (between Flag Lane and Walthall Street)	Moderate adverse (Previously no effect)	Utilities scenario
Coleridge Way (between Hungerford Road and Wordsworth Drive)	No effect (Previously major adverse)	-
Shakespeare Drive (between Sydney Road and Laureston Avenue)	No effect (Previously moderate adverse)	-
Laureston Avenue (between Shakespeare Drive and Wordsworth Drive)	No effect (Previously moderate adverse)	-
Wordsworth Drive (between Tennyson Avenue and Kipling Way)	No effect (Previously moderate adverse)	-

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Road name	Significant effect	AP1 construction scenario
Wordsworth Drive (between Kipling Way and Laureston Avenue)	No effect (Previously moderate adverse)	-
Wordsworth Drive (between Coleridge Way and Tennyson Avenue)	No effect (Previously moderate adverse)	-
Coleridge Way (between Lansdowne Road and Wordsworth Drive)	No effect (Previously moderate adverse)	-
Lansdowne Road (between Coleridge Way and Pelican Close)	No effect (Previously moderate adverse)	-
Lansdowne Road (between Lansdowne Road and Sydney Road)	No effect (Previously moderate adverse)	-
Stamp Avenue (between Greenway and B5076 Middlewich Street)	No effect (Previously moderate adverse)	-
Lime Tree Avenue (between B5076 Middlewich Street and Sycamore Avenue)	No change from main ES (Previously minor adverse)	Scenario 2
Lime Tree Avenue (between Sycamore Avenue and Acer Avenue)	No change from main ES (Previously minor adverse)	Scenario 2
Clay Lane (between Newtons Lane and Maw Lane)	No effect (Previously moderate adverse)	-
Greenway (between Stamp Avenue and B5076 Middlewich Street)	No effect (Previously moderate adverse)	-
Lime Tree Avenue (between Prunus Road and Elm Drive)	Minor adverse (Previously major adverse)	Scenario 2
Elm Drive (between Lime Tree Avenue and Remer Street)	No effect (Previously major adverse)	-
Lime Tree Avenue (between Acer Avenue and Prunus Road)	Minor adverse (Previously major adverse)	Scenario 2
Acer Avenue (between Remer Street and Lime Tree Avenue)	No effect (Previously major adverse)	-
Selworthy Drive (between B5076 Bradfield Road and Underwood Lane)	No effect (Previously moderate adverse)	-
Newtons Lane (between Clay Lane and Nesfield Drive)	No effect (Previously major adverse)	-
Underwood Lane (between Cliffe Road and Newbury Avenue)	No effect (Previously moderate adverse)	-
Newtons Lane (between Nesfield Drive and Crewe Road)	No effect (Previously moderate adverse)	-
Underwood Lane (between Newbury Avenue and Pear Tree Avenue)	No effect (Previously moderate adverse)	-
Stoneley Road (between B5076 Broad Street and Waldron's Lane)	No effect (Previously major adverse)	-
Underwood Lane (between Pear Tree Avenue and B5076 Bradfield Road)	No effect (Previously moderate adverse)	-
B5076 Bradfield Road (between Underwood Lane and Broughton Road)	No effect (Previously moderate adverse)	-

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Road name	Significant effect	AP1 construction scenario
B5076 Bradfield Road (between Cliffe Road and Underwood Lane)	No effect (Previously moderate adverse)	-
Broughton Road (between Maplins Moss Place and Parkers Road)	No effect (Previously major adverse)	-
Stoneley Road (between Waldron's Lane and Groby Road)	Moderate adverse (Previously no effect)	Scenarios 1 and 2
Parkers Road (between Higher Croft Drive and Parkfield)	No effect (Previously moderate beneficial)	-
Waldrons Lane (between Stoneley Road and Warmingham Road)	Major adverse (Previously no effect)	Scenarios 1 and 2
Parkers Road (between Mablins Lane and Broughton Road)	No effect (Previously moderate beneficial)	-
A530 Middlewich Road (between Eardswick Lane and Brookhouse Lane)	No effect (Previously moderate adverse)	-
B5074 Over Road/B5074 Swanlow Lane (between Cross Lane and Moor Lane)	No effect (Previously moderate adverse)	-

Table 24: Roads with changes in daily HGV movements (more than 30%) resulting in significant effects on traffic-related severance for non-motorised users, 2030

Road name	Significant effect	AP1 construction scenario
Back Lane (between Casey Lane and Newcastle Road)	Major adverse (Previously moderate adverse)	Scenarios 1 and 2
Newcastle Road (between Chorlton Lane and A531 Newcastle Road)	Moderate adverse (Previously no effect)	Scenario 2
Newcastle Road (between Casey Lane and Chorlton Lane)	Moderate adverse (Previously major adverse)	Scenario 2
A531 Newcastle Road (between Main Road and A500 Shavington Bypass)	Moderate adverse (Previously major adverse)	Scenario 2
A51 Nantwich Bypass (between A51 Newcastle Road and A534 Crewe Road)	Major adverse (Previously moderate adverse)	Scenario 1
Casey Lane (between Back Lane and Weston Lane)	No change from main ES (Previously moderate adverse)	Scenario 2
A500 Shavington Bypass (between A51 Newcastle Road and B5071 Jack Mills Way)	No change from main ES (Previously moderate adverse)	Scenario 1
A500 Shavington Bypass (between B5071 Jack Mills Way and A5020 David Whitby Way)	Moderate adverse (Previously no effect)	Scenario 1
A500 Shavington Bypass (between A5020 David Whitby Way and A500 Newcastle Road)	No change from main ES (Previously moderate adverse)	Scenario 1
A500 Newcastle Road (between A500 Shavington Bypass and M6 junction 16)	No change from main ES (Previously moderate adverse)	Scenario 1
A51 Nantwich Bypass (between A534 Crewe Road and A530 Middlewich Road)	Moderate adverse (Previously major adverse)	Scenarios 1 and 2

