

HIGH SPEED RAIL (LONDON - WEST MIDLANDS)

Supplementary Environmental Statement 3 and
Additional Provision 4 Environmental Statement
Volume 1 | Introduction and methodology

October 2015

SES3 and AP4 ES 3.1.1



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Department
for Transport

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A report prepared for High Speed Two (HS2) Limited:

AECOM

ARUP

ATKINS

CAPITA



ineco



**PARSONS
BRINCKERHOFF**



High Speed Two (HS2) Limited,
One Canada Square,
London
E14 5AB

Details of how to obtain further copies are available from HS2 Ltd.

Telephone: 020 7944 4908

General email enquiries: HS2enquiries@hs2.org.uk

Website: www.gov.uk/hs2

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Preface

This supplementary environmental information is being deposited as supplementary information under Private Business Standing Order 224A of the House of Commons and Standing Order 83A of the House of Lords (Comments on environmental statement).

Structure of the HS₂ Supplementary Environmental Statement 3 and Additional Provision 4 Environmental Statement

The Supplementary Environmental Statement 3 (SES₃) and Additional Provision 4 Environmental Statement (AP₄ ES) comprises:

- Non-technical summary (NTS). This provides a summary in non-technical language of the SES₃ (Part 1) and AP₄ 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 2 (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') as updated by subsequent SES and AP ES documents.
- Volume 1: Introduction to the SES₃ and AP₄ ES. This introduces the supplementary environmental information and design changes included within the SES₃ and amendments, which have resulted in the need to amend the Bill, within the AP₄ ES. It also explains any changes to the scope, methodology, assumptions and limitations required for the environmental assessment.
- Volume 2: Community Forum Area (CFA) reports and Map Books. These describe the supplementary environmental information and design changes included within the SES₃ (Part 1) and amendments within the AP₄ ES (Part 2). Any new or different likely significant environmental effects arising from these changes and amendments in each CFA, compared to those reported in the main ES, as updated by SES and SES₂ documents (and SES₃ for the AP₄ amendments) are reported. The AP₁, AP₂ and AP₃ amendments are also taken into account where relevant. In addition, 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 SES₃ (Part 1) and amendments within the AP₄ ES (Part 2) compared to those reported in the main ES as updated by SES and SES₂ (and SES₃ for the AP₄ amendments). The AP₁, AP₂ and AP₃ amendments are also taken into account where relevant.
- Volume 4: Off-route effects. This reports new or different likely significant off-route effects arising from the supplementary environmental information and design changes included within the SES₃ and amendments within the AP₄ ES compared to those reported in the main ES as updated by SES and SES₂ (and SES₃ for the AP₄ amendments). The AP₁, AP₂ and AP₃ amendments are also

taken into account where relevant.

- Volume 5: Appendices and Map Books. This contains environmental information and associated maps in support of the other volumes of the SES₃ and AP₄ ES.
- Glossary of terms and list of abbreviations. This contains any new or different terms and abbreviations used throughout the SES and AP ES reports, additional to those included in the main ES.

1 Introduction

1.1 Background to High Speed Two

1.1.1 The hybrid Bill for high speed rail between London and the West Midlands ('the Bill') was submitted to Parliament together with an Environmental Statement (ES) in November 2013 ('the main ES'). If enacted by Parliament, the Bill will provide the powers to construct, operate and maintain Phase One of High Speed Two (HS₂). This phase of HS₂ will provide a new north-south railway between London, Birmingham and the West Midlands. Phase Two of HS₂ will comprise new lines between the West Midlands, Leeds and Manchester, completing what is known as the 'Y network'. Phase Two is not the subject of this document.

1.1.2 Since the deposit of the Bill, the need for a number of amendments (i.e. changes that require amendments to the Bill) to the scheme have been identified. These have been promoted in Parliament through the following three Additional Provisions (APs), which were each accompanied by an ES:

- AP₁: deposited in Parliament in September 2014. This focused on community forum areas (CFAs) 7 (Colne Valley) to 26 (Washwood Heath to Curzon Street);
- AP₂: deposited in Parliament in July 2015. This focused on CFAs 4 (Kilburn (Brent) to Old Oak Common) to 26 (Washwood Heath to Curzon Street); and
- AP₃: deposited in Parliament in September 2015. This focused on CFAs 1 (Euston station and approach) to 3 (Primrose Hill to Kilburn (Camden)).

