

# HIGH SPEED RAIL (LONDON - WEST MIDLANDS)

## Supplementary Environmental Statement and Additional Provision 2 Environmental Statement

Volume 2 | Community forum area report  
CFA7 | Colne Valley

July 2015

SES and AP2 ES 3.2.1.7



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Department  
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# Structure of the HS2 Supplementary Environmental Statement and Additional Provision 2 Environmental Statement

The Supplementary Environmental Statement (SES) and Additional Provision 2 Environmental Statement (AP2 ES) comprises:

- non-technical summary (NTS). This provides a summary in non-technical language of the SES (Part 1) and AP2 ES (Part 2) and of any likely significant environmental effects, both beneficial and adverse, which are new or different to those reported in the High Speed Two (HS2) Phase One Environmental Statement (ES) submitted to Parliament in November 2013 in support of the hybrid Bill ('the Bill') for Phase One of HS2 (hereafter referred to as 'the main ES') and, where relevant, the AP ES submitted in September 2014 (hereafter referred to as 'the AP1 ES');
- Volume 1: introduction to the SES and the AP2 ES. This introduces the supplementary environmental information and design changes included within the SES and amendments which have resulted in the need to amend the Bill within the AP2 ES. It also explains any changes to the scope, methodology, assumptions and limitations required for the environmental impact assessment;
- Volume 2: community forum area (CFA) reports and map books. These describe the supplementary environmental information and design changes included within the SES (Part 1), amendments within the AP2 ES (Part 2) and report any new or different likely significant environmental effects arising from these changes in each CFA compared to those reported in the main ES and, where relevant, the AP1 ES. The main local alternatives that have been considered are described, where relevant;
- Volume 3: route-wide effects. This reports new or different likely significant route-wide effects arising from the supplementary environmental information and design changes included within the SES (Part 1) and amendments within the AP2 ES (Part 2) compared to those reported in the main ES and, where relevant, the AP1 ES;
- Volume 4: off-route effects. This reports new or different likely significant off-route effects arising from the amendments within the AP2 ES compared to those reported in the main ES and, where relevant, the AP1 ES;
- Volume 5: appendices and map books. This contains supporting environmental information and associated maps; and

- glossary of terms and list of abbreviations. This contains any new or different terms and abbreviations used throughout the SES and AP2 ES compared to those included in the main ES and AP1 ES.

# Structure of this report

This volume of the SES and AP2 ES is divided into CFA reports, which are in turn divided into two parts.

Part 1 provides supplementary environmental information relating to:

- new baseline information with respect to European Protected Species surveys undertaken since the submission of the Bill and additional cultural heritage and ecology data relating to ancient woodlands;
- changes to the design or construction assumptions which do not require changes to the Bill; and
- corrections to the main ES.

Part 1 includes, where relevant:

- a description of the changes or updates within the CFA that have triggered the need for reassessment;
- an assessment of the environmental effects of the changes for relevant environmental topics considering the:
  - scope, assumptions and limitations of the SES assessment;
  - changes of relevance to the assessment;
  - environmental baseline;
  - effects arising during construction;
  - effects arising from operation; and
  - mitigation and residual effects; and
- a summary of any new or different likely residual significant effects as a result of the changes.

Part 2 provides environmental assessment information relating to proposed amendments to the design, which have resulted in the need to alter the powers conferred by the Bill. The following is included, where relevant:

- a summary of the proposed amendments within each CFA that have triggered the need for reassessment;
- a description of each amendment;
- an assessment of the environmental effects of each amendment for relevant environmental topics considering the:
  - scope, assumptions and limitations of the AP2 ES assessment;
  - environmental baseline;
  - effects arising during construction;



- effects arising from operation; and
- mitigation and residual effects; and
- a summary of any new or different likely residual significant effects as a result of each proposed amendment.

# 1 Introduction

- 1.1.1 The Bill for High Speed Rail between London and the West Midlands was submitted to Parliament together with the main ES in November 2013. The AP1 ES, which was submitted in September 2014, contained generally minor amendments to the design of the original scheme (i.e. the scheme submitted in November 2013). The Bill and associated Additional Provisions to the Bill, if enacted by Parliament, will provide the powers to construct, operate and maintain Phase One of HS2.
- 1.1.2 Since the submission of the main ES and AP1 ES, a number of changes or updates to environmental information and scheme design or assumptions have occurred, which may lead to new or different significant effects. These effects, depending on the type of change, are reported in the SES (Part 1) or AP2 ES (Part 2) of this document.
- 1.1.3 The SES contains updated environmental baseline information and scheme information relating to changes that have occurred within the current limits and powers of the Bill, and therefore do not require an Additional Provision to the Bill. This includes:
- additional environmental baseline information;
  - changes to the design or construction assumptions which do not require changes to the Bill; and
  - corrections to the main ES.
- 1.1.4 The changes are described in Part 1 under a series of sub-headings and assessed on a topic by topic basis using the same approach adopted in the main ES.
- 1.1.5 The purpose of the SES is to provide an assessment of any new or different likely significant environmental effects arising from the changes described.
- 1.1.6 The AP2 ES reports 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 amendments assessed within the AP2 ES for this CFA include:
- access arrangements: amendments to the locations, alignments and/or width of some access tracks proposed by the original scheme;
  - roads and Public Rights of Way (PRoW): changes to the locations of temporary diversions or permanent realignments; and
  - utilities: changes to the amount of land required temporarily for works to pylons and overhead power lines.
- 1.1.8 The AP2 ES assesses each amendment separately for all relevant topics. The purpose of the AP2 ES is to provide an assessment of any new or different likely significant environmental effects arising from the amendments.

- 1.1.9 The standard measures that will be used to mitigate likely significant adverse environmental effects during construction and operation of the scheme are described in the main ES, Volume 1, Section 9 and the draft Code of Construction Practice (CoCP) submitted in support of the Bill. Implementation of these measures has been assumed in this SES and AP2 ES.
- 1.1.10 It should be noted that, since submission of the Bill, the scheme design has been revised by SES design changes, amendments described in the AP1 ES (AP1 amendments) and amendments described in the AP2 ES (AP2 amendments).
- In order to differentiate between the original proposals and subsequent changes, the following terms are used:
  - 'the original scheme' - the Bill scheme submitted to Parliament in November 2013, which was assessed in the main ES;
  - 'the AP1 revised scheme' - the original scheme as amended by the AP submitted in September 2014;
  - 'the SES scheme' - the original scheme with the design changes described in the SES; and
  - 'the AP2 revised scheme' - the original scheme as amended by the SES scheme and AP2.<sup>1</sup>

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This is considered further in Section 3<sup>1</sup>

# Part 1: Supplementary Environmental Statement

## 2 Summary of changes

### 2.1 New environmental baseline information

#### Cultural heritage

- 2.1.1 A further review of the ancient woodland inventory published by Natural England has been carried out to identify woodlands that have been added to the inventory since production of the main ES (September 2013).
- 2.1.2 A summary of supplementary cultural heritage information from this source that is relevant to the SES assessment is provided in Section 3.2 under 'Cultural heritage'.

#### Ecology

- 2.1.3 Surveys for bats, great crested newt and otter have been undertaken in the Colne Valley area (CFA7) since September 2013. The updated ancient woodland inventory has been reviewed to identify woodlands that have been formally added to the inventory since September 2013. In addition, a habitat survey has been undertaken at selected woodland locations to assist in determining if these areas are ancient woodland.
- 2.1.4 Details of all survey work and desk-study information gathered since September 2013 that is relevant to this area are provided in SES and AP2 ES, Volume 5, Appendix EC-001-002 and Volume 5 map series EC-04 and EC-05.
- 2.1.5 A summary of supplementary ecological information that is relevant to the SES assessment are included within Section 3.3. This consists solely of changes relating to the status of ancient woodland.
- 2.1.6 SES and AP2 ES, Volume 5, Appendix EC-002-002 provides a summary of additional baseline survey data collected since September 2013 that has resulted in no change to the conclusions of the main ES. SES and AP2 ES, Volume 5, Appendix EC-003-002 identifies additional local/parish level effects that will occur as a consequence of SES changes but which are not significant.

### 2.2 Changes to the design or construction assumptions not requiring a change to the Bill

- 2.2.1 There are no changes to the design or construction assumptions in CFA7 not requiring a change to the Bill that result in a new or different significant effect.

## Changes to the design or construction assumptions in other CFAs affecting this CFA

- 2.2.2 As a result of design changes in other CFAs, in particular the removal of the sustainable placement area at Hunt's Green Farm in the Dunsmore, Wendover and Halton area (CFA 10), there are changes to the movement of excavated material that alter HGV traffic flows on roads in CFA7 in comparison to the original scheme.
- 2.2.3 However, the changes in HGV flows do not give rise to any new or different significant effects in relation to traffic and transport in this CFA compared to the original scheme. Therefore, an assessment is not presented in Section 3.
- 2.2.4 Traffic flows on the A40 Western Avenue, B467 Swakeleys Road and Harvil Road (which form the boundary between the South Ruslip to Ickenham area (CFA6) and CFA7) are affected by changes to the movement of excavated material to and from CFA6. The effects of these were reported within both Volume 2, CFA6 and CFA7 of the main ES. For the purpose of clarity, the effects upon these roads on traffic and transport are now solely reported in Volume 2, CFA6 of the SES and AP2 ES. The effects on air quality and community receptors in CFA7 are reported in Section 3 of this report.
- 2.2.5 The use of Euro VI<sup>2</sup> HGVs for the movement of excavated materials in the London Low Emission Zone (refer to SES-006-003) and an update of the West London Highway Assignment Model (WeLHAM) have also been considered in Section 3.

## 2.3 Corrections to the main ES

- 2.3.1 Since submission of the Bill, the need for a number of corrections in the contents of the main ES has been identified. Table 1 provides a list of those instances where there has been a need to correct the Volume 2 CFA report for Colne Valley because of the potential to alter the significant environmental effects reported in the main ES or a factual inaccuracy relating to significant effects has been identified. The table gives the location of the correction in the main ES, the reason for the correction, replicates the text from the main ES, where applicable provides revised text, and identifies whether the correction changes a significant effect reported in the main ES. Where relevant, these corrections have been taken into account in the technical assessments contained within Section 3 of this SES.