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Road name	Significant effect	AP1 construction scenario
A5020 David Whitby Way (between A500 Shavington Bypass and B5472 Weston Road)	No effect (Previously major adverse)	-
A530 Middlewich Road (between A51 Nantwich Bypass and Colleys Lane)	No change from main ES (Previously major adverse)	Scenarios 1 and 2
A5020 University Way (between A534 Crewe Green Road and A532 Weston Road)	No effect (Previously major adverse)	-
A530 Middlewich Road (between Colleys Lane and Wistaston Green Road)	No change from main ES (Previously major adverse)	Scenarios 1 and 2
Union Street (between A5078 Edleston Road and Lord Street)	Moderate adverse (Previously no effect)	Scenario 2
Union Street (between Lord Street and A5019 Mill Street)	Moderate adverse (Previously no effect)	Scenario 2
A530 Middlewich Road (between Wistaston Green Road and A532 Coppenhall Lane)	No change from main ES (Previously major adverse)	Scenarios 1 and 2
Sydney Road (between Hungerford Road and Shakespeare Drive)	Major adverse (decreased) (Previously major adverse)	Scenarios 1 and 2
Sydney Road (between Shakespeare Drive and Lansdowne Road)	Major adverse (decreased) (Previously major adverse)	Scenarios 1 and 2
A530 Middlewich Road (between A532 Coppenhall Lane and Pyms Lane)	No change from main ES (Previously major adverse)	Scenarios 1 and 2
B5076 Middlewich Road (between Elm Drive and Stamp Avenue)	No change from main ES (Previously moderate adverse)	Scenario 1
Sydney Road (between Herbert Street and Maw Green Road)	Major adverse (decreased) (Previously major adverse)	Scenario 1
B5076 Middlewich Street (between Stamp Avenue and Lime Tree Avenue)	No change from main ES (Previously moderate adverse)	Scenario 1
B5076 Middlewich Street (between Lime Tree Avenue and Remer Street)	No change from main ES (Previously moderate adverse)	Scenario 1
Sydney Road (between Maw Green Road and Elm Drive)	No effect (Previously major adverse)	-
Remer Street (between Groby Road and Elm Drive)	No effect (Previously major adverse)	-
A530 Middlewich Road (between Pyms Lane and Middlewich Road)	Major adverse (increased) (Previously major adverse)	Scenarios 1 and 2
Remer Street (between Acer Avenue and Groby Road)	No effect (Previously major adverse)	-
Remer Street (between B5076 Middlewich Street and Acer Avenue)	No effect (Previously major adverse)	-
B5076 Middlewich Street (between Broad Street and Remer Street)	No effect (Previously major adverse)	-
B5076 North Street (between Broughton Road and Broad Street)	No effect (Previously major adverse)	-
B5076 Bradfield Road (between Underwood Lane and Broughton Road)	No effect (Previously major adverse)	-

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Road name	Significant effect	AP1 construction scenario
B5076 Bradfield Road (between Selworthy Drive and Mablins Lane)	No effect (Previously major adverse)	-
B5076 Bradfield Road (between Mablins Lane and Cliffe Road)	No effect (Previously major adverse)	-
B5076 Bradfield Road (between Cliffe Road and Underwood Lane)	No effect (Previously major adverse)	-
Groby Road (between Remer Street and Stoneley Road)	No change from main ES (Previously major adverse)	Scenarios 1 and 2
A530 Middlewich Road (between Middlewich Road and Smithy Lane)	Major adverse (increased) (Previously major adverse)	Scenarios 1 and 2
B5076 Bradfield Road (between Parkers Road and Selworthy Drive)	No effect (Previously major adverse)	-
B5076 Bradfield Road (between Parkers Road and B5076 Flowers Lane)	No effect (Previously major adverse)	-
Parkers Road (between B5076 Bradfield Road and Higher Croft Drive)	Moderate adverse (Previously no effect)	Scenarios 1 and 2
Parkers Road (between Higher Croft Drive and Parkfield)	No change from main ES (Previously moderate adverse)	Scenarios 1 and 2
Parkers Road (between Parkfield and Mablins Lane)	Moderate adverse (Previously no effect)	Scenarios 1 and 2
A530 Middlewich Road (between Smithy Lane and B5076 Flowers Lane)	Major adverse (increased) (Previously major adverse)	Scenarios 1 and 2
Parkers Road (between Mablins Lane and Broughton Road)	No change from main ES (Previously major adverse)	Scenarios 1 and 2
Groby Road (between Stoneley Road and Warmingham Road)	No change from main ES (Previously major adverse)	Scenarios 1 and 2
Warmingham Road (between Broughton Road and Waldron's Lane)	No change from main ES (Previously major adverse)	Scenarios 1 and 2
B5076 Flowers Lane (between A530 Middlewich Road and B5076 Bradfield Road)	Moderate adverse (Previously major adverse)	Scenarios 1 and 2
Warmingham Road (between Waldron's Lane and Groby Road)	No change from main ES (Previously major adverse)	Scenarios 1 and 2
A530 Middlewich Road (between B5076 Flowers Lane and Eardswick Lane)	Major adverse (increased) (Previously major adverse)	Scenarios 1 and 2
A530 Middlewich Road (between Eardswick Lane and Brookhouse Lane)	Major adverse (increased) (Previously major adverse)	Scenarios 1 and 2

Other mitigation measures

7.3.26 No further appropriate traffic and transport mitigation measures have been identified. HS2 Ltd will, however, continue to work with the relevant highway authorities to consider whether any further mitigation measures would be required.