Any new or different significant effects that were likely to result from changes to the design which do not require amendments to the Bill, changes to construction assumptions, new environmental baseline information and corrections to the main ES were reported in the following Supplementary Environmental Statements (SESs):

- the SES₁: submitted alongside the AP₂ ES. This focused on CFAs 4 (Kilburn (Brent) to Old Oak Common) to 26 (Washwood Heath to Curzon Street); and
- the SES₂: submitted alongside the AP₃ ES. This focused on CFAs 1 (Euston station and approach) to 5 (Northolt Corridor).

1.1.3 Since submission of the SES₂ and AP₃ ES, the need for a number of further amendments has been identified in CFAs 4 (Kilburn (Brent) to Old Oak Common) to 26 (Washwood Heath to Curzon Street). These include a 2.6km extension northwards of the Chiltern tunnel in CFA₉ (Central Chilterns) and additional land for ecological mitigation at Langley (a location away from the route of the scheme). These amendments are being promoted via AP₄. The associated AP₄ ES describes these amendments and reports the associated likely significant environmental effects.

1.1.4 In addition to these amendments, there are also a number of design changes in CFAs 4 (Kilburn (Brent) to Old Oak Common) to 26 (Washwood Heath to Curzon Street) that do not require amendments to the Bill. Environmental information not previously available for the assessment has also become available (including changes to construction assumptions) and the need for a number of corrections to the main ES

and subsequent SESs and AP ESs has been identified. Any new or different significant effects that are likely to result from these changes are reported in a third SES ('SES₃').

1.1.5 These additional amendments and design changes have arisen through the High Speed Rail (London – West Midlands) Select Committee ('the Select Committee') process, on-going discussions with petitioners and key stakeholders, and as a result of design refinements.

1.1.6 Table 1 lists each of the CFAs, illustrating which have amendments and SES changes.

Table 1: Table illustrating which CFAs have amendments and SES changes

CFA	AP ₁	SES	AP ₂	SES ₂	AP ₃	SES ₃	AP ₄
1				●	●		
2				●	●		
3				●	●		
4		●	●	●		●	●
5		●	●	●			●
6		●	●			●	●
7	●	●	●			●	●
8		●				●	●
9	●	●	●			●	●
10	●	●	●			●	●
11	●	●	●			●	●
12	●	●	●			●	●
13	●	●	●			●	●
14	●	●	●			●	
15	●	●	●			●	●
16	●	●	●			●	●
17	●	●	●			●	●
18	●	●	●			●	●
19	●	●	●			●	●
20	●	●	●			●	●
21	●	●	●				
22	●	●	●			●	●
23		●	●			●	●
24	●	●	●			●	●
25		●	●			●	●
26	●	●	●			●	●

1.1.7 A formal consultation will be undertaken on the SES₃ and the AP₄ ES. There will also be a petitioning period for those directly and specially affected by the changes. Any petitions against these changes will be heard by the Select Committee in due course.

1.2 Terminology used to describe the scheme

1.2.1 In order to differentiate between the original scheme assessed as part of the main ES and subsequent changes, the following terms in Table 2 are used throughout the SES₃ and the AP₄ ES.

Table 2: Scheme descriptions

Scheme name	Definition	Relevant CFAs
the original scheme	the Bill scheme submitted to Parliament in November 2013, which was assessed in the main ES	1 to 26
the AP ₁ revised scheme	the original scheme as amended by the AP submitted in September 2014	7 to 26
the SES scheme	the original scheme with the design changes described in the SES submitted in July 2015	4 to 26
the AP ₂ revised scheme	the SES scheme as amended by the AP ₂ submitted in July 2015	4 to 26
the SES ₂ scheme	the original scheme as updated by the SES scheme, with the design changes described in the SES ₂ submitted in September 2015	1 to 5 (i.e. this applies in the London area only)
the AP ₃ revised scheme	the SES ₂ scheme as amended by the AP ₃ submitted in September 2015	1 to 5 (i.e. this applies in the London area only)
the SES ₃ scheme	the SES ₂ scheme with the design changes described in the SES ₃ submitted in October 2015	4 to 26
the AP ₄ revised scheme	the SES ₃ scheme as amended by the AP ₄ submitted in October 2015	4 to 26

1.2.2 The following terms are also used to differentiate between design changes included in the SES₃ and those included in the AP₄ ES:

- 'SES₃ design changes' – changes to the scheme reported in the SES₃ that do not require amendments to the Bill; and
- 'AP₄ amendments' – changes to the scheme reported in the AP₄ ES that require amendments to the Bill.