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<sup>2</sup> Euro VI engines are required to have substantially lower emissions of NO<sub>x</sub> and particulate matter than older engines

Table 1: Summary of corrections to the main ES in CFA7

Reference in the main ES	Reason for correction	Text in the main ES	Revised text	Change to significant effects and mitigation
<p>Traffic and transport</p> <p>Paragraph 12.4.13, Volume 2, CFA7 of the main ES</p>	<p>A minor adverse effect during construction is reported for the junction of A412 Denham Way with Chalfont Lane, with regard to delay and congestion to vehicle users. However, this should have been reported as a moderate adverse effect.</p>	<p>First bullet point:</p> <p>A412 Denham Way with Chalfont Lane (minor adverse effect).</p>	<p>First bullet point:</p> <p>A412 Denham Way with Chalfont Lane (moderate adverse effect).</p>	<p>Yes.</p> <p>Significant residual effect on congestion and delay to vehicle users changed from minor adverse to moderate adverse. See map TR-03-051 in the SES and AP2 ES, Volume 2, CFA7 Map Book.</p> <p>No additional mitigation, other than that mentioned in the main ES, is required.</p>
<p>Air quality</p> <p>Section 4.4, Volume 2, CFA7 of the main ES.</p> <p>Traffic inputs used in the construction assessment, reported in Volume 5, TR-001-000, Annex D, Table 21, of the main ES</p>	<p>The original method to derive Annual Average Daily Traffic (AADT) from peak hour traffic flows was incorrect in this CFA. The HS2 construction HGV flows were overstated.</p>	<p>Properties on Swakeleys Road between Harvil Road and the A40 are expected to experience temporary substantial adverse impacts related to Nitrogen Dioxide (NO<sub>2</sub>) concentrations during construction that will be significant.</p>	<p>The change in the assessment is reported in Section 3.</p>	<p>Yes.</p> <p>There will no longer be any significant residual effects as a result of this correction in combination with the following factors: traffic flow changes due to the updated WeLHAM; flow reductions due to the review and rescheduling of construction traffic (refer to SES-006-001 in SES and AP2 ES, Volume 2, CFA6); and emissions reductions due to the use of Euro VI<sub>3</sub> HGVs (SES-006-003) for transporting excavated material.</p> <p>No additional mitigation, other than that reported in the main ES, is required.</p>
<p>Community</p> <p>Section 5.4.4, Volume 2, CFA7 of the main ES</p>	<p>Changes to the air quality assessment due to corrections to the AADT flows.</p>	<p>Residents on B467 Swakeleys Road (between the junction with the A40 and the junction with Harvil Road) are predicted to experience in-combination effects from traffic, air quality and noise. These effects are significant effects due to an increase in HGV movements from construction</p>	<p>Residents on B467 Swakeleys Road (between the junction with the A40 and the junction with Harvil Road) are predicted to experience in-combination effects from traffic and noise. These effects are significant effects due to an increase in HGV</p>	<p>Yes.</p> <p>There will be a different significant residual effect on community due to removal of the air quality effect on Swakeleys Road. However, this will not change the level of significance of the community effect reported in the main ES i.e. it remains major adverse.</p>

<sup>3</sup> Euro VI engines are required to have substantially lower emissions of NO<sub>x</sub> and particulate matter than older engines.

Reference in the main ES	Reason for correction	Text in the main ES	Revised text	Change to significant effects and mitigation
		traffic.	movements from construction traffic.	No additional mitigation, other than that reported in the main ES, is required.

## **2.4 Topics included in the SES assessment**

- 2.4.1 The changes described above in Sections 2.1 to 2.3 are not considered to require a reassessment of the environmental effects or proposed mitigation as set out in the main ES with respect to: agriculture, forestry and soils; community; land quality; landscape and visual assessment; socio-economics; sound, noise and vibration; traffic and transport; and water resources and flood risk assessment. However, there are changes where reassessment is considered to be required in respect of: air quality; cultural heritage; and ecology.



## 3 Assessment of changes

### 3.1 Air quality

#### Introduction

- 3.1.1 This section of the report describes the environmental baseline in relation to air quality that is relevant to the assessment. It then identifies any new or different likely significant environmental effects as a result of the changes introduced in Section 2, compared to the original scheme.

#### Scope, assumptions and limitations

- 3.1.2 The assessment scope, key assumptions and limitations for air quality are as set out in Volume 1, the Scope and Methodology Report (SMR) (Volume 5: Appendix CT-001 - 000/1) and the SMR Addendum (Volume 5: Appendix CT-001-000/2) of the main ES as amended by the SMR Addendum 2 (Volume 5: Appendix CT-001 -000/3) of the SES and AP2 ES.
- 3.1.3 In order to help mitigate impacts on local air quality, in areas where there is action in place to meet EU limit values through the introduction of Low Emission Zones (such as the London Low Emission Zone), HS2 Ltd will require HGVs transporting excavated material and entering these designated zones during construction, to be powered by Euro VI (or lower emission) engines.

#### Changes of relevance to this assessment

- 3.1.4 The following changes have been assessed:
- the update of the WeLHAM model;
  - update of the traffic flows following correction to the method to convert from peak hour flows to AADT for construction traffic;
  - review of material import and construction programme in CFA6 ( refer to SES-006-001 in SES and AP2 ES, Volume 2, CFA6); and
  - the use of Euro VI HGVs for the movement of excavated materials in the London Low Emission Zone (refer to SES-006-003 in SES and AP2 ES, Volume 2, CFA6) and the other compounds outside the low emission zone accessed via Swakeleys Road.
- 3.1.5 The update of the WeLHAM model has resulted in an update both to construction traffic flows and to the future baseline traffic flows, from which the future baseline air quality is predicted. The assessment of air quality impacts from construction traffic depends on both the predictions for the construction scenario and the future baseline case.
- 3.1.6 The HS2 HGV construction traffic flows used in the air quality assessment were overstated for the main ES. This, in turn, had the effect of overstating air quality impacts and the input data have since been revised.

## Environmental baseline

### *Existing baseline*

- 3.1.7 The baseline air quality information for Colne Valley is described in the main ES (Volume 2, CFA7, Section 4 and Volume 5: Appendix AQ-001-007). Details of the assessed receptors are provided within Volume 5: Appendix AQ-001-007 of the main ES.

### *Future baseline*

#### **Construction (2017)**

- 3.1.8 Future background pollutant concentrations have therefore been sourced from the Department for Environment, Food and Rural Affairs (Defra) background maps for 2017. These maps predict that NO<sub>2</sub> and PM<sub>10</sub> concentrations in 2017 will be lower than the 2012 baseline.
- 3.1.9 The future baseline air quality conditions for 2017 have been updated to reflect updates in the Defra maps and changes in the WeLHAM traffic model.

#### **Operation (2026)**

- 3.1.10 The future baseline air quality conditions for 2026 have been updated to reflect updates in the Defra maps and changes in the WeLHAM traffic model.

## Effects arising during construction

### *Avoidance and mitigation measures*

- 3.1.11 The use of HGVs powered by Euro VI (or lower emission) engines during construction, for the purposes of transporting excavated material, will reduce emissions of NO<sub>x</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> relative to that assumed in the main ES.

### *Assessment of impacts and effects*

#### **Temporary effects**

- 3.1.12 In the main ES, adverse effects on air quality were predicted at some residential receptors alongside roads used by construction traffic vehicles.
- 3.1.13 In this revised assessment, as a result of the combination of factors referred to in paragraph 3.1.4, it is predicted that the significant air quality effects identified in the main ES are removed. The assessment supporting the conclusions of this assessment can be found in SES and AP2 ES, Volume 5: Appendix AQ-001-007.
- 3.1.14 Therefore, the significant effects reported in the main ES at a number of receptors on Swakeleys Road, between Harvil Road and the A40 will be removed.

#### **Permanent effects**

- 3.1.15 There are no permanent effects anticipated to arise during construction of the SES scheme.

### *Other mitigation measures*

- 3.1.16 No other mitigation measures during construction are required in relation to air quality (i.e. in addition to those identified in the main ES).

### *Cumulative effects*

- 3.1.17 There are no new or different likely significant cumulative effects for air quality as a result of the SES changes acting in combination with AP1 amendments, or as a result of any relevant committed developments.

### *Summary of likely residual significant effects*

- 3.1.18 The SES scheme will remove all significant effects on air quality reported in the main ES.

### **Effects arising from operation**

- 3.1.19 There are no changes in operation as a result of the SES scheme and consequently no new or different significant effects compared to those reported in the main ES.

## **3.2 Cultural heritage**

### **Introduction**

- 3.2.1 This section of the report describes the environmental baseline in relation to cultural heritage that is relevant to the assessment. It then identifies any new or different likely significant environmental effects as a result of the changes introduced in Section 2, compared to the original scheme and also compared to any relevant AP1 amendments. Consideration is given to effects upon the value of heritage assets, including effects on their setting, as a result of the changes.

### **Scope, assumptions and limitations**

- 3.2.2 The assessment scope, key assumptions and limitations for cultural heritage are as set out in Volume 1, the SMR (Volume 5: Appendix CT-001 -000/1) and the SMR Addendum (Volume 5: Appendix CT-001-000/2) of the main ES.

### **Changes of relevance to this assessment**

- 3.2.3 The identification of an additional area of Ranston Covert and Battlesford Wood as ancient woodland is the only change relevant to the assessment.

### **Environmental baseline**

#### *Existing baseline*

- 3.2.4 The cultural heritage baseline for the assessment takes into account information collected for the main ES. This included walk-over survey, geophysical survey, remote-sensing data, and data from national and local registers. A full list of heritage assets is provided in Volume 2, Section 6.3 of the main ES. The baseline has been updated following a review of the ancient woodland inventory published by Natural England to identify woodlands that have been added to the inventory since production of the main ES.

- 3.2.5 A summary of the baseline information relevant to the assessment of new or different effects is provided below. For those assets described in the main ES, further details are provided in the baseline reports, gazetteer of heritage assets, impact assessment tables and survey reports in Volume 5 of the main ES and are shown on maps CH-01 (Heritage Assets within Sandy Area), CH-02 (Designated Heritage Assets) and CH-03 (Archaeological Character Sub-Zones).

### **Designated assets**

- 3.2.6 An additional area of ancient woodland within Ranston Covert and Battlesford Wood (asset reference<sup>4</sup> CVA045) has been added to the ancient woodland inventory by Natural England since the main ES. This asset is of high heritage value.

### **Non-designated assets**

- 3.2.7 No new non-designated assets that are relevant to this assessment have been identified in the Colne Valley area.

### *Future baseline*

#### **Construction (2017)**

- 3.2.8 Volume 5, Appendix CT-004-000 of the SES and AP2 ES provides details of the developments that are assumed to have been implemented by 2017, additional to those identified in the main ES.
- 3.2.9 None of the identified developments affect the assessment of the SES scheme's likely construction impacts on cultural heritage.

#### **Operation (2026)**

- 3.2.10 Volume 5: Appendix CT-004-000 of the SES and AP2 ES provides details of the developments that are assumed to have been implemented by 2026, additional to those identified in the main ES.
- 3.2.11 None of the identified developments affect the assessment of the SES scheme's likely operational impacts on cultural heritage.