Summary of likely residual significant effects

- 7.3.27 The temporary residual significant effects during construction remain as described above. These effects will be temporary and reversible in nature lasting only for the duration of the construction works.
- 7.3.28 The AP1 revised scheme will result in the following changes to the congestion and delay effects for vehicle occupants, as reported in the main ES:
- new major adverse effect on two junctions;
 - new moderate adverse effect on two junctions;
 - new minor adverse effect on three junctions;
 - different (increased) major adverse significant effect on one junction;
 - change (increase) from moderate adverse effect to major adverse effect on four junctions;
 - change (increase) from minor adverse effect to moderate adverse effect on three junctions;
 - change (decrease) from major adverse effect to moderate adverse effect on two junctions;
 - change (decrease) from major adverse effect to minor adverse effect on one junction;
 - change (decrease) from moderate adverse effect to minor adverse effect on four junctions;
 - change (decrease) from major adverse effect to moderate beneficial effect on one junction; and
 - significant adverse effects removed on 11 junctions (two major, five moderate, four minor).
- 7.3.29 The AP1 revised scheme will result in the following changes to the traffic-related severance effects for non-motorised users, as reported in the main ES:
- new major adverse effect on two roads;
 - new moderate adverse effect on eight roads;
 - new minor adverse effect on four roads;
 - different (increased) major adverse significant effects on five roads;
 - change (increase) from moderate adverse effect to major adverse effect on two roads;
 - different (decreased) major adverse significant effects on three roads;
 - change (decrease) from moderate adverse effect to minor adverse effect on one road;
 - change (decrease) from major adverse effect to moderate adverse effect on four roads;
 - change (decrease) from major adverse effect to minor adverse effect on two roads; and
 - significant adverse effects removed on 37 roads (20 major and 17 moderate).

Cumulative effects

- 7.3.30 This combined assessment has taken into account cumulative effects from background traffic growth, committed developments and traffic and transport impacts of the construction works arising from the SES1 changes and AP1 amendments in this area and other community areas.

Effects arising during operation

- 7.3.31 There are no changes to the likely significant effects during operation identified in the main ES as a result of the SES1 changes and AP1 amendments.

7.4 Air quality

Scope, assumptions and limitations

- 7.4.1 The assessment scope, key assumptions and limitations for air quality are as set out in Volume 1 and the SMR of the main ES.

Environmental baseline

Existing environmental baseline

- 7.4.2 The baseline air quality information is as described in Section 4 of Volume 2, Community Area report: Hough to Walley's Green area (MA01) of the main ES. A summary of the baseline information relevant to the assessment of the AP1 revised scheme is provided below. An update of the model verification has been undertaken and is presented within Volume 5, Appendix: AQ-001-0MA01.

Future environmental baseline

- 7.4.3 The Planning data report of the main ES (see Volume 5, Appendix: CT-004-00000 of the main ES) provides details of developments assumed to have been implemented by 2025. This information has been supplemented by the developments listed in the equivalent volume of the SES1 and AP1 ES. These developments have been considered as additional receptors, where relevant, as part of the construction dust assessment.

Effects arising during construction

Avoidance and mitigation measures

- 7.4.4 No avoidance or mitigation measures additional to those reported in the main ES and draft CoCP are required.

Assessment of impacts and effects

- 7.4.5 Construction activity could affect local air quality through the additional traffic generated on the highway network and site haul routes as a result of construction vehicles and through changes to traffic patterns arising from temporary road diversions and realignments.
- 7.4.6 The assessment of construction traffic emissions has been undertaken for a 'without the AP1 revised scheme' scenario and a 'with the AP1 revised scheme' scenario. The traffic data for each scenario includes the additional traffic from future committed developments.
- 7.4.7 Construction traffic data in the study area have been screened to identify roads that required further assessment and to confirm the likely effect of the change in emissions from vehicles using those roads during construction of the AP1 revised scheme. There were two construction traffic scenarios assessed for air quality in the Hough to Walley's Green area.
- 7.4.8 Receptors expected to experience the greatest change in concentrations have been included in the air quality model. No significant effects are predicted in relation to NO₂, PM₁₀ or PM_{2.5} concentrations. No significant effects are anticipated at any of the ecological receptors in this area.
- 7.4.9 Compared to the main ES, significant adverse effects on annual mean NO₂ concentrations at eight modelled receptors on North Street, Crewe, the B5076 Bradfield Road, Crewe and Broughton Road, Crewe are removed due to the AP1 revised scheme.

Other mitigation measures

- 7.4.10 No mitigation measures additional to those reported in the main ES and draft CoCP are required.

Summary of likely residual significant effects

- 7.4.11 The methods outlined within the draft CoCP are considered effective at reducing traffic emissions, and therefore, no significant residual effects are anticipated.

Cumulative effects

- 7.4.12 This combined assessment has taken into account cumulative effects from background traffic growth, committed developments and impacts related to traffic emissions arising from the SES1 changes and AP1 amendments in this area and other community areas.
- 7.4.13 There will be no significant cumulative effects for air quality as a result of the combination of HS2 Phase 2a and the AP1 revised scheme.

7.5 Community

Scope, assumptions and limitations

- 7.5.1 The assessment scope, key assumptions and limitations for community are as set out in Volume 1 and the SMR of the main ES.
- 7.5.2 This assessment considers new or different significant construction effects only. Therefore, there is no operational assessment for community.

Environmental baseline

Existing environmental baseline

- 7.5.3 The baseline community information is as described in Section 6 of Volume 2, Community Area report: Hough to Walley's Green (MA01) of the main ES. A summary of the baseline information relevant to the assessment of the amendment is provided below.
- 7.5.4 Crewe comprises approximately 30,000 residential properties. The route of the original scheme passes underneath Crewe in tunnel. Crewe has several suburbs including Leighton, Maw Green, Sydney and Coppenhall Moss.
- 7.5.5 Oakfield Lodge School is a pupil referral unit and provides alternative education provision for children who are unable to attend mainstream school. Oakfield Lodge School is located 750m east of the route of the original scheme, and immediately adjacent to land required for this amendment.