1.3 The SES₃ and the AP₄ ES

1.3.1 The SES₃ and the AP₄ ES are separate ESs, but have been produced as combined volumes (see section 1.4 of this report for further details).

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1.3.2 The SES₃ presents an assessment of the new or different likely significant effects arising from the SES₃ changes compared to the most recent SES scheme which forms the baseline for the assessment. In some cases, SES₃ changes are also included where

they do not result in new or different likely significant environmental effects (this is discussed in paragraph 1.3.4 of this report), in order to adequately describe the scheme.

1.3.3 The SES₃ reports any new or different likely significant environmental effects resulting from:

- updated/new environmental baseline information;
 - ecology; additional surveys including habitat surveys and surveys for protected species;
 - traffic and transport: additional traffic surveys; and
 - water resources and flood risk assessment; reassessment of the impact the construction of the scheme will have on water resources as a result of Environment Agency updates to source protection zones for a number of public water supply abstractions; and
- design changes that can be made without further amendments to the Bill, including changes to:
 - permanent scheme infrastructure: including extension to the porous section of the West Ruislip portal of the Northolt tunnel in CFA6 (South Ruislip to Ickenham); extension of the southern porous portal of the Burton Green tunnel in CFA18 (Stoneleigh, Kenilworth and Burton Green); and the provision of a maintenance base near Old Oak Common station in CFA₄ (Kilburn (Brent) to Old Oak Common);
 - utilities: changes to, and additional realignments and diversions of overhead and underground power lines, and removal of proposed utility works. For example, the main ES reported that an existing gas main would be replaced in CFA₂₅ (Castle Bromwich and Bromford), however, this is no longer required;
 - roads and public rights of way (PRoW): changes to temporary diversions of PRoW and temporary junction improvements . For example, an alternative diversion route will be provided for Footpath U₄₉ in CFA6 (South Ruislip to Ickenham) from that proposed as part of the original scheme;
 - mitigation: including the provision of additional mitigation, reconfiguration, reduction and the relocation of areas of proposed mitigation. For example, provision of an area of landscape mitigation planting at Stoke Mandeville in CFA₁₁ (Stoke Mandeville and Aylesbury); and
 - existing businesses: the Bickenhill Waste Recycling Centre will be relocated to near the A₄₅ Coventry Road in CFA₂₄ (Birmingham Interchange and Chelmsley Wood); and
- changes to construction assumptions from those in the main ES, and the subsequent SESs and AP ESs, where relevant:
 - revised construction assumptions relating to the use of the M₂₅ slip roads for heavy goods vehicles to access construction compounds within CFA₇;
 - revised construction assumptions for construction traffic movements in CFA₁₈

(Stoneleigh, Kenilworth and Burton Green) and associated slip road onto the A46; and

- updated construction methodology for the Curzon Street No.2 viaduct in CFA₂₆ (Washwood Heath to Curzon Street); and

- corrections to the main ES, the subsequent SESs and the AP ESs.

1.3.4 The SES₃ also reports the following, that may not result in any new or different likely significant environmental effects:

- design changes that do not require amendments to the Bill, but are required to be reported in order to adequately describe the scheme, including:
 - provision of an HS₂ maintenance base near the interchange auto-transformer station in CFA₂₄ (Birmingham Interchange and Chelmsley Wood), adjacent to the proposed Birmingham Interchange station; and
 - provision of a training area and larger car park at Calvert infrastructure maintenance depot in CFA₁₃ (Calvert, Steeple Claydon, Twyford and Chetwode); and
- corrections to factual inaccuracies identified in the main ES, the SES and the AP₂ ES.

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1.3.5 The AP₄ ES reports any new or different likely significant environmental effects due to the amendments proposed in AP₄ compared to the SES₃ scheme, which forms the new baseline. Where relevant the assessment also reports the likely significant cumulative effects taking into account previous AP amendments.