### **Effects arising during construction**

#### *Avoidance and mitigation measures*

- 3.2.12 Measures to avoid or mitigate significant effects on cultural heritage are provided in the draft CoCP (main ES, Volume 5: Appendix CT-003-000). These provisions include:
- management measures that will be implemented for assets that are to be retained within the land required for the construction of the SES scheme (draft CoCP, Section 8);
  - the preparation of project-wide principles, standards and techniques for works affecting heritage assets (draft CoCP, Section 8); and

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<sup>4</sup> Asset references refer to the gazetteer of heritage assets in Volume 5 of the main ES.

- a programme of archaeological investigation and recording to be undertaken prior to, or during, construction works affecting the assets (draft CoCP, Section 8).

### *Assessment of impacts and effects*

#### **Permanent effects**

- 3.2.13 Ranston Covert and Battlesford Wood (asset reference CVA045) lie partially within the land required for the original scheme. The main ES reported that approximately 1ha of the ancient woodland, an asset of high value, would be removed during construction of the original scheme. This would constitute a low adverse impact resulting in a moderate adverse effect.
- 3.2.14 Due to the change in status, this will result in a loss of 1.7ha, 70% of ancient woodland. There will be a different significant effect with a high adverse impact and major adverse effect.

#### *Other mitigation measures*

- 3.2.15 There are no additional mitigation measures (i.e. in addition to those identified in the main ES).

#### *Cumulative effects*

- 3.2.16 There are no new or different likely cumulative effects for cultural heritage as a result of the SES changes acting in combination with AP1 amendments, or as a result of any relevant committed development.

#### *Summary of likely residual significant effects*

- 3.2.17 The new designation will give rise to a different residual major adverse significant effect with the loss of 70% of the ancient woodland in Ranston Covert and Battlesford Wood (asset reference CVA045). Where reasonably practicable HS2 will seek to reduce the extent of ancient woodland affected at this location.

#### **Effects arising from operation**

- 3.2.18 The identification of an additional area of Ranston Covert and Battlesford Wood as ancient woodland will not give rise to a new or different significant effect on cultural heritage during operation and will not change the level of significance of the effects reported in the main ES.

#### **Volume 5 amendments**

- 3.2.19 Table 2 sets out the additions to the main ES, Volume 5, Appendix CH-002-007. Table 3 sets out the additions to the main ES, Volume 5, Appendix CH-003-007.

Table 2: Additions to Volume 5, Appendix CH-002-007, Cultural Heritage - gazetteer of heritage assets

Unique ID	Map references	Asset type	Name	Description	Period	Designation	Grade	Significance/ value	NHL reference	HER reference
CVA045	CH-01-023	Ancient woodland	Ranston Covert and Battlesford Wood	<p>Ancient and semi-natural woodland. A surviving remnant of more extensive forest as part of the mosaic of other surviving ancient woodland in the surrounding landscape. Its value lies in its potential for well preserved archaeological remains of woodland management and industries typical of woodland such as wood banks, saw pits, quarries and small settlements. They can also preserve features of earlier periods.</p> <p>The setting of the woodland is not a contributing factor to the value since ancient woodland is nearly always a surviving fragment of a much larger, since lost, landscape hence the non-wooded surrounds are rarely contemporary.</p>	N/A	Ancient Woodland	N/A	High	N/A	N/A

Table 3: Additions to Volume 5, Appendix CH-003-007, Cultural Heritage - impact assessment tables

Unique identification	Name	Designation(s)	Value	Construction impact			Operation impact			New or different environmental effect from that reported in the main ES or the Additional Provision (AP <sub>1</sub> ) ES
				Nature of impact including mitigation	Scale of impact	Effect	Nature of impact including mitigation	Scale of impact	Effect	
CVA072	Ranston Covert and Battlesford Wood	Ancient woodland	High	The woodland lies partially within the land required for the original scheme. Due to the change in status of the woodland, it will now result in the loss of 1.7ha (70%) of ancient woodland altering the value of the asset.	High adverse	Major adverse	The construction effect remains and there will be no further impact	No change	Neutral	This is a different significant effect as an additional area of ancient woodland has been included on the Natural England inventory since production of the main ES.

## 3.3 Ecology

### Introduction

- 3.3.1 This section of the report describes the environmental baseline in relation to ecology that is relevant to the assessment. It then identifies any new or different likely significant environmental effects as a result of the changes introduced in Section 2, compared to the original scheme and also compared to any relevant AP1 amendment. Consideration is given to the potential for impacts on species, habitats and sites designated on the basis of their importance for nature conservation.

### Scope, assumptions and limitations

- 3.3.2 The assessment scope for ecology is as set out in Volume 1 of the SES and AP2 ES. The key assumptions and limitations, and the methodology for determining significance of effects are as set out in Volume 1, the SMR (Volume 5: Appendix CT-001-000/1) and the SMR Addendum (Volume 5: Appendix CT-001-000/2) of the main ES.
- 3.3.3 To address any limitations in data, a precautionary baseline has been considered according to the guidance reported in the main ES, Volume 5: Appendix CT-001-000/2. This constitutes a 'reasonable worst-case' basis for the subsequent assessment. The precautionary approach to the assessment that has been adopted identifies the likely significant ecological effects of the SES scheme.

### Changes of relevance to this assessment

- 3.3.4 Updates to Natural England's ancient woodland inventory since submission of the main ES are the only changes relevant to the assessment.

### Environmental baseline

#### *Existing baseline*

- 3.3.5 The ecological baseline for the assessment takes into account baseline information collected for the main ES, which included field survey data, aerial photography and relevant existing information gathered from national organisations and from regional and local sources. A full list is provided in the main ES, Volume 2, CFA7, Section 7.1.
- 3.3.6 The assessment also takes into account additional desk-study and survey information collected since September 2013. Further information has also been obtained from Natural England.
- 3.3.7 A summary of the baseline information relevant to the assessment is provided below. Further details of all baseline information obtained since September 2013 is provided in Volume 5: Appendix EC-001-002. For those receptors described in the main ES, further details are provided in Volume 2, CFA7, Section 7.3 and in Volume 5, including maps EC-01 to EC-12 of the main ES.

#### *Designated sites*

- 3.3.8 Mid-Colne Valley Site of Special Scientific Interest (SSSI) is designated for a diverse assemblage of breeding birds associated with woodland and wetland and for



wintering waterfowl. It also includes large areas of open water, an area of chalk grassland at Coppermill Down and semi-natural broadleaved woodland. Ranston Covert and Battlesford Wood, part of which is ancient woodland, comprises the largest extent of woodland in the SSSI. The updates to the ancient woodland inventory have resulted in a reduction in the extent of ancient woodland in the SSSI of approximately 0.7ha, from approximately 3ha to 2.3ha. The boundary of the ancient woodland within the larger area of woodland to the west of the River Colne has also changed. The SSSI is identified in the main ES as being of national value.

- 3.3.9 A small (0.26ha) unnamed woodland approximately 500m north-west of Ranston Covert and Battlesford Wood has been added to the ancient woodland inventory since submission of the main ES. Little Halings Wood (2.48ha), which is 1.1km north-west of Ranston Covert and Battlesford Wood and is adjacent to an area of land required for ecological compensation, has also been added to the inventory since submission of the main ES.

### *Habitats*

- 3.3.10 Ancient woodland in the Mid-Colne Valley SSSI is of county/metropolitan value, as reported in the main ES. Its value is unchanged despite the decrease in the extent of ancient woodland at Ranston Covert and Battlesford Wood from 3ha to 2.3ha.
- 3.3.11 Other woodlands that are adjacent or close to the land required for construction and which were not reported in the main ES, but which have since been added to the ancient woodland inventory, are considered to form part of the ancient woodland resource valued at a county/metropolitan level in the main ES.

### *Protected and/or notable species*

- 3.3.12 There has been no change to the baseline information relating to species receptors set out in Volume 2, CFA7, Section 7.3 of the main ES.

### *Future baseline*

#### **Construction (2017)**

- 3.3.13 Volume 5, Appendix CT-004-000 of the SES and AP2 ES provides details of the developments that are assumed to have been implemented by 2017, additional to those identified in the main ES.
- 3.3.14 None of the identified developments affect the assessment of the SES scheme's likely construction impacts on ecology.

#### **Operation (2026)**

- 3.3.15 Volume 5: Appendix CT-004-000 of the SES and AP2 ES provides details of the developments that are assumed to have been implemented by 2026, additional to those identified in the main ES.
- 3.3.16 None of the identified developments affect the assessment of the SES scheme's likely operational impacts on ecology.

## Effects arising during construction

### *Avoidance and mitigation measures*

- 3.3.17 The assessment assumes implementation of the measures set out within the draft CoCP (Volume 5: Appendix CT-003-000 of the main ES), which includes translocation of protected species where appropriate.

### *Assessment of impacts and effects*

#### **Designated sites**

- 3.3.18 The main ES states that permanent adverse effects on the integrity of the Mid-Colne Valley SSSI will be significant at the national level. The main ES reports the loss of 1ha of ancient woodland from the site. Since the main ES, there have been substantive changes to the boundaries of areas recognised as ancient woodland within the SSSI. These revisions result in a net reduction in the extent of ancient woodland within the SSSI boundary. However, the area of ancient woodland within Ranston Covert and Battlesford Wood that falls within the land required for the original scheme has increased by 0.7ha to a total of 1.7ha. The change in status of the woodland will therefore result in a different significant effect on the Mid-Colne Valley SSSI. However, this will not change the level of significance of the effects reported in the main ES.

#### **Habitats**

- 3.3.19 The main ES states that the loss of approximately 1ha of ancient woodland from Ranston Covert and Battlesford Wood will result in a permanent adverse effect on its conservation status that will be significant at the county/metropolitan level. Changes to the ancient woodland inventory mean that an additional 0.7ha of ancient woodland from Ranston Covert and Battlesford Wood (as described in relation to designated sites above) is within the land required for construction of the SES scheme. This loss will result in a different permanent adverse effect on the conservation status of ancient woodland. However, this will not change the level of significance of the effects reported in the main ES.
- 3.3.20 In addition, there is an area of approximately 25m<sup>2</sup> of ancient woodland within the small unnamed area north-west of Ranston Covert. In view of the fact that this unnamed woodland has acquired ancient woodland status, no works will be undertaken within this woodland.

#### **Protected and/or notable species**

- 3.3.21 There will be no new or different significant effects on protected and/or notable species.

### *Cumulative effects*

- 3.3.22 There are no new or different likely cumulative effects for ecology as a result of the SES changes acting in combination with AP1 amendments, or as a result of any relevant committed development.

### *Other mitigation measures*

- 3.3.23 There is a requirement for additional measures to address the loss of an additional 0.7ha of ancient woodland at Ranston and Battlesford Wood (within the Mid-Colne Valley SSSI). Appropriate measures are expected to be brought forward either in a subsequent AP or by direct agreement with landowners. As stated in the main ES, where appropriate soil translocation, planting of native tree and shrub species and translocation of coppice stools and dead wood will be used, as appropriate, as compensation measures. Ancient woodland is irreplaceable.