Future baseline

- 7.5.6 The Planning data report of the main ES (see Volume 5, Appendix: CT-004-00000 of the main ES) provides details of committed developments assumed to have been implemented by 2025. This information has been supplemented by the committed developments listed in the equivalent Volume 5 Planning data report of the SES1 and AP1 ES (see SES1 and AP1 Volume 5, Appendix: CT-004-00000). These committed developments have been considered as a future baseline where relevant.
- 7.5.7 Committed developments of relevance to the community assessment that would materially alter the future baseline during construction of the AP1 revised scheme in this area, are set out in Section 5, Table 15.
- 7.5.8 The following committed developments have been included as part of the future baseline and considered within this assessment:
- the implementation of committed development MA01/448S will result in a new classroom and disabled toilet located immediately to the north of the land required for the construction of the AP1 revised scheme; and

- the implementation of committed development MA01/464A will result in seven permanent Gypsy and Traveller pitches located adjacent the land required for the construction of the AP1 revised scheme.

Effects arising during construction

Avoidance and mitigation measures

- 7.5.9 No avoidance or mitigation measures, additional to those reported in the main ES and draft CoCP, are required.

Assessment of impacts and effects

- 7.5.10 The AP1 revised scheme will result in a new moderate adverse in-combination effect at approximately 10 residential properties in the vicinity of Warmingham Road and Groby Road. As reported in the main ES, Warmingham Road is a construction traffic route and is expected to experience a significant increase in HGV traffic. This significant HGV traffic effect will combine with new noise and visual effects for approximately 18 months. Together, these noise, visual and HGV traffic effects will result in a new moderate adverse in-combination effect on amenity for residents at these properties, which is significant.
- 7.5.11 The main ES reported a major adverse in-combination effect on Oakfield Lodge School. Significant noise effects were expected to combine with significant HGV traffic effects for approximately three years and seven months. Alterations to the junction of Warmingham Road and Groby Road (AP1-001-004) will result in a new noise effect on the school building closest to the amendment location for approximately one year and seven months. The AP1 revised scheme will result in new significant visual effects on the school, and the HGV traffic effects reported in the main ES will remain the same. This will result in a different major adverse in-combination effect on Oakfield Lodge School, which is significant.

Other mitigation measures

- 7.5.12 No mitigation measures, additional to those reported in the main ES and draft Code of CoCP, have been identified.

Summary of likely residual significant effects

- 7.5.13 The AP1 revised scheme will result in a new temporary residual effect on approximately 10 residential properties in the vicinity of Warmingham Road and Groby Road as a result of HGV traffic effects and new noise and visual effects.
- 7.5.14 The AP1 revised scheme will result in a different temporary residual effect on Oakfield Lodge school as a result of noise, visual and HGV traffic effects.

Cumulative effects

- 7.5.15 No new, removed or different significant cumulative effects have been identified compared to the main ES.

7.6 Ecology and biodiversity

Scope, assumptions and limitations

- 7.6.1 The assessment scope, key assumptions and limitations for ecology and biodiversity are as set out in Volume 1 and the SMR of the main ES.
- 7.6.2 This assessment considers new or different significant permanent construction effects only. Therefore, there is no operational assessment for ecology and biodiversity.

Environmental baseline

Existing baseline

- 7.6.3 The baseline ecology and biodiversity information is as described in Section 7 of Volume 2, Community Area report: Hough to Walley's Green (MA01) of the main ES. A summary of the baseline information relevant to this assessment is provided below.

Designated sites

- 7.6.4 There are three statutory sites of international importance of relevance to the assessment of the AP1 revised scheme as follows:
- Midland Meres and Mosses Phase 1 Ramsar site of which three constituent SSSI were considered in the main ES: Wybunbury Moss SSSI in the Hough to Walley's Green area, and The Mere, Mere SSSI and Tatton Meres SSSI both in the Pickmere to Agden and Hulseheath area (MA03);
 - Midland Meres and Mosses Phase 2 Ramsar site, of which the closest constituent is Black Firs and Cranberry Bog. Oakhanger Moss SSSI, which is also a component of this Ramsar site, is also relevant to the Hough to Walley's Green area, and one further component of this Ramsar site, Oak Mere SSSI, is relevant to the Wimboldsley to Lostock Gralam area (MA02); and
 - West Midlands Mosses Special Area of Conservation (SAC), comprising four constituent SSSI (of which three are also part of the Midland Meres and Mosses Phase 1 Ramsar site and one is included in the Midland Meres and Mosses Phase 2 Ramsar site). The closest constituent SSSI is Wybunbury Moss SSSI.

7.6.5 There are three statutory sites of national importance of relevance to the assessment of the AP1 revised scheme, as follows:

- Wybunbury Moss SSSI, part of the Midland Meres and Mosses Phase 1 Ramsar site, is located 1.8km south-west of the land required for the construction of the AP1 revised scheme and at its closest point, is approximately 150m east of the B5071 Stock Lane and Main Road on which traffic will be redistributed as a result of the AP1 revised scheme;
- Black Firs and Cranberry Bog SSSI, part of the Midland Meres and Mosses Phase 2 Ramsar site, is located 2.6km south-east of the land required for the construction of the AP1 revised scheme and adjacent to and 75m south of the A531 Main Road and the B5500 Nantwich Road respectively, on which traffic will be redistributed as a result of the AP1 revised scheme. However, the AP1 revised scheme within the Hough to Walley's Green area is not within the IRZ for this SSSI; and
- Oakhanger Moss SSSI, part of Midland Meres and Mosses Phase 2 Ramsar site, is located 4.4km east of the land required for the construction of the AP1 revised scheme, and 120m west of the M6, which will be used by construction vehicles for the AP1 revised scheme.