1.3.6 In some instances, an AP₄ amendment is reliant on land required for previous AP schemes. Where this occurs it is assumed that the relevant previous AP amendment will be enacted, and therefore the total impact of the AP₄ amendment with the relevant previous AP amendment is assessed. The AP₄ ES reports whether any resulting significant environmental effects are new or different compared to those reported in the relevant previous AP.

1.3.7 The AP₄ amendments include:

- permanent scheme infrastructure including: a 2.6km extension of the Chiltern Tunnel in CFA₉ (Central Chilterns), relocation of the proposed Salisbury Road ventilation shaft from the area proposed in the original scheme to Canterbury Works in CFA₄ (Kilburn (Brent) to Old Oak Common), and relocating the proposed Oxford Canal viaduct in CFA₁₆ (Ladbroke and Southam) approximately 20m further north than proposed as part of the original scheme. Other changes to scheme infrastructure include the provision of additional track drainage, provision of additional balancing ponds and modification and reconfiguration of balancing ponds proposed as part of the original scheme;
- utilities: amendments to the amount of land required temporarily for works to pylons, overhead power lines and a sewer diversion. For example, additional land for the permanent diversion of an overhead power line which runs

through the Network Park Industrial Estate in CFA26 (Washwood Heath to Curzon Street), to allow it to be permanently diverted underground;

- construction compounds: relocation of the Nash Lee Road satellite compound proposed as part of the original scheme to an agricultural field west of the Wendover north cutting and north of residential properties off the B4009 Nash Lee Road in CFA10 (Dunsmore, Wendover and Halton);
- community facilities and existing businesses: relocation of the Island Project School in CFA23 (Balsall Common and Hampton-in-Arden) to Jerrings Hall Farm; and the relocation of a bottom ash plant in CFA25 (Castle Bromwich and Bromford) to Tyseley;
- roads and PRoW: changes to the locations of temporary diversions or permanent realignments of roads and PRoW, provision of junction improvements and provision of roundabouts. For example, relocation of the proposed footpath overbridge SBH/32 in Lower Hartwell in CFA11 (Stoke Mandeville and Aylesbury) approximately 70m further north than proposed as part of the original scheme;
- access arrangements: changes to the locations, alignments or width of some access tracks proposed as part of the original scheme, and provision of additional access tracks from those proposed as part of the original scheme; additional access rights to allow vehicles to use a private road. For example, relocation of the secondary construction access route that was proposed as part of the original scheme in CFA16 (Ladbroke and Southam) to follow Ridgeway Lane near Ufton; and
- mitigation provision: including the provision of additional mitigation, reconfiguration, reduction and relocation of areas of proposed mitigation. For example, the provision of ecological mitigation in Langley (off-route).

1.4 Structure of the SES₃ and the AP₄ ES

1.4.1 The SES₃ and the AP₄ ES are separate documents. However, they are bound together and presented in a number of combined volumes. The SES₃ and the AP₄ ES comprise:

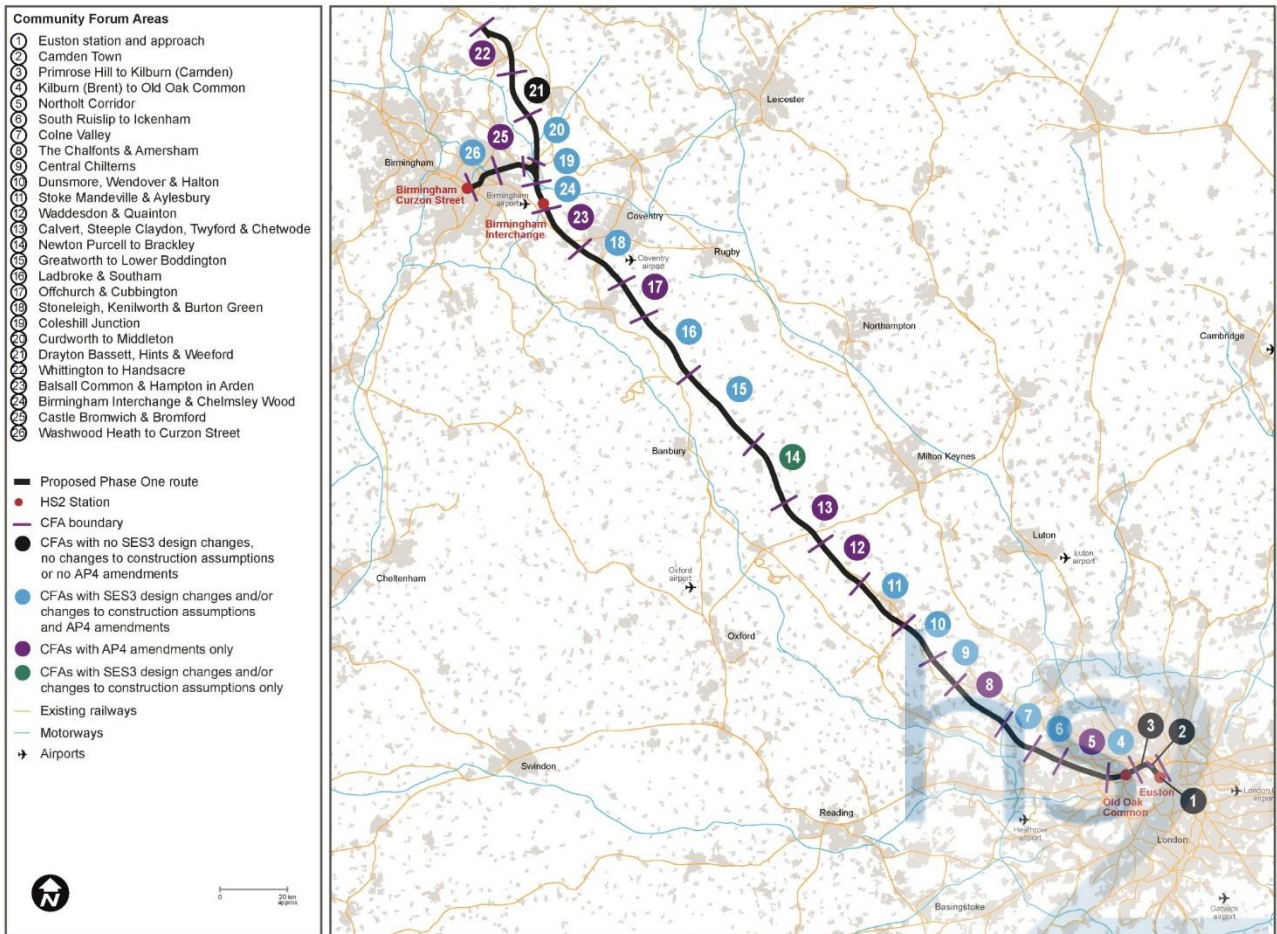
- Non-technical summary (NTS). This provides a summary in non-technical language of the SES₃ and AP₄ ES and of any likely significant environmental effects, both beneficial and adverse, which are new or different to those reported in the main ES as updated by subsequent SESs and AP ESs;
- Volume 1: introduction to the SES₃ and AP₄ ES. This introduces the supplementary environmental information and design changes included within the SES₃ and amendments, which have resulted in the need to amend the Bill, within the AP₄ ES. It also explains any changes to the scope, methodology, assumptions and limitations required for the environmental assessment;
- Volume 2: CFA reports and map books. These describe the supplementary environmental information and design changes included within the SES₃ and amendments within the AP₄ ES. Any new or different likely significant environmental effects arising from these changes and amendments in each

CFA, compared to those reported in the main ES, as updated by SES and SES₂ documents (and SES₃ for the AP₄ amendments) are reported. The AP₁, AP₂ and AP₃ amendments are also taken into account where relevant. In addition, 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 SES₃ and amendments within the AP₄ ES compared to those reported in the main ES as updated by SES and SES₂ (and SES₃ for the AP₄ amendments). The AP₁, AP₂ and AP₃ amendments are also taken into account where relevant;
- Volume 4: off-route effects. This reports new or different likely significant off-route effects arising from the supplementary environmental information included within the SES₃ and an amendment within the AP₄ ES compared to those reported in the main ES as updated by SES and SES₂ (and SES₃ for the AP₄ amendment). The AP₁, AP₂ and AP₃ amendments are also taken into account where relevant;
- Volume 5: appendices and map books. This contains environmental information and associated maps in support of the other volumes of the SES₃ and AP₄ ES; and
- glossary of terms and list of abbreviations. This contains any new or different terms and abbreviations used throughout the SES and AP ES reports, additional to those included in the main ES.