### *Summary of likely residual significant effects*

- 3.3.24 The mitigation, compensation and enhancement measures described in the main ES reduce the effect to a level that is not significant, except for the loss of ancient woodland. The additional loss of approximately 0.7ha of ancient woodland from Ranston Covert and Battlesford Wood will result in a different adverse residual effect that is significant at the county/metropolitan level, given that ancient woodland is an irreplaceable resource. Where reasonably practicable HS2 will seek to reduce the extent of ancient woodland affected at this location.

### **Effects arising from operation**

- 3.3.25 The identification of new areas of ancient woodland will not give rise to a new or different significant effect on ecology during operation and will not change the level of significance of the effects reported in the main ES.

# Part 2: Additional Provision 2 Environmental Statement

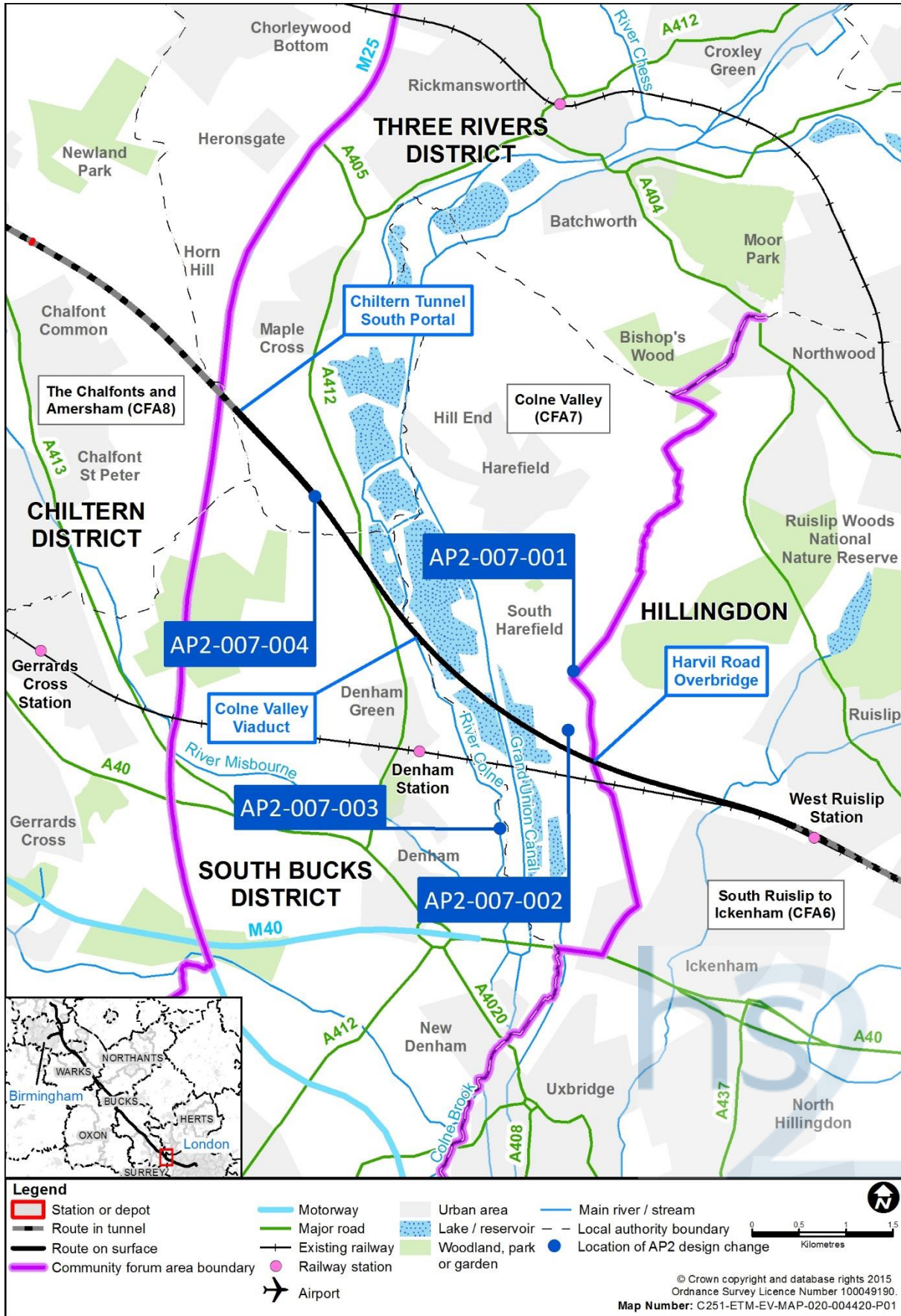
## 4 Summary of amendments

- 4.1.1 Table 4 provides a summary of the amendments in the Colne Valley CFA (CFA7) and Figure 1 shows the locations.
- 4.1.2 It should be noted that construction of the Heathrow Express Depot in Langley (amendment reference AP2-000-001) will result in an increase in HGV flows on the A412, south of M40 junction 1, and on the M40, west of M40 junction 1. However, this increase in HGV flow does not give rise to any new or different significant effects in CFA7. The assessment of this amendment is reported in the SES and AP2 ES, Volume 4.

Table 4: Summary of amendments in CFA7

Name of amendment	Description of the original scheme or AP1 revised scheme	Description of the AP2 revised scheme
<p>Air rights required for utility works at Hillingdon</p> <p>AP2-007-001</p>	<p>The permanent diversion of the 275kV overhead transmission lines at the Colne Valley viaduct. As part of this work the transmission lines between the pylons either side of Lower Lodge south of Breakspear Road and 50m east of Harvil Road would be restrung. Lower Lodge is outside the limits of land required for the diversion.</p>	<p>The permanent provision of rights to enable cranes to swing above Lower Lodge during construction and maintenance i.e. 'air rights'.</p>
<p>Additional land required for the revised alignment of the diverted 275kV overhead cables</p> <p>AP2-007-002</p>	<p>The permanent diversion of 275kV overhead cables from their original alignment (50m north of the Hillingdon Outdoor Activity Centre (HOAC)) to a new alignment which would cross the original scheme east of Harvil Road. This would involve the removal of three steel frame electricity pylons and the installation of five new pylons (in CFA7).</p>	<p>The permanent diversion of 275kV overhead cables along a revised alignment. The location of four of the diverted pylons has been amended. An additional pylon will also be installed adjacent to the proposed National Grid Feeder Station. An additional area of land is also required temporarily to provide a working area around two of the diverted pylons. The provision of this working area is outside the limits of the Bill.</p>
<p>Additional land required for the realignment of a construction access at Buckinghamshire Golf Club</p> <p>AP2-007-003</p>	<p>The provision of a temporary construction route across Buckinghamshire Golf Course to the location of the overhead cable diversion works on the east side of the River Colne.</p>	<p>The provision of a realigned temporary construction route to avoid the Golf Course club house.</p>
<p>Temporary closure of Bridleway Rickmansworth 004</p> <p>AP2-007-004</p>	<p>The permanent provision of an overbridge up to approximately 1m above the existing ground level, providing a realignment of Tilehouse Lane and Bridleway Rickmansworth 004 over the route.</p>	<p>Bill powers to temporarily stop up Bridleway Rickmansworth 004 are required. This is a Bill correction only.</p>

Figure 1: Locations of amendments in CFA7



## 5 Assessment of amendments

### 5.1 Air rights required for utility works (AP2-007-001)

- 5.1.1 The Bill provides for the permanent diversion of the 275kV overhead transmission lines at the Colne Valley viaduct. As part of this work the transmission lines between the pylons either side of Lower Lodge south of Breakspear Road and 50m east of Harvil Road would be restrung. Lower Lodge is outside the limits of land required for the diversion (refer to the map CT-05-019b-R1 in the main ES, Volume 2, CFA7 Map Book).
- 5.1.2 Since submission of the Bill, the requirement for permanent rights to enable cranes to swing above Lower Lodge during construction and maintenance has been identified i.e. 'air rights' (see maps CT-05-019b-R1 and CT-06-019b-R1 in the SES and AP2 ES, Volume 2, CFA7 Map Book).
- 5.1.3 Air rights at this property are outside the original limits of the Bill, hence the need for this amendment.
- 5.1.4 The air rights required are not considered to make changes that require a reassessment of the effects or proposed mitigation as set out in the main ES with respect to any environmental topic.

### 5.2 Additional land required for the revised alignment of the diverted 275kV overhead cables (AP2-007-002)

- 5.2.1 The Bill provides for the permanent diversion of the pylons and 275kV overhead power lines from the existing alignment (50m north of the HOAC) to a new alignment. The power lines would cross the HS2 route east of the realigned Harvil Road, in the South Ruislip to Ickenham area (CFA6), having been diverted along the southern side of the Chiltern Main Line across the Uxbridge Golf Course, over the realigned Harvil Road, northwards over the HS2 route and then back in a north-westerly direction to the National Grid feeder station north-east of HOAC. This would involve the removal of five steel frame electricity pylons and the installation of seven new pylons, including two new pylons in CFA6 (refer to the main ES maps CT-05-019b, CT-05-019b-R1, CT-05-019b-L1, CT-06-019b, CT-06-019b-R1 and CT-06-019b-L1 in the Volume 2, CFA7 Map Book).
- 5.2.2 Since submission of the Bill, the need to alter the alignment of this permanent diversion has been identified, due to further design development. The location of four of the diverted pylons has therefore been amended. An additional pylon will also be installed adjacent to the proposed National Grid feeder station. An additional area of approximately 0.5ha of land will also be required temporarily to provide a working area around two of the diverted pylons that will lie south of the Chiltern Main Line and west of the existing alignment of Harvil Road (see grid references F3, G3 and F4, map CT-05-019b-L1 in SES and AP2 ES, Volume 2, CFA 7 Map Book). The additional land required is outside the original limits of the Bill, hence the need for this amendment.
- 5.2.3 The works within the additional land require the stripping of vegetation and removal of topsoil. The diversion works are currently planned to start as part of advance works and are expected to take approximately three months to complete, which is the same



as in the original scheme. Topsoil will be temporarily stored adjacent to the working area and will be used to reinstate the area once construction is complete.

- 5.2.4 The altered position of the pylons, additional pylon and land requirement in CFA7 are not considered to make changes that require a reassessment of the environmental effects or proposed mitigation as set out in the main ES with respect to: agriculture, forestry and soils; air quality; land quality; landscape and visual assessment; socio-economics; sound, noise and vibration; traffic and transport; and water resources and flood risk assessment. However, there were changes where reassessment was considered to be required in respect of: community; cultural heritage; and ecology.