Effects arising during construction

Avoidance and mitigation measures

7.6.6 No avoidance or mitigation measures additional to those reported in the main ES and draft CoCP are required.

Assessment of impacts and effects

Designated sites

7.6.7 The main ES reported that there would be no adverse effects on the Midland Meres and Mosses Phase 1 Ramsar site at any of the constituent SSSI of relevance to the original scheme. The AP1 revised scheme includes updated information on construction traffic (heavy duty vehicles and workforce vehicles) movements and diversionary effects to existing traffic during construction and operation. This has prompted a new assessment of the associated changes in air quality on the Midland Meres and Mosses Phase 1 Ramsar site at Wybunbury Moss SSSI and The Mere, Mere SSSI, which is reported in revised documents to inform a Habitats Regulations Assessment (HRA) for these sites. These HRA reports assess the impacts from oxides of nitrogen (NO_x) and acidification in addition to nitrogen deposition which was previously considered. They conclude there is no credible risk that NO_x, nitrogen deposition or acid deposition during either the construction or operation phases could undermine the conservation objectives of either Wybunbury Moss or The Mere, Mere (alone or in-combination). Therefore, although the scope of the air quality assessment has changed to include additional forms of pollution, there is no change to the

effects described in the main ES, and there remains no adverse effects on the integrity of the Midland Meres and Mosses Phase 1 Ramsar site, alone or in combination with other plans and projects.

- 7.6.8 The main ES reported that there would be no adverse effects on the West Midlands Mosses SAC, at any of the constituent SSSI of relevance to the original scheme. Increased deposition of pollution (NO_x, nitrogen deposition and acidification) associated with changes in traffic distribution is the only impact of relevance to the AP1 revised scheme. The closest component is Wybunbury Moss SSSI, which will not be adversely affected by changes in air quality as a result of the AP1 revised scheme, as detailed above in respect to Midland Meres and Mosses Phase 1 Ramsar site. The three other constituent SSSI of the SAC remain unaffected. Therefore, although the scope of the air quality assessment has changed to include additional forms of pollution, there is no change to the effects described in the main ES, and there remains no adverse effect on the integrity of the West Midlands Mosses SAC, alone or in combination with other plans and projects.
- 7.6.9 The main ES reported that there would be no adverse effects on Midland Meres and Mosses Phase 2 Ramsar site at any of the constituent SSSI of relevance to the original scheme. Increased deposition of pollution associated with construction traffic is the only impact of relevance to the AP1 revised scheme.
- 7.6.10 Oakhanger Moss, a component of the Midland Meres and Mosses Phase 2 Ramsar site, is located 120m west of the M6 in the Hough to Walley's Green area. The traffic data for the AP1 revised scheme on the M6 includes traffic movements required for construction, and the predicted increase in the volume of future baseline traffic (i.e., not associated with AP1 revised scheme), which will be greater than that used to inform the main ES. The assessment of changes in air quality for the AP1 revised scheme includes impacts from NO_x and acidification, as well as nitrogen deposition which was previously considered. The thresholds at which these pollutants could potentially result in harm to habitats for which the Ramsar site is designated were exceeded, either alone or in combination with other plans or projects. Therefore, further assessment of effect has been carried out to inform the HRA for this site. It demonstrates that the contribution of pollutants by the AP1 revised scheme alone and in combination are small and these are based on conservative assumptions. The impacts will be temporary and will not compromise the management carried out to achieve the site's conservation objectives.
- 7.6.11 The AP1 revised scheme does not result in changes to the assessment at two further components of the Midland Meres and Mosses Phase 2 Ramsar site. At Black Firs and Cranberry Bog SSSI, where the changes in traffic flows on nearby roads remains not significant and therefore adverse effects resulting from deposition of airborne pollution can be ruled out. It also remains the case that there will be no adverse effects from changes in air quality on the qualifying features of the Ramsar site at Oak Mere SSSI, which is located in the Wimboldsley to Lostock Gralam area (MA02).
- 7.6.12 Therefore, although the traffic model has been revised and the scope of the air quality assessment has changed to include additional forms of pollution, there remains no adverse

effects on the integrity of the Midland Meres and Mosses Phase 2 Ramsar site, alone or in combination with other plans and projects, as reported in the main ES.

- 7.6.13 Wybunbury Moss SSSI, a component part of the Midland Meres and Mosses Phase 1 Ramsar site and West Midlands Mosses SAC, is designated for wetland habitats that also form the reason for designation of the SAC and Ramsar sites. Consequently, in line with the documents to inform the Appropriate Assessment, additional airborne pollution caused by increases in traffic flows will not have any adverse effects on qualifying features. Therefore, adverse effects on the structure and function of the SSSI can be ruled out.
- 7.6.14 Black Firs and Cranberry Bog SSSI, a component part of the Midland Meres and Mosses Phase 2 Ramsar site, is also designated for wetland habitats that also form the reason for designation of the Ramsar site. As detailed above in respect to Midland Meres and Mosses Phase 2 Ramsar, significant effects resulting from airborne pollution can be ruled out. There will also be no significant effects on the groundwater regime. Therefore, there will be no adverse effects on the structure and function of the SSSI.
- 7.6.15 Oakhanger Moss SSSI, a component part of Midland Meres and Mosses Phase 2 Ramsar site, is also designated for wetland habitats that also form the reason for designation of the Ramsar site. As detailed above in respect to Midland Meres and Mosses Phase 2 Ramsar site, significant effects resulting from airborne pollution can be ruled out. Therefore, there will be no adverse effects on the structure and function of the SSSI.

Summary of likely residual significant effects

- 7.6.16 No new, removed or different significant cumulative effects have been identified compared to the main ES.

Other mitigation measures

- 7.6.17 No mitigation measures additional to those reported in the main ES and draft CoCP are required.

Cumulative effects

- 7.6.18 No cumulative effects on ecological receptors have been identified in the Hough to Walley's Green area.

7.7 Health

Scope, assumptions and limitations

- 7.7.1 The assessment scope, key assumptions and limitations for health are as set out in Volume 1 and the SMR of the main ES.