SES3 and AP4 ES Volume 1

Figure 1: Phase One route showing the community forum areas with and without AP4 amendments and SES3 design changes and changes to construction assumptions



1.5 Structure of this report

1.5.1 The remainder of this report is structured as follows:

- Section 2: Introduction to the SES₃ and the AP₄ ES;
- Section 3: Scope and methodology of the SES₃ and the AP₄ ES;
- Section 4: Approach to the appendices in the SES₃ and the AP₄ ES;
- Section 5: Approach to mapping in the SES₃ and the AP₄ ES;
- Section 6: Changes to the construction programme and construction assumptions;
- Section 7: Approach to mitigation associated with the SES₃ and the AP₄ ES; and
- Section 8: Consultation on the SES₃ and the AP₄ ES.

2 Introduction to the SES₃ and the AP₄ ES

2.1 Introduction to the SES₃

2.1.1 The SES₃ presents an assessment of any new or different likely significant environmental effects that result from the SES₃ changes. Where relevant, this includes:

- updated and new environmental baseline information (including additional ecology and traffic surveys);
- changes to the design and to construction assumptions of the scheme that do not require amendments to the Bill; and
- corrections to the main ES and the subsequent SESs and AP ESs.

Updated/new environmental baseline information

2.1.2 Environmental baseline surveys for the scheme have continued to be undertaken since the production of the main ES (September 2013). Despite the efforts of HS₂ Ltd to undertake comprehensive surveys on the land in advance of Bill deposit in 2013, access to some sites was denied or became available too late to be incorporated into the main ES. In such cases, a precautionary assessment was therefore undertaken for the main ES, based on environmental information gathered from desk-based research, information provided by third parties and professional judgement.

2.1.3 Since the production of the main ES, additional access has been granted and further surveys have been undertaken. New areas of land have also been identified and surveyed and additional desk-based baseline information has become available for some environmental topics. Within the SES₃ these surveys and additional desk-based information addresses the following environmental topics:

- ecology surveys: including habitats, amphibians, badger, bats, dormouse, otter, water vole, white clawed crayfish, reptiles, fish, wintering birds, breeding birds, pine marten and terrestrial invertebrates;
- additional traffic surveys: these have been undertaken in CFAs 7 (Colne Valley) to 15 (Greatworth to Lower Boddington) (excluding CFA₁₄ – Newton Purcell to Brackley), to supplement the information reported in the main ES; and
- water resources and flood risk assessment: since submission of the main ES, the Environment Agency has updated the source protection zones for a number of public water supply abstractions in CFAs 8 (The Chalfonts and Amersham) and 9 (Central Chilterns). This has been taken into account where relevant to the AP₄ scheme (i.e. where this would form the baseline for an AP₄ amendment).

2.1.4 Further information on updated/new environmental baseline information can be found within the SES₃ and the AP₄ ES, Volume 2 CFA reports.

2.1.5 The SES₃ reports new baseline information where it is relevant to the assessment of a new or different likely significant environmental effect or where it forms relevant baseline to the assessment of an SES₃ design change and AP₄ amendments.

Changes to the design and to construction assumptions that do not require amendments to the Bill

- 2.1.6 Some changes to the design of the scheme and changes to construction assumptions do not require amendments to the Bill. These are reported within the Volume 2 CFA reports in the SES₃, where they:
- result in new or different likely significant environmental effects from those reported in the main ES and, where relevant, the subsequent SESs and AP ESs; or
 - are required in order adequately to describe features of the scheme.