## Community

### *Scope, assumptions and limitations*

- 5.2.5 The assessment scope, key assumptions and limitations for community are set out in Volume 1, the SMR (Volume 5: Appendix CT001-000/1) and the SMR Addendum (Volume 5: Appendix CT-001-000/2) of the main ES.

### *Existing baseline*

- 5.2.6 The community baseline is as described in the main ES (see CFA7, Section 5). The land required for the amendment is on Uxbridge Golf Course.

### *Effects arising during construction*

- 5.2.7 The main ES reported no significant community effect for Uxbridge Golf Course from the original scheme. The AP2 revised scheme includes a requirement for approximately 0.5ha of additional land from the golf course to be used temporarily as part of the works to divert the overhead cables. The relatively contained nature of the works, the short timescale of work at this specific location and the alignment of the works in relation to the existing golf course fairways (i.e. parallel to fairways, rather than crossing them) means that there is predicted to be some temporary disruption to the functioning of the course. However, this will be short-term and will not result in a new or different significant effect in comparison with the main ES and the AP1 ES.

### *Effects arising from operation*

- 5.2.8 The revised alignment for the diverted 275kV overhead cables will not give rise to a new or different significant effect and will not change the level of significance of the effects reported in the main ES and the AP1 ES.

### *Mitigation and residual effects*

- 5.2.9 There will be no change to the mitigation and residual effects reported in Volume 2 of the main ES.

### *Cumulative effects*

- 5.2.10 There are no new or different likely significant cumulative effects for community as a result of the amendment acting in combination with another amendment in AP2, or in AP1, or as a result of any relevant committed development interacting with the AP2 revised scheme.



## Cultural heritage

### *Scope, assumptions and limitations*

- 5.2.11 The assessment scope, key assumptions and limitations for cultural heritage are set out in Volume 1, the SMR (Volume 5: Appendix CT001-000/1) and the SMR Addendum (Volume 5: Appendix CT-001-000/2) of the main ES.

### *Existing baseline*

- 5.2.12 The cultural heritage baseline for the assessment takes into account information collected for the main ES, which included walk-over survey, geophysical survey, remote-sensing data, and data from national and local registers. A full list is provided in Volume 2, Section 6.3 of the main ES.
- 5.2.13 The additional land required for the amendment does not include any designated sites or heritage assets. The historic route of the Great Western and Great Central Joint Railway (asset reference CVA20) is 210m to the north of the land required for the amendment, with the Uxbridge High Street Branch Railway (asset reference CVA003) 220m to the west. Both are of low heritage value. Archaeological potential is indicated by Mesolithic activity 220m to the north of the revised alignment for the diverted 275kV overhead cables, next to Dews Farm (asset reference CVA21), which is of moderate heritage value.
- 5.2.14 The baseline resources are described in the main ES (see CFA 7, Section 6 and Volume 5, Appendix CH-001-007).

### *Effects arising during construction*

- 5.2.15 No significant construction effects on cultural heritage from the permanent diversion of the pylons and 275kV overhead power lines were reported in the main ES. The land required for the revised overhead cable alignment does not encroach on any heritage assets or alter their setting.
- 5.2.16 The revised alignment for the diverted 275kV overhead cables will not give rise to a new or different significant effect on cultural heritage during construction and will not change the level of significance of the effects reported in the main ES and the AP1 ES.

### *Effects arising from operation*

- 5.2.17 No significant operation effects on cultural heritage from the permanent diversion of the pylons and 275kV overhead power lines were reported in the main ES.
- 5.2.18 The revised alignment for the diverted 275kV overhead cables will not give rise to a new or different significant effect on cultural heritage during operation and will not change the level of significance of the effects reported in the main ES and the AP1 ES.

### *Mitigation and residual effects*

- 5.2.19 There will be no change to the mitigation and residual effects reported in Volume 2 of the main ES.

### *Cumulative effects*

- 5.2.20 There are no new or different likely significant cumulative effects for cultural heritage as a result of the amendment acting in combination with another amendment in AP2, or in AP1, or as a result of any relevant committed development interacting with the AP2 revised scheme.

## **Ecology**

### *Scope, assumptions and limitations*

- 5.2.21 The assessment scope for ecology is as set out in Volume 1 of the SES and AP2 ES. The key assumptions and limitations, and the methodology for determining significance of effects are as set out in Volume 1, the SMR (Volume 5: Appendix CT-001-000/1) and the SMR Addendum (Volume 5: Appendix CT-001-000/2) of the main ES.
- 5.2.22 To address any limitations in data, a precautionary baseline has been considered according to the guidance reported in the main ES, Volume 5: Appendix CT-001-000/2. This constitutes a 'reasonable worst-case' basis for the subsequent assessment. The precautionary approach to the assessment that has been adopted identifies the likely significant ecological effects of the AP2 revised scheme.

### *Existing baseline*

- 5.2.23 The ecological baseline of the land required for the amendment has been based on: field data collated for the main ES; additional survey work for bats and great crested newt undertaken from April 2014 to October 2014; aerial photography; and relevant existing information gathered from national organisations and from regional and local sources including: Buckinghamshire and Milton Keynes Environmental Records Centre; Herts and Middlesex Wildlife Trust ; Hertfordshire Biological Records Centre; Greenspace Information for Great London; Hertfordshire Bird Club; and the London, Essex and Hertfordshire Amphibian and Reptile Trust.
- 5.2.24 A summary of the baseline information relevant to the assessment of the amendment is provided below. This takes account of any relevant new or updated baseline information provided in SES and AP2 ES, Volume 5, Appendix EC-001-002. For those receptors described in the main ES, further details are provided in Volume 2, CFA7, Section 7.3 and in Volume 5, including maps EC-01 to EC-12.

## **Designated sites**

- 5.2.25 The Mid-Colne Valley Site of Metropolitan Importance (SMI) is partially in the land required for the revised alignment of the diverted 275kV overhead cables. The SMI is a large site (321ha) and designated for riparian habitat with a diverse assemblage of aquatic and wetland plants, species-rich grassland and wet woodland. It is also designated for breeding and wintering water birds, invertebrates, water vole and harvest mouse. This site is of county/metropolitan value, as reported in the main ES.
- 5.2.26 The land required for the revised alignment passes through Fray's Valley Local Nature Reserve (LNR) (71.8ha). Denham Quarry Park LNR (29ha) is within 380m of the land required for the amendment and Denham Country Park LNR (19ha) is 500m from it. Fray's Valley LNR and Denham Country Park LNR are designated for woodland,

grassland, scrub and wetland habitats and are both also in the larger Mid-Colne Valley SMI. Denham Quarry Park LNR is designated for wetland birds, invertebrates and grassland habitat and is partly in the Mid-Colne Valley SMI. The main ES reports that these LNRs are each of district/borough value.

5.2.27 The following four Sites of Borough Importance (SBI) grade 1 or grade 2 (SBI.I or SBI.II) are relevant to the assessment. Each is of district/borough value:

- Brackenburg Railway Cutting SBI.II is approximately 250m east of the land required for the amendment. It is within CFA6 to the south of the Chiltern Main Line, east of Harvil Road, and is designated for broadleaved woodland.
- Harefield Hall and The Lodge SBI.II is designated for broadleaved woodland and is partially within the land required for the amendment.
- Dew's Dell SBI.I is approximately 550m north of the land required for the amendment. It is designated for broadleaved woodland with small areas of species-rich grassland.
- Newyears Green SBI.II is approximately 470m north-east of the land required for the amendment. It is within CFA6 and is designated for broadleaved woodland.

### Habitats

5.2.28 Broadleaved woodland in Fray's Valley LNR is within land required for the amendment. As reported in the main ES, this habitat is of district/borough value. In addition, the main ES states that broadleaved woodland at Brackenburg Railway Cutting SBI.II, Harefield Hall and The Lodge SBI.II and Newyears Green SBI.II is of district/borough value. The broadleaved woodland habitat near Harefield No. 2 Lake is likely to be wet woodland dominated by alder and willows, which may qualify as a habitat of principal importance and is assessed as being of up to district/borough value. The semi-natural broadleaved woodland at Dew's Dell may qualify as a habitat of principal importance and is assessed as being of district/borough value.

5.2.29 As reported in the main ES, the hedgerows located west of Harvil Road may qualify as important hedgerows (Natural Environment and Rural Communities (NERC) Act, 2006)<sup>5</sup>. However, they do not form a continuous network and have limited extent in the wider landscape. The hedgerows are therefore of local/parish value.

5.2.30 A 0.5ha area of semi-improved grassland with scattered scrub and trees (the northern reaches of Uxbridge Golf Course) is required temporarily for the realignment. As stated in the main ES, this habitat is of local/parish value.

5.2.31 Denham Quarry Lake, which is south of Chiltern Main Line and located in the Mid-Colne Valley SMI is within the land required for the amendment. As reported in the main ES, this habitat is of local/parish value.

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<sup>5</sup> Natural Environment and Rural Communities Act 2006 (Chapter 16). London. Her Majesty's Stationery Office.

### **Protected and/or notable species**

- 5.2.32 The main ES reports that the grassland, scrub, ponds and ditches associated with the Uxbridge Golf Course may support a population of great crested newt. As part of the precautionary assessment, the main ES assumed the area supports a breeding metapopulation, which is of up to county/metropolitan value.
- 5.2.33 The main ES reports that the grassland and scrub around Uxbridge Golf Course may support a population of reptiles. If the area supports a population of adder or a high numbers of grass snake or common lizard, the area would be of up to county/metropolitan value, as reported in the main ES.
- 5.2.34 The main ES reports that the Mid-Colne Valley SMI has a diverse assemblage of breeding birds including those associated with Harefield No. 2 Lake. The lake is also important for wintering species and is stated as being of county/metropolitan value.
- 5.2.35 The main ES identified a diverse assemblage and high abundance of bat species using the wider landscape for foraging and commuting. Within the land required for the amendment, the main ES identifies suitable bat roosting habitat in Dew's Dell SBI and the hedgerow network in the wider area that may be used by bats to commute to foraging sites. The bat assemblage in land around Harvil Road is of up to county/metropolitan value.
- 5.2.36 The main ES states that habitats around Harefield No. 2 Lake are likely to be highly suitable for breeding otter. Otter may be using terrestrial habitats within and adjacent to the land required for the amendment and are therefore relevant to the assessment. If present, the otter population is likely to be of up to county/metropolitan value.

### *Future baseline*

#### **Construction (2017)**

- 5.2.37 Volume 5, Appendix CT-004-000 of the SES and AP2 ES provides details of the developments that are assumed to have been implemented by 2017, additional to those identified in the main ES.
- 5.2.38 None of the identified developments affect the assessment of the AP2 revised scheme's likely construction impacts on ecology.

#### **Operation (2026)**

- 5.2.39 Volume 5: Appendix CT-004-000 of the SES and AP2 ES provides details of the developments that are assumed to have been implemented by 2026, additional to those identified in the main ES.
- 5.2.40 None of the identified developments affect the assessment of the SES scheme's likely operational impacts on ecology.