Environmental baseline

Existing baseline

- 7.7.2 The baseline community information is as described in Section 8 of Volume 2, Community Area report: Hough to Walley's Green (MA01) of the main ES. A summary of the baseline information relevant to the assessment of AP1 revised scheme is provided below.
- 7.7.3 Changes to the sound, noise and vibration assessment as a result of new construction traffic data have occurred in Crewe and Bradfield Green.
- 7.7.4 Crewe comprises approximately 30,000 residential properties. The route of the original scheme passes underneath Crewe in tunnel. Crewe has several suburbs including Leighton, Maw Green, Sydney and Coppenhall Moss.
- 7.7.5 Bradfield Green comprises approximately 40 residential properties. The nearest residential properties are located 570m west of the route of the original scheme.

Future baseline

- 7.7.6 The Planning data report of the main ES (see Volume 5, Appendix: CT-004-00000 of the main ES) provides details of committed developments assumed to have been implemented by 2025. This information has been supplemented by the committed developments listed in the equivalent Volume 5 Planning data report of the SES1 and AP1 ES (see SES1 and AP1 ES Volume 5, Appendix: CT-004-00000). These committed developments have been considered as a future baseline where relevant.
- 7.7.7 No committed developments of relevance for the health assessment have been identified that would materially alter the future baseline in this area.

Effects arising during construction

Avoidance and mitigation measures

- 7.7.8 No avoidance or mitigation measures, additional to those reported in the main ES, are required.

Assessment of impacts and effects

- 7.7.9 The main ES reported an adverse neighbourhood quality effect for residents along the B5076 North Street in Crewe. Significant HGV traffic effects were expected to combine with significant air quality effects. The AP1 revised scheme will remove the significant HGV and air quality effects. This will result in the removal of the neighbourhood quality effect for residents along the B5076 North Street.
- 7.7.10 The main ES reported an adverse neighbourhood quality effect for residents along the B5076 Bradfield Road in Crewe. Significant HGV traffic effects were expected to combine

with significant air quality effects. The AP1 revised scheme will remove the significant HGV and air quality effects. This will result in the removal of the neighbourhood quality effect for residents along the B5076 Bradfield Road.

- 7.7.11 The main ES reported an adverse neighbourhood quality effect for residents in the vicinity of Broughton Road, Coppenhall. Construction of the original scheme was expected to be visible from street level in the vicinity of Broughton Road, Coppenhall. Significant noise effects were expected to last for a period of approximately five years and six months during the daytime, two years and four months during the evening, and two years and six months during the night-time. Residents of properties in the vicinity were also expected to experience significant air quality effects, and traffic noise effects.
- 7.7.12 Broughton Road is a designated route for construction traffic. Significant air quality effects and significant traffic noise effects were expected to combine with significant noise and visual effects as reported in the main ES, and amended by AP-001-004. New construction traffic data and changes to the sound, noise and vibration assessment as a result of this new data, will remove the significant air quality and traffic noise effects. This will result in the removal of the neighbourhood quality effects for residents in the vicinity of Broughton Road, Coppenhall.
- 7.7.13 The main ES reported an adverse neighbourhood quality effect for residents along Sydney Road, Crewe. Sydney Road, Crewe, is a designated route for construction traffic and is expected to experience a significant increase in HGV traffic movements. Significant HGV traffic effects were expected to combine with significant traffic noise effects on residential properties on Sydney Road during the peak months of construction. Changes to the sound, noise and vibration assessment as a result of new construction traffic data will remove the significant traffic noise effect. These changes will result in the removal of the neighbourhood quality effect along Sydney Road, Crewe.
- 7.7.14 The main ES reported an adverse neighbourhood quality effect for residents along the A530 Middlewich Road in Bradfield Green. The A530 Middlewich Road, Bradfield Green, is a designated route for construction traffic and is expected to experience a significant increase in HGV traffic movements. Significant HGV traffic effects were expected to combine with significant traffic noise effects on residential properties on the A530 Middlewich Road during the peak months of construction. Changes to the sound, noise and vibration assessment as a result of new construction traffic data will remove the significant traffic noise effect. These changes will result in the removal of the neighbourhood quality effect along the A530 Middlewich Road, Bradfield Green.

Other mitigation measures

- 7.7.15 No mitigation measures, additional to those reported in the main ES and draft CoCP are identified.

Cumulative effects

- 7.7.16 No new, removed or different significant cumulative effects have been identified compared to the main ES.

7.8 Sound, noise and vibration

Scope, assumptions and limitations

- 7.8.1 The assessment scope, key assumptions and limitations for sound, noise and vibration are as set out in Volume 1 and the SMR of the main ES.

Environmental baseline

Existing baseline

- 7.8.2 In the Hough to Walley's Green area, the updated sound modelling described in Section 2 has resulted in updates to the existing baseline sound levels at receptors adjacent to Broughton Road and in the community of Copenhall. Further information on the updated baseline sound levels relevant to the assessment is provided in the SES1 and AP1 ES Volume 5, Appendix: SV-002-00000. Where no updates to the baseline sound levels are required, the baseline sound, noise and vibration information is as described in Section 13 of Volume 2, Community Area report: Hough to Walley's Green (MA01) of the main ES.

Future baseline

- 7.8.3 The Planning data report of the main ES (see Volume 5, Appendix: CT-004-00000 of the main ES) provides details of committed developments assumed to have been implemented by 2025. This information has been supplemented by the committed developments listed in the equivalent Volume 5 Planning data report of the SES1 and AP1 ES (see SES1 and AP1 ES Volume 5, Appendix: CT-004-00000). These committed developments have been considered as a future baseline where relevant.
- 7.8.4 The developments have been considered to determine whether they would result in a material change to the future baseline or have the potential to give rise to cumulative effects. None of the identified developments affect the assessment of sound, noise and vibration for the AP1 revised scheme.
- 7.8.5 Updates have also been made to future baseline sound levels at the locations identified in the existing baseline section above where updates to the existing baseline sound levels have been made for the SES1 and AP1 ES.

Effects arising during construction

Avoidance and mitigation measures

- 7.8.6 No avoidance or mitigation measures, additional to those reported in the main ES and draft CoCP, are required.