Corrections to the main ES and the subsequent SESs and AP ESs

- 2.1.7 Since the deposit of the main ES, the need for a small number of corrections has been identified. Those that were previously identified as having the potential to result in a new or different likely significant environmental effect were reported in the SES or the SES₂.
- 2.1.8 Since then, a number of further corrections to the main ES, the SES and the AP₂ ES have been identified. Each of these further corrections have been reviewed to determine whether they will potentially lead to new or different likely significant environmental effects from those described in the main ES, the SES and the AP₂ ES. Where they do these are reported in Part 1 of the relevant Volume 2 reports of the SES₃ and AP₄ ES. The SES₃ also reports corrections to factual inaccuracies identified in the main ES, the SES and the AP₂ ES that may not result in any new or different significant environmental effects.

2.2 Introduction to the AP₄ ES

- 2.2.1 The AP₄ amendments located within the CFAs are described in each Volume 2 CFA report. There is also an amendment located away from the HS₂ route (i.e. off-route), which is described in Part 2 of Volume 4 (Off-route effects report).
- 2.2.2 The assessment of AP₄ amendments takes account of the additional baseline information and those SES₃ design changes which may have an impact.
- 2.2.3 The AP₄ ES reports on the assessment of amendments taking account of the main ES, and the subsequent SESs and AP ESs that are relevant to that AP₄ amendment. Further information on which subsequent SESs and AP ESs are taken account of in each CFA report is outlined in Table 1 of this report.

3 Scope and methodology of the SES₃ and the AP₄ ES

3.1 Scope and methodology for the main ES and subsequent SESs and AP ESs

- 3.1.1 The HS₂ Scope and Methodology Report (SMR) (main ES, Volume 5: Appendix CT-001-000/1) was published in September 2012 and set out the proposed scope and methodology for the Environmental Impact Assessment (EIA) of the scheme.
- 3.1.2 A first SMR Addendum (main ES, Volume 5: Appendix CT-001-000/2) was published in November 2013 and outlined where the methodology presented within the SMR had been amended or advanced as a result of:
- changes to legislation or industry best practice guidance;
 - the methodology undergoing refinement as a result of its application within the EIA; and
 - further feedback on the outlined methodology received from stakeholders including statutory bodies following the publication and application of that methodology.
- 3.1.3 There were further updates to the scope and methodology which was used in the assessment presented in the AP₁ ES, the SES and AP₂ ES, and the SES₂ and AP₃ ES. These updates focused on the following environmental topics in each of the subsequent SESs and AP ESs:
- AP₁ ES: ecology, and landscape and visual assessment;
 - the SES and the AP₂ ES: ecology, landscape and visual assessment, and air quality. The updates to the methodology to air quality were set out in a second SMR Addendum (CT-001-00/3 of the SES and AP₂ ES); and
 - the SES₂ and the AP₃ ES: ecology, traffic and transport, and air quality. The updates to the methodology for air quality and traffic and transport were set out in a third addendum to the SMR (Appendix CT-001-000/4 of the SES₂ and the AP₃ ES). This air quality section replaces the previous air quality sections included in the SMR and the previous addendums.
- 3.1.4 These changes are described in more detail in Section 3.1 of Volume 1 of the AP₁ ES, Section 4.3 of Volume 1 of the SES and the AP₂ ES, and Section 3.4 of the SES₂ and AP₃ ES.

3.2 Scope and methodology for the SES₃ and the AP₄ ES

- 3.2.1 As with the approach taken for the previous ESs, prior to assessing the environmental effects of each SES₃ change and AP₄ amendment, a scoping exercise was undertaken based on a precautionary approach.

- 3.2.2 The scoping exercise was used to determine whether the SES₃ changes and the AP₄ amendments had the potential to result in any new or different likely significant environmental effects.
- 3.2.3 Any SES₃ changes and AP₄ amendments identified as having the potential to result in any new or different likely significant environmental effects were then subject to further assessment work, following the methodology outlined for each environmental topic in the SMR and the subsequent addendums and updates to methodology.
- 3.2.4 There have also been some further refinements to the scope and methodology for ecology, which have been applied within this SES₃ and the AP₄ ES. These are set out in the fourth addendum to the SMR (SES₃ and AP₄ ES Volume 5: Appendix CT-001-000/5) and are summarised below.