### *Effects arising during construction*

#### **Avoidance and mitigation measures**

- 5.2.41 The assessment assumes implementation of the measures set out within the draft CoCP (Volume 5: Appendix CT-003-000 of the main ES), which includes translocation of protected species where appropriate.

### Designated sites

- 5.2.42 The main ES reported that habitat loss within the Mid-Colne Valley SMI (321ha) and Fray's Valley LNR (71.8ha) will result in a permanent adverse effect on site integrity that is significant at the county/metropolitan level and district/borough respectively. The realignment of the overhead power lines within this amendment will result in an additional loss of approximately 500m<sup>2</sup> from the same location at both sites. In both cases this is a small increase to the area required for the original scheme. The amendment and resulting loss of habitat will therefore result in a different significant effect on the integrity of the SMI and the LNR. However, this will not change the level of significance of the effects reported in the main ES.
- 5.2.43 No adverse effects on Harefield Hall and The Lodge SBI.II (11.2ha) were reported in the main ES. The amendment will require removal of approximately 700m<sup>2</sup>, which equates to approximately 6% of the site, as a working area around two pylons. The amendment will result in an adverse effect on the site integrity of Harefield Hall and The Lodge SBI.II that is significant at the district/borough level. This is a new significant effect which is not reported in the main ES.
- 5.2.44 It is unlikely that the amendment will result in any other new or different significant effects on other designated sites, beyond those reported in the main ES and the AP1 ES.

### Habitats

- 5.2.45 The main ES reported that approximately 30ha of the woodland will be lost as part of the original scheme, of which approximately 4ha is from Fray's Valley LNR. These losses would result in permanent adverse effects that are significant at the county/metropolitan level for woodlands in the Mid-Colne Valley SSSI and Mid-Colne Valley SMI and at the district/borough level for other areas of woodland. An additional 500m<sup>2</sup> of broadleaved woodland that is in the LNR is required for the realignment. The amendment will therefore increase the extent of loss, which will result in a different significant effect on woodland. However, this will not change the level of significance of the effects reported in the main ES.
- 5.2.46 It is unlikely that the amendment will result in any other new or different effects on habitat receptors of relevance at more than the local/parish level.

### Protected and/or notable species

- 5.2.47 The main ES identifies that the original scheme could result in a permanent adverse effect on the conservation status of great crested newt (if present) in the vicinity of Uxbridge Golf Course that would be significant at up to the county/metropolitan level. The amendment will not remove any possible breeding ponds but will result in the removal of an additional 0.5ha of grassland and 500m<sup>2</sup> of woodland. The amendment will therefore result in a different significant effect on the conservation status of great crested newt. However, this will not change the level of significance of the effects reported in the main ES.
- 5.2.48 The main ES identifies that the original scheme could result in a permanent adverse effect on the conservation status of reptiles (if present) in the vicinity of Uxbridge Golf Course that would be significant at up to the county/metropolitan level. The

vegetation clearance required by the amendment will result in the removal of an additional 0.5ha of grassland, parts of which may be suitable for these species. The amendment will therefore result in a different significant effect on the conservation status of reptiles. However, this will not change the level of significance of the effects reported in the main ES.

- 5.2.49 It is unlikely that the amendment will result in any other new or different effects on species receptors of relevance at more than the local/parish level.

### **Cumulative effects**

- 5.2.50 This amendment will require removal of 500m<sup>2</sup> of habitat from the Mid-Colne Valley SMI and a further 0.5ha will be removed for the realignment of a construction access at Buckinghamshire Golf Club (refer to AP2-007-003). Due to the large extent of this site and the small area of loss from both amendments (approximately 0.2% of the site's area) no significant cumulative effects are likely.

### **Mitigation and residual effects**

#### *Other mitigation measures*

- 5.2.51 Large areas of compensatory woodland and grassland are provided in CFA 7 as part of the original scheme. The habitats within the land required for the amendment will also be reinstated, where practicable, post-construction. Based on the small scale of the additional habitat losses (approximately 0.1ha) including that suitable for great crested newt and reptiles, no additional mitigation measures (i.e. in addition to those identified in the main ES) are required.

#### *Summary of likely residual effects*

- 5.2.52 With the implementation of the mitigation measures proposed in the main ES, the different ecological effects arising from the revised alignment for the diverted 275kV overhead cables are reduced to a level where they are not significant. The significant effects of the AP2 revised scheme in this area are therefore unchanged from those reported in the main ES and the AP1 ES.

#### *Effects arising from operation*

- 5.2.53 The revised alignment for the diverted 275kV overhead cables will not give rise to a new or different significant effect on ecology during operation and will not change the level of significance of the effects reported in the main ES and the AP1 ES.

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

- 5.2.54 The revised alignment for the diverted 275kV overhead cables does not change the level of significance of the environmental effects or proposed mitigation as set out in the main ES (Volume 2, CFA,) and the AP1 ES (Volume 2, CFA7).

## **5.3 Additional land required for the realignment of a construction access at Buckinghamshire Golf Club (AP2-007-003)**

- 5.3.1 The Bill provides for a temporary construction route for utilities to the location of the overhead cable diversion works in Denham Country Park. The construction route was

along Denham Court Drive, across Buckinghamshire Golf Course and past the club house, along the west bank of the River Colne and east across the River Colne via a temporary bridge (refer to maps CT-05-019b-L1 and CT-05-019b-L2 in main ES Volume 2, CFA7 Map Book). The AP1 ES also includes an amendment to the existing access through Buckinghamshire Golf Club for utility works (refer to AP1-007-001 in AP1 ES, Volume 2, Section 2).

- 5.3.2 Since submission of the Bill and the AP1 ES, an opportunity to realign the temporary construction route for utilities to avoid disruption to the golf course and club house has been identified. Access will be provided along Denham Court Drive, via an existing golf course car park, and then across the River Colne on a new temporary bridge, along the edge of the golf course driving range and into Denham Country Park (refer to map CT-05-019b-L1 and CT-05-019b-L2 in the SES and AP2 ES, Volume 2, CFA7 Map Book). The temporary bridge included in the original scheme and the amendment included in AP1 (AP1-007-001) are no longer proposed.
- 5.3.3 The diversion works are currently planned to start as part of advance works and are expected to take approximately six months to complete, which is the same as in the original scheme. Approximately 0.9ha of land outside the original limits of the Bill is required, hence the need for this amendment.
- 5.3.4 The rerouted construction access is not considered to make changes that require a reassessment of the environmental effects or proposed mitigation as set out in the main ES with respect to: agriculture, forestry and soils; air quality; community; land quality; landscape and visual assessment; socio-economics; sound, noise and vibration; and traffic and transport. However, there were changes where reassessment was considered to be required in respect of: cultural heritage; ecology; and water resources and flood risk assessment.

## Cultural heritage

### *Scope, assumptions and limitations*

- 5.3.5 The assessment scope, key assumptions and limitations for cultural heritage are set out in Volume 1, the SMR (Volume 5: Appendix CT001-000/1) and the SMR Addendum (Volume 5: Appendix CT-001-000/2) of the main ES.

### *Existing baseline*

- 5.3.6 The cultural heritage baseline for the assessment takes into account information collected for the main ES, which included walk-over survey, geophysical survey, remote-sensing data, and data from national and local registers. A full list is provided in Volume 2, Section 6.3 of the main ES.
- 5.3.7 The land required temporarily for the amendment does not include any designated sites or heritage assets. Denham Court (asset reference CVA007) is located approximately 220m to the north-west, along with the following associated structures: the walled garden (asset reference CVA011), a bridge entrance (asset reference CVA008) and two footbridges over the River Colne (asset reference CVA002) all Grade II listed buildings of moderate heritage value. Denham Conservation Area (asset reference CVA013) is approximately 550m to the west of the land required for the re-aligned construction access. It is an asset of high heritage value, as reported in the main ES.

- 5.3.8 The land required for the amendment is within an area where there is a high potential for archaeological remains in undeveloped areas. This is indicated in the wider area by Neolithic and Bronze Age finds from near the M25 at Mopes and Warren Farms (asset reference CVA078) and the Iron Age and Romano-British agricultural settlement identified at Denham Park Farm and the Chenies (asset reference CVA076).

#### *Effects arising during construction*

- 5.3.9 The land required for the realigned construction access does not include any heritage assets or their setting.
- 5.3.10 The additional land required for the realignment of a construction access at Buckinghamshire Golf Club will not give rise to a new or different significant effect on cultural heritage during construction and will not change the level of significance of the effects reported in the main ES and in the AP1 ES.

#### *Effects arising from operation*

- 5.3.11 The additional land required for the realignment of a construction access at Buckinghamshire Golf Club will not give rise to a new or different significant effect on cultural heritage during operation and will not change the level of significance of the effects reported in the main ES and in the AP1 ES.

#### *Mitigation and residual effects*

- 5.3.12 There will be no change to the mitigation and residual effects reported in Volume 2 of the main ES, Volume 2, CFA 7, Section 6.

#### *Cumulative effects*

- 5.3.13 There are no new or different likely significant cumulative effects for cultural heritage as a result of the amendment acting in combination with another amendment in AP2, or in AP1, or as a result of any relevant committed development interacting with the AP2 revised scheme.

### **Ecology**

#### *Scope, assumptions and limitations*

- 5.3.14 The assessment scope for ecology is as set out in Volume 1 of the SES and AP2 ES. The key assumptions and limitations, and the methodology for determining significance of effects are as set out in Volume 1, the SMR (Volume 5: Appendix CT-001-000/1) and the SMR Addendum (Volume 5: Appendix CT-001-000/2) of the main ES.
- 5.3.15 To address any limitations in data, a precautionary baseline has been considered according to the guidance reported in the main ES, Volume 5: Appendix CT-001-000/2. This constitutes a 'reasonable worst-case' basis for the subsequent assessment. The precautionary approach to the assessment that has been adopted identifies the likely significant ecological effects of the AP2 revised scheme.

#### *Existing baseline*

- 5.3.16 The ecological baseline has been based on field data collated for the main ES for the land required for the amendment and adjacent land, aerial photography and existing



information gathered from national organisations and from regional and local sources including: Buckinghamshire and Milton Keynes Environmental Records Centre; Herts and Middlesex Wildlife Trust; Hertfordshire Biological Records Centre; Greenspace Information for Great London; Hertfordshire Bird Club; and the London, Essex and Hertfordshire Amphibian and Reptile Trust.

- 5.3.17 A summary of the baseline information relevant to the assessment of the amendment is provided below. This takes account of any relevant new or updated baseline information provided in SES and AP2 ES, Volume 5, Appendix EC-001-002. For those receptors described in the main ES, further details are provided in Volume 2, CFA7, Section 7.3 and in Volume 5, including maps EC-01 to EC-12.