Assessment of impacts and effects

Residential receptors: indirect effects

- 7.8.7 The main ES identified a likely significant indirect construction effect on a community basis at approximately 25 residential receptors along Sydney Road between Crewe Green Roundabout and the railway overbridge. This was denoted as MA01-C-C5 in Table 8 in Volume 5, Appendix: SV-002-0MA01 of the main ES. The AP1 revised scheme reduces both the average and peak monthly construction road traffic movements on these roads, and thus reduces the associated construction traffic noise levels. For further information see SES1 and AP1 ES Volume 5, Appendix: SV-002-00000. The reduction in construction traffic noise levels will remove the likely indirect residual significant effect reported in the main ES on dwellings along Sydney Road between Crewe Green Roundabout and the railway overbridge.
- 7.8.8 The main ES identified a likely significant indirect construction effect on a community basis at approximately 100 residential receptors along Landsdowne Road between Sydney Road and Coleridge Way. This was denoted as MA01-C-C6 in Table 8 in Volume 5, Appendix: SV-002-0MA01 of the main ES. The AP1 revised scheme reduces both the average and peak monthly construction road traffic movements on these roads, and thus reduces the associated construction traffic noise levels. For further information see SES1 and AP1 ES Volume 5, Appendix: SV-002-00000. The reduction in construction traffic noise levels will remove the likely indirect residual significant effect reported in the main ES on dwellings along Landsdowne Road between Sydney Road and Coleridge Way.
- 7.8.9 The main ES identified a likely significant indirect construction effect on a community basis at approximately 70 residential receptors along Limetree Avenue between Elm Drive and Acer Avenue. This was denoted as MA01-C-C7 in Table 8 in Volume 5, Appendix: SV-002-0MA01 of the main ES. The AP1 revised scheme reduces both the average and peak monthly construction road traffic movements on these roads, and thus reduces the associated construction traffic noise levels. For further information see SES1 and AP1 ES Volume 5, Appendix: SV-002-00000. The reduction in construction traffic noise levels will remove the likely indirect residual significant effect reported in the main ES on dwellings along Limetree Avenue between Elm Drive and Acer Avenue. The main ES identified a likely significant indirect construction effect on a community basis at approximately 70 residential receptors along Broughton Road. This included approximately 15 dwellings associated with committed development (MA01/210). This was denoted as MA01-C-C8 in Table 8 in Volume 5, Appendix: SV-002-0MA01 of the main ES. In combination with the adverse noise effect caused by

construction traffic, the main ES identified approximately 20 residential receptors located immediately adjacent to the road, which were forecast to experience direct adverse construction noise effects on a community basis, three of which were also forecast to experience direct adverse vibration effects. This was denoted as MA01-C-C2 in Table 5 in Volume 5, Appendix: SV-002-0MA01 of the main ES. The AP1 revised scheme reduces both the average and peak monthly construction road traffic movements on these roads, and thus reduces the associated construction traffic noise levels. For further information see SES1 and AP1 ES Volume 5, Appendix: SV-002-00000. The reduction in construction traffic noise levels will remove the likely indirect residual significant effect reported in the main ES on dwellings along Broughton Road. The likely direct residual significant effect reported in the main ES on dwellings along Broughton Road will also be removed.

- 7.8.10 The main ES identified a likely significant indirect construction effect on a community basis at approximately 30 residential receptors along the A530 Middlewich Road between the B5076 Flowers Lane and St Peter's Church. This was denoted as MA01-C-C9 in Table 8 in Volume 5, Appendix: SV-002-0MA01 of the main ES. The AP1 revised scheme reduces both the average and peak monthly construction road traffic movements on these roads, and thus reduces the associated construction traffic noise levels. For further information see SES1 and AP1 ES Volume 5, Appendix: SV-002-00000. The reduction in construction traffic noise levels will remove the likely indirect residual significant effect reported in the main ES on dwellings along the A530 Middlewich Road between the B5076 Flowers Lane and St Peter's Church.
- 7.8.11 As a result of the AP1 revised scheme, construction traffic is likely to cause adverse noise effects on residential receptors adjacent to Waldron's Lane between Warmingham Road and Stoneley Road and along Stoneley Road between Groby Road and Waldron's Lane. Approximately 25 dwellings located along Waldron's Lane and Stoneley Road are forecast to experience a change in road traffic noise levels of up to around 4dB $L_{pAeq,0700-2300}$ during the peak months, due to traffic diverting away from construction routes on nearby roads. The main ES did not identify an indirect noise effect along this road; therefore this is considered to be a new likely significant effect on a community basis at the dwellings on these roads, denoted as MA02-C-C12 in Volume 5, Appendix: SV-002-0MA02. This temporary adverse effect represents a change in the acoustic character of the area, which may be perceived as a change in the quality of life for that community.

Other mitigation measures

- 7.8.12 No mitigation measures additional to those reported in the main ES and draft CoCP are required.

Summary of likely residual significant effects

- 7.8.13 As a result of the AP1 revised scheme, construction traffic in this area will give rise to a new likely temporary residual adverse significant noise effect on residential dwellings on

Waldron's Lane between Warmingham Road and Stoneley Road, and on Stoneley Road between Groby Road and Waldron's Lane.

Cumulative effects

- 7.8.14 This combined assessment has taken into account cumulative effects from background traffic growth, committed developments and traffic related to construction works arising from the AP1 revised scheme in this area and other community areas.

7.9 Water resources and flood risk

Scope, assumptions and limitations

- 7.9.1 This assessment considers any new or different significant effects on water quality in local waterbodies from:
- accidental spillages and routine discharge of surface runoff from new road diversions/realignment resulting from the AP1 revised scheme;
 - changes to spillage risk on the existing road network due to increases in HGV movements resulting from construction traffic; and
 - changes to the quantity and quality of routine runoff discharged from the existing road network due to changes in daily traffic movements resulting from the construction of the AP1 revised scheme.
- 7.9.2 The assessment scope, key assumptions and limitations for water resources and flood risk are as set out in Volume 1 and the SMR of the main ES.