### **Designated sites**

- 5.3.18 Denham Lock Wood SSSI is designated for diverse wet woodland and swamp habitat. Fray's Farm Meadows SSSI is designated for species-rich grassland, wetland plants and invertebrates. Denham Lock Wood SSSI is approximately 250m from the land required for the amendment. Fray's Farm Meadows SSSI is approximately 530m from the land required for the amendment. The main ES reports both SSSIs as being of national value.
- 5.3.19 The Mid-Colne Valley SMI and the River Colne east of Denham Biological Notification Site (BNS) are both partially within the land required for the amendment. Both are reported in the main ES as being of county/metropolitan value. The Mid-Colne Valley SMI is designated for riparian habitat with a diverse assemblage of aquatic and wetland plants, species-rich grassland and wet woodland. It is also designated for breeding and wintering water birds, invertebrates, water vole and harvest mouse. The River Colne east of Denham BNS is designated for river habitat including aquatic plants and fauna and is directly adjacent to the Mid-Colne Valley SMI.
- 5.3.20 Three LNR are relevant to the assessment of this amendment. Each is of district/borough value, as reported in the main ES. Denham Quarry Park LNR and Denham Country Park LNR are both partially within the land required for the amendment. Denham Quarry Park LNR is designed for wetland birds, invertebrates and grassland habitat and Denham Country Park LNR is designated for woodland, grassland, scrub and wetland habitats. Frays Valley LNR is 50m east of the land required at its closest point and is designated for woodland, grassland, scrub and wetland habitats.

### **Habitats**

- 5.3.21 The land required for the amendment is within Buckinghamshire Golf Course and includes a section of the River Colne and several of its small tributaries. As stated in the main ES, the River Colne qualifies as a habitat of principal importance and is of county/metropolitan value.
- 5.3.22 The banks of the River Colne comprise wet alder woodland, which is reported in the main ES as a habitat of principal importance and is of county/metropolitan value. The main ES also reports that the other woodland that is relevant to this amendment, St John's Covert, which is also within the Mid-Colne Valley SMI, is of county/metropolitan value.

5.3.23 The main ES reports that grassland within the Mid-Colne Valley SMI and the Denham Country Park LNR is of district/borough value. Much of the grassland that is within the land required for the amendment is within the SMI and LNR. Therefore, and as part of the precautionary assessment that was adopted for this habitat in the main ES, it is assumed the grassland relevant to the amendment is species-rich and thus a habitat of principal importance. As reported in the main ES, this habitat is therefore considered as being of up to district/borough value.

5.3.24 Much of the grassland surrounding the land required for the amendment comprises amenity grassland that is well managed as part of the Golf Course. This is of local/parish value, as reported in the main ES.

### **Protected and/or notable species**

5.3.25 The assemblage of 12 species of bat, identified in the main ES as being associated with woodland, river and standing water habitat within and adjacent to the Mid-Colne Valley SSSI, is relevant to this assessment. It comprises Daubenton's bat, Leisler's, serotine, brown long-eared bat, whiskered bat, unidentified whiskered/Brandt's bat, Natterer's bat, common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, Barbastelle bat and noctule. Due to the presence of suitable habitat it is likely that the bat assemblage will utilise the mature woodland, edge habitat and watercourses within land required for the amendment. The main ES reports that this bat assemblage is of up to regional value.

5.3.26 The assemblage of breeding birds associated with habitats in the Mid-Colne Valley SMI is relevant to this assessment. The assemblage has high species diversity and several species are present in numbers above 1% of the county population, including gadwall, kingfisher and Cetti's warbler and as such, is of county/metropolitan value.

5.3.27 The otter population along the River Colne, surrounding lakes and the Grand Union Canal is reported in the main ES to be up to county/metropolitan value. Despite the good connectivity to the wider landscape including the surrounding lakes and canal, the habitat within the land required for the amendment does not support a breeding otter holt. However, due to the land's likely use by foraging and commuting otters it is of district/borough value.

5.3.28 The potential water vole population associated within Savay Lake, Harefield No. 2 Lake, Denham Quarry Lake or the River Colne is reported in the main ES to be up to county/metropolitan value. Due to the presence of suitable habitat it is likely that water voles will utilise the watercourses within the land required for the amendment.

5.3.29 The main ES reports that the grassland and ditches associated with the Buckinghamshire Golf Course may support a population of great crested newt. As part of the precautionary assessment, the main ES assumed that the area supports a breeding metapopulation, which is of up to county/metropolitan value.

5.3.30 The main ES reports that the grassland and scrub in the Mid-Colne Valley SMI (between the River Colne and the Grand Union Canal) may support a population of reptiles. If the area supports a population of adder or a high number of grass snake or common lizard, the area would be of up to county/metropolitan value, as reported in the main ES.

- 5.3.31 The main ES also reports that the Colne River supports a fish assemblage of local/parish value and the surrounding grassland, woodland and scrub is of local/parish value for badger.

### *Future baseline*

#### **Construction (2017)**

- 5.3.32 Volume 5, Appendix CT-004-000 of the SES and AP2 ES provides details of the developments that are assumed to have been implemented by 2017, additional to those identified in the main ES.
- 5.3.33 None of the identified developments affect the assessment of the AP2 revised scheme's likely construction impacts on ecology.

#### **Operation (2026)**

- 5.3.34 Volume 5: Appendix CT-004-000 of the SES and AP2 ES provides details of the developments that are assumed to have been implemented by 2026, additional to those identified in the main ES.
- 5.3.35 None of the identified developments affect the assessment of the AP2 revised scheme's likely operational impacts on ecology.

### *Effects arising during construction*

#### **Avoidance and mitigation measures**

- 5.3.36 The assessment assumes implementation of the measures set out within the draft CoCP (Volume 5: Appendix CT-003-000 of the main ES), which includes translocation of protected species where appropriate.

#### **Designated sites**

- 5.3.37 The main ES reports that approximately 25ha of the Mid-Colne Valley SMI is within the land required for construction. This comprises approximately 18ha of broadleaved woodland, approximately 5ha of grassland and scrub and 2ha of wetland. In total approximately 4ha will be permanently lost. The combined loss of habitat and the resultant disturbance on the breeding bird assemblage will result in a permanent adverse effect on the integrity of the Mid-Colne Valley SMI that will be significant at the county/metropolitan level. The realignment of the access road will result in the additional loss of approximately 0.5ha of woodland and grassland. The amendment will therefore result in a different significant effect on the Mid-Colne Valley SMI. However, this change will not change the level of significance of the effects reported in the main ES and the AP1 ES.
- 5.3.38 As stated in the main ES, approximately 0.9ha (19%) of the River Colne east of Denham BNS is within land required to realign sections of the overhead power lines as part of the original scheme. As reported in the main ES, this will result in a permanent adverse effect on the integrity of the site that is significant at the county/metropolitan level. An additional 0.13ha of the BNS is within the land required for the amendment. It will therefore give rise to a different significant effect on the River Colne east of Denham BNS. However, this will not change the level of the significance of the effects reported in the main ES and the AP1 ES.

- 5.3.39 The main ES states that the Denham Quarry Park LNR (29ha) is partly within land required for construction of the original scheme but that no significant effects are expected as the extent of habitat affected is a small proportion of the site's area. The realignment of the access road will result in the additional loss of approximately 0.3ha of woodland. The site is designated for its value for grassland and wetland birds. Therefore, the loss of woodland will not affect the features for which this site is designated, and will not result in a significant effect on the site's integrity. The amendment will not give rise to new or different significant effects on this designated site and will not change the level of significance of the effects reported in the main ES and the AP1 ES.
- 5.3.40 The main ES states that approximately 10ha (52%) of the Denham Country Park LNR is within land required for construction of the original scheme. This extent of habitat loss will result in a permanent adverse effect on site integrity that is significant at the district/borough level, as stated in the main ES. An additional 500m<sup>2</sup> of woodland from the LNR is within the land required for the amendment. The amendment will therefore result in a different significant effect on Denham Country Park LNR. However, this will not change the level of the significance of the effects reported in the main ES and the AP1 ES.
- 5.3.41 It is unlikely that the amendment will result in any other new or different significant effects on other designated sites, beyond those reported in the main ES.

### **Habitats**

- 5.3.42 As reported in the main ES approximately 10ha of woodland, including wet alder woodland, will be lost from the Mid-Colne Valley SMI during the realignment of the overhead power lines. The extent of loss will result in an adverse significant impact on the conservation status of woodland from within the SMI at the country/metropolitan level. The amendment will require the removal of approximately 0.2ha of wet woodland from the banks of the River Colne. It will also require the removal of 0.3ha and 0.2ha of broadleaved woodland from Denham Quarry Park LNR and St John's Covert, respectively. The amendment will therefore give rise to a different effect on woodland, including wet woodland. However, this will not change the level of the significance of the effects reported in the main ES and the AP1 ES.
- 5.3.43 The main ES reported that 5ha of grassland within the Mid-Colne Valley SMI lies within the land required for the realignment of the overhead power lines. Its assumed loss would result in a permanent adverse effect on the conservation status of the habitat that is significant at the district borough level. The access road realignment amendment will result in the additional loss of 0.3ha of likely species-rich grassland. The amendment will therefore result in a different significant effect on grassland. However, this will not change the level of the significance of the effects reported in the main ES and the AP1 ES.
- 5.3.44 The main ES states that the River Colne is unlikely to be subject to any significant effects. The amendment will require the temporary access road to bridge less than 0.1ha of the river, which will not change the assessment in the main ES and the AP1 ES. The amendment is therefore unlikely to affect the conservation status of the river, which after construction will remain unaffected.

- 5.3.45 It is unlikely that any other effects on habitat receptors significant at more than the local/parish level will occur.

### **Protected and/or notable species**

- 5.3.46 The temporary access road will cross the River Colne, which is suitable to support water voles. As stated in the main ES, it is assumed that loss of suitable habitat could result in a permanent adverse effect on the conservation status that is significant at up to the county/metropolitan level. The amendment will result in the additional loss and disturbance of approximately 100m of riparian habitat along the banks of the river. With this small increase in habitat loss the amendment will give rise to a different significant effect on the assumed population of water voles. However, this change will not change the level of significance of the effects reported in the main ES and the AP1 ES.
- 5.3.47 The main ES identifies that the original scheme could result in a permanent adverse effect on the conservation status of great crested newt (if present) in the vicinity of Buckinghamshire Golf Course that would be significant at up to the county/metropolitan level. The amendment will not affect any breeding ponds but will result in the removal of an additional 0.3ha of grassland and 0.4ha of woodland. It will therefore result in a different significant effect on the conservation status of great crested newt. However, this will not change the level of significance of the effects reported in the main ES and the AP1 ES.
- 5.3.48 It is unlikely that the amendment will result in any other new or different effects on species receptors of relevance at more than the local/parish level.

### **Cumulative effects**

- 5.3.49 This amendment will require removal of 0.5ha of habitat from the Mid-Colne Valley SMI and a further 500m<sup>2</sup> will be removed for the revised alignment of the diverted 275kV overhead cables (refer to AP2-007-002). Due to the large extent of this site and the small area of loss from both amendments (approximately 0.2% of the site's area) no significant cumulative effects are likely.

### **Mitigation and residual effects**

#### *Other mitigation measures*

- 5.3.50 Large areas of compensatory woodland and grassland are provided in CFA 7 as part of the original scheme. The habitats within the land required for the amendment will also be reinstated post-construction. No additional mitigation measures (i.e. in addition to those identified in the main ES) are required.

#### *Summary of likely residual effects*

- 5.3.51 With the implementation of the mitigation measures proposed in the main ES the different ecological effects arising from the additional land required for the realignment of the construction access at Buckinghamshire Golf Club will be reduced to a level where they are not significant. The significant effects of the AP2 revised scheme in this area are therefore unchanged from those reported in the main ES and the AP1 ES.

*Effects arising from operation*

5.3.52 The additional land required for the realignment of a construction access at Buckinghamshire Golf Club will not give rise to a new or different significant effect and will not change the level of significance of the effects reported in the main ES and the AP1 ES.

**Water resources and flood risk assessment**

*Scope, assumptions and limitations*

5.3.53 The assessment scope, key assumptions and limitations for the water resources and flood risk assessment are as set out Volume 1, the SMR (Volume 5: Appendix CT-001 - 000/1) and the SMR Addendum (Volume 5: Appendix CT-001-000/2) of the main ES.

5.3.54 The new bridge will be a temporary structure. It will not require significant below ground works. Therefore, this amendment will not give rise to new or different significant effects on groundwater bodies during construction or operation. As such these receptors have not been assessed, except with regards to groundwater flooding.

*Existing baseline*

5.3.55 A summary of the baseline information relevant to the assessment of the amendment is provided below. For those receptors described in the main ES, further details are provided in the main ES, Volume 2, CFA7, Section 13.3 and in Volume 5.

5.3.56 Table 5 includes the surface water features potentially affected by the AP2 revised scheme.

Table 5: Surface water features potentially affected by the AP2 revised scheme

Water feature	Location description (Volume 5, Water Resources and Flood Risk Assessment)	Watercourse classification	WFD water body (water body number and current overall status)	WFD status objective (by 2027 as in River Basin Management Plan (RBMP))	Receptor value
Grand Union Canal	Eastern extent of the amendment area	Artificial	Grand Union Canal, Maple Lodge to Uxbridge (Rivers Colne and Chess plus canal sections)  WFD water body reference: GB70610252  Moderate	Good potential (by 2015)	Very High
River Colne	Follows eastern edge of Troy Lake	Main river	Colne and Grand Union Canal (from confluence with Chess to Ash)  WFD water body reference: GB106039023090	Good Potential	Very High

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Water feature	Location description (Volume 5, Water Resources and Flood Risk Assessment)	Watercourse classification	WFD water body (water body number and current overall status)	WFD status objective (by 2027 as in River Basin Management Plan (RBMP))	Receptor value
			Poor		
River Colne secondary and bypass channels	Between Grand Union Canal and River Colne, and to the rear of Buckinghamshire Golf Club Club House	Ordinary watercourse	No status class in RBMP – assumed status  Poor	Good Potential	Moderate
River Misbourne secondary channel	Bypass channel of River Misbourne leaves main channel at Court Farm and joins River Colne opposite St John's Covert  (SWC-CFA7-P17)	Ordinary watercourse	No status class in RBMP – assumed status  Poor Potential	Good Potential	Moderate
Three unnamed lakes	(SWC-CFA7-P01)	Lake	Not applicable	Not applicable	Moderate

- 5.3.57 The amendment includes a temporary access road which crosses the River Colne channel and Flood Zone 3 of the River Colne, and lies almost entirely within Flood Zone 2 of the combined River Colne and River Misbourne floodplains.
- 5.3.58 Receptors that have the potential to be affected by the AP2 revised scheme include commercial/leisure property (Moderate value receptors) including Buckinghamshire Golf Club, Colne Valley Park Visitors Centre and other commercial property on Denham Court Drive and residential properties (High value receptors) including The Cottage and The Gardens.
- 5.3.59 The London Borough of Hillingdon (LBH) Strategic Flood Risk Assessment<sup>6</sup> (SFRA) identifies a potential flood risk from overtopping of the Grand Union Canal during flood conditions within the River Colne. However, floodplain mapping suggests that the land adjacent to the Grand Union Canal does not become inundated until the 1 in 1,000 years return period (0.1% annual probability) flood event and it is not included in the Environment Agency hydraulic model of the River Colne.
- 5.3.60 The gravel pit lakes situated along the Colne Valley are all at or below existing ground levels and consequently there is no existing risk of flooding associated with them, except in combination with flooding from the River Colne.
- 5.3.61 The Buckinghamshire Preliminary Flood Risk Assessment (PFRA) shows that there are areas that have a susceptibility to groundwater flooding from superficial deposits. Further, the area is shown to lie within the 'Groundwater Emergence Map', which

<sup>6</sup> London Borough of Hillingdon (2008) London Borough of Hillingdon Strategic Flood Risk Assessment.

identifies areas where groundwater could rise to the surface following prolonged above average rainfall.

- 5.3.62 The LBH PFRA confirms that there is an increased potential for elevated groundwater along the valley of the River Colne within the LBH area.
- 5.3.63 Aside from the direct risk of flooding from the River Colne and River Misbourne, the amendment does not lie within an area at risk of surface water flooding. There is no significant risk of flooding in the area of the amendment from sewers. These flood sources are therefore not considered further in respect of this amendment.

### *Future baseline*

#### **Construction (2017)**

- 5.3.64 Volume 5, Appendix CT-004-000 of the SES and AP2 ES provides details of the developments that are assumed to have been implemented by 2017, additional to those identified in the main ES.
- 5.3.65 None of the identified developments affect the assessment of the AP2 revised scheme's likely construction impacts on water resources and flood risk.

#### **Operation (2026)**

- 5.3.66 Volume 5: Appendix CT-004-000 of the SES and AP2 ES provides details of the developments that are assumed to have been implemented by 2026, additional to those identified in the main ES.
- 5.3.67 None of the identified developments affect the assessment of the AP2 revised scheme's likely operational impacts on water resources and flood risk.

### *Effects arising during construction*

- 5.3.68 The temporary river crossing included as part of the amendment will be constructed in accordance with the draft CoCP. Implementation of sustainable drainage systems (SuDS) measures will ensure that run-off from impervious surfaces associated with the AP2 revised scheme will not have an adverse effect on surface water quality. The effect is considered neutral and will not change the level of significance of the effects reported in the main ES and the AP1 ES.
- 5.3.69 The design of the access road and temporary bridges over the River Colne and River Misbourne will be discussed with the Environment Agency prior to the start of construction. As a result of mitigation measures required by the CoCP, including allowing sufficient conveyance of flood flows under the temporary structures as well as preparation of site-specific flood risk management plans, there will be no significant increase in flood risk from all sources during construction or reinstatement of land following removal of the temporary road.
- 5.3.70 Rerouting the construction access at Buckinghamshire Golf Club will not give rise to a new or different significant effect on water resources or flood risk during construction and will not change the level of significance of the effects reported in the main ES and the AP1 ES.



### *Effects arising from operation*

- 5.3.71 The amendment will not give rise to a new or different significant effect on water resources or flood risk during operation and will not change the level of significance of the effects reported in the main ES and the AP1 ES.

### *Mitigation and residual effects*

- 5.3.72 The draft CoCP sets out the measures and standards of work that will be applied to the construction of the AP2 revised scheme (see the main ES, Volume 5, Appendix CT-003-000). These will provide effective management and control of the impacts during the construction period.
- 5.3.73 Appropriate mitigation will be provided to address the risks to the receiving water body, to both flow and water quality, from the temporary access. The mitigation will be selected during the detailed design of the AP2 revised scheme using Construction Industry Research and Information Association (CIRIA) guidance<sup>7</sup> to control the run-off rates and water quality in accordance with the necessary approvals.
- 5.3.74 Drainage will discharge, where reasonably practicable, to SuDS balancing ponds, prior to subsequent discharge to watercourses or if necessary to the sewer. All discharges to watercourses will be in accordance with consent conditions, as appropriate.
- 5.3.75 Any temporary culverts for watercourses will be designed to convey the 1 in 100 years return period (1% annual probability) flood flows, including an allowance for climate change, to ensure continued conveyance (flow) and no increase in downstream flood risk.
- 5.3.76 Generic design measures will be implemented to avoid significant residual adverse effects on the quality and flow characteristics of surface water courses, groundwater bodies and flood risk. These are described in Volume 1, Section 9 of the main ES and in the draft operation and maintenance plan for water resources and flood risk included in Volume 5, Appendix WR-001-000 of the main ES and the AP1 ES.
- 5.3.77 Rerouting the construction access at Buckinghamshire Golf Club will not give rise to a new or different residual significant effect and will not change the level of significance of the effects reported in the main ES.

### *Cumulative effects*

- 5.3.78 There are no new or different likely significant cumulative effects for water resources and flood risk as a result of the amendment acting in combination with another amendment in AP2, or in AP1, or as a result of any relevant committed development interacting with the AP2 revised scheme.

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<sup>7</sup> Murname, E., Heap, A. and Swain, A. (2006) C648 Control of Water Pollution from Linear Construction Sites, CIRIA, London, UK.

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

- 5.4.1 Rerouting the construction access at Buckinghamshire Golf Club does not change the level of significance of the environmental effects or proposed mitigation as set out in the main ES (Volume 2, CFA7) and the AP1 ES (Volume 2, CFA7).

## **5.5 Temporary closure of Bridleway Rickmansworth 004 (AP2-007-004)**

- 5.5.1 The Bill provides for the permanent provision of an overbridge up to approximately 1m above the existing ground level, providing a realignment of Tilehouse Lane and Bridleway Rickmansworth 004 over the HS2 route (refer to map CT-06-022 in main ES, Volume 2, CFA7 Map Book).
- 5.5.2 Since submission of the Bill, the need for powers for the temporary stopping up of Bridleway Rickmansworth 004 has been identified. The environmental impact of this has already been assessed and is reported in the main ES.
- 5.5.3 The temporary stopping up of the bridleway is not likely to make changes that require a reassessment of the effects or proposed mitigation as set out in the main ES with respect to any environmental topic.

## **6 Combined effects of amendments in this CFA due to changes in traffic flows**

- 6.1.1 All of the effects of the changes proposed in this CFA have been described above and there are no further combined effects to report.





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