Environmental baseline

Existing environmental baseline

- 7.9.3 The baseline water resources and flood risk information is as described in Section 15 of Volume 2, Community Area report: Hough to Walley's Green (MA01) of the main ES.

Future baseline

- 7.9.4 The Planning data report of the main ES (see Volume 5, Appendix: CT-004-00000 of the main ES) provides details of committed developments assumed to have been implemented by 2025. This information has been supplemented by the committed developments listed in the equivalent Volume 5 Planning data report of the SES1 and AP1 ES (see SES1 and AP1 ES Volume 5, Appendix: CT-004-00000). The developments have been considered to determine whether they would result in a material change to the future baseline or have the potential to give rise to cumulative effects. None of the identified developments affect the assessment of the SES scheme's likely construction and operation impacts on water resources and flood risk.

Effects arising during construction

Avoidance and mitigation measures

- 7.9.5 The avoidance and mitigation measures specific to water resources and flood risk are set out in Volume 2 Community Area report: Hough to Walley's Green (MA01) of the main ES. No avoidance or mitigation measures, additional to those reported in the draft CoCP and elsewhere in the main ES are required.

Assessment of impacts and effects

Temporary effects

- 7.9.6 At locations where highway drainage is discharged to local watercourses and there is a significant change in traffic due to construction (such that set thresholds are exceeded), assessments are required to determine whether routine runoff and spillage risk are likely to have detrimental impacts on water quality. These assessments are carried out using the Highways England Water Risk Assessment Tool (HEWRAT)³³. The assessments have been repeated following the main ES using the combined changes to traffic flows and have identified the following permanent new or different significant effects.
- 7.9.7 The main ES reported a temporary precautionary moderate effect, which was significant, on the Basford Brook and Tributary of Basford Brook 4 due to routine runoff from construction traffic on David Whitby Way realignment. The changes to construction traffic flows mean that there is no longer a need for construction routine runoff assessments of pollution risk for David Whitby Way. Therefore, the significant moderate effects on Basford Brook and Tributary of Basford Brook 4 have been removed.
- 7.9.8 There are no other new, different or removed significant effects compared to those reported in the main ES.

Permanent effects

- 7.9.9 There are no other new, different or removed significant effects compared to those reported in the main ES.

Summary of likely residual significant effects

- 7.9.10 There will be no other new residual significant effects resulting from the combined effects of SES1 changes and AP1 amendments in the Hough to Walley's Green area due to changes in traffic flows.

³³ Standards for Highways (2020), Design Manual for Roads and Bridges (DMRB), LA 113 Road Drainage and the Water Environment Revision 1 (formally HD 45/09). Available online at: <https://www.standardsforhighways.co.uk/dmrb/search/d6388f5f-2694-4986-ac46-b17b62c21727>.

7.10 Summary of new or different likely residual significant effects as a result of combined effects due to changes in traffic flows

Construction

Traffic and transport

- 7.10.1 The temporary residual significant effects during construction remain as described above. These effects will be temporary and reversible in nature lasting only for the duration of the construction works.
- 7.10.2 The AP1 revised scheme will result in the following changes to the congestion and delay effects for vehicle occupants, as reported in the main ES:
- new major adverse effect on two junctions;
 - new moderate adverse effect on two junctions;
 - new minor adverse effect on three junctions;
 - different (increased) major adverse significant effect on one junction;
 - change (increase) from moderate adverse effect to major adverse effect on four junctions;
 - change (increase) from minor adverse effect to moderate adverse effect on three junctions;
 - change (decrease) from major adverse effect to moderate adverse effect on two junctions;
 - change (decrease) from major adverse effect to minor adverse effect on one junction;
 - change (decrease) from moderate adverse effect to minor adverse effect on four junctions; and
 - change (decrease) from major adverse effect to moderate beneficial effect on one junction.
- 7.10.3 The AP1 revised scheme will result in the following changes to the traffic-related severance effects for non-motorised users, as reported in the main ES:
- new major adverse effect on two roads;
 - new moderate adverse effect on eight roads;
 - new minor adverse effect on four roads;
 - different (increased) major adverse significant effects on five roads;
 - change (increase) from moderate adverse effect to major adverse effect on two roads;
 - different (decreased) major adverse significant effects on three roads;
 - change (decrease) from moderate adverse effect to minor adverse effect on one road;

- change (decrease) from major adverse effect to moderate adverse effect on four roads; and
- change (decrease) from major adverse effect to minor adverse effect on two roads.

Air quality

- 7.10.4 The methods outlined within the draft CoCP are considered effective at reducing traffic emissions, and therefore, no significant residual effects are anticipated.

Community

- 7.10.5 The AP1 revised scheme will result in a new temporary residual effect on approximately 10 residential properties in the vicinity of Warmingham Road and Groby Road as a result of HGV traffic effects and new noise and visual effects.
- 7.10.6 The AP1 revised scheme will result in a different temporary residual effect on Oakfield Lodge school as a result of noise, visual and HGV traffic effects.

Sound, noise and vibration

- 7.10.7 As a result of the AP1 revised scheme, construction traffic in this area will give rise to a new likely temporary residual adverse significant noise effect on residential dwellings on Waldron's Lane between Warmingham Road and Stoneley Road, and on Stoneley Road between Groby Road and Waldron's Lane.

Operation

- 7.10.8 There are no changes to the likely significant effects during operation identified in the main ES as a result of the SES1 changes and AP1 amendments.

7.11 Summary of likely residual significant effects that will be removed as a result of combined effects due to changes in traffic flows

Construction

Traffic and transport

- 7.11.1 The AP1 revised scheme will remove significant adverse effects on 11 junctions (two major, five moderate, four minor) to the congestion and delay effects for vehicle occupants, as reported in the main ES.

- 7.11.2 The AP1 revised scheme will remove significant adverse effects on 37 roads (20 major and 17 moderate) to the traffic-related severance effects for non-motorised users, as reported in the main ES.

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