Ecology

- 3.2.5 The SES₃ and AP₄ ES assessments take into account all baseline collected up to the end of December 2014. This survey work was conducted in accordance with both the methods and survey extents set out within the Ecology Technical Note: Field Survey Methods and Standards (main ES, Volume 5: Appendix CT-001-000/1). In addition, in order to ensure that the SES₃ and AP₄ ES also considers the most up to date relevant baseline information, the interim results of ongoing 2015 survey work are considered where this information is relevant to a proposed SES₃ design change or AP₄ amendment.
- 3.2.6 HS₂ Ltd continues to make efforts to collect supplementary ecological baseline data. Survey work undertaken within CFAs 4 to 26 during 2015 has been conducted according to the technical methods set out in the Ecology Technical Note: Field Survey Methods and Standards, except for amphibians where an additional survey methodology has been introduced. Great crested newt surveys undertaken during 2015 have utilised eDNA survey for identifying presence or likely absence of great crested newt. eDNA survey is a recently developed technique and details of the methodology are provided in Addendum 4 to the SMR.
- 3.2.7 The survey extents in 2015 have been refined from those set out in the Ecology Technical Note: Field Survey Methods and Standards, and greater emphasis has been placed on targeting survey work at those locations where it is known, or it is likely, that adverse impacts arising from the construction and operation of the scheme will occur. Further details of the relevant default survey extents for work undertaken or proposed in CFAs 4 to 26, during 2015 are provided in Addendum 4 to the SMR.
- 3.2.8 Where appropriate, professional judgement has been applied to refine the default survey extents set out above based on local conditions and the potential impacts of the scheme.

General assumptions and limitations

- 3.2.9 During the preparation of an ES, there are sometimes circumstances in which the information available to inform the assessment process is limited. For example, there is inevitably some uncertainty in predicting future baseline conditions, impacts and effects, especially given that the scheme is not due to begin operating until 2026.

- 3.2.10 In addition, while it has been possible to access more land where permission had previously not been given, it has not been possible to carry out surveys on all the land affected. Nevertheless, it is considered that the baseline is sufficiently robust to allow the assessment of the likely significant environmental effects of the scheme on the basis of a precautionary approach.
- 3.2.11 Where relevant each environmental topic assessment explains the key assumptions made in undertaking the assessment, and their consequences on the completeness or potential accuracy of the conclusions have been identified. Section 8 in Volume 1 of the main ES provides a description of general assumptions and limitations for each environmental topic. Local assumptions and limitations are described within the SES₃ and the AP₄ ES Volume 2 CFA reports.
- 3.2.12 As with the SES and AP₂ ES, and the SES₂ and AP₃ ES, the results of the climate change risk assessment reported in the main ES are still considered valid for the AP₄ revised scheme. Climate risks on the SES₃ scheme and AP₄ revised scheme will be addressed through future design, during construction (through implementation of the draft CoCP), and in future operation and maintenance plans.

4 Approach to appendices in the SES₃ and the AP₄ ES

- 4.1.1 As with Volume 5 of the main ES, and the subsequent SESs and AP ESs (except the AP₁ ES, where supporting environmental information was included in the relevant Volume 2 CFA report), Volume 5 of the SES₃ and the AP₄ ES contains supporting environmental information in the form of appendices.
- 4.1.2 Generally, the SES₃ and the AP₄ ES appendices update the corresponding appendices within the main ES and should therefore be read in conjunction with them and, where relevant, the appendix updates in the subsequent SESs and AP ESs. The SES₃ and the AP₄ ES appendices do not repeat information contained within the relevant main ES appendix if that information does not require updating as a result of the changes within the SES₃ and the AP₄ ES (e.g. policy framework, information on methodologies etc.).
- 4.1.3 Where only minor updates are required to a Volume 5 appendix from the main ES, the SES₃ and the AP₄ ES appendix material is included within the relevant Volume 2, 3 or 4 reports.
- 4.1.4 Volume 5 of the SES₃ and AP₄ ES includes details of all amphibian surveys conducted during 2015 (Appendices EC-001-001, EC-001-002, EC-001-003, EC-001-004, EC-001-005 and HEX-EC-001 Volume 5 map series EC-04). Where other new ecology data collected in 2015 are relevant to the SES₃ or AP₄ assessments and generates a new or different significant effect, the relevant baseline data tables normally contained within Volume 5 are provided within the relevant Volume 2 CFA reports. The additional traffic and transport surveys are presented in Volume 5 Appendix TR-001-000 of this SES₃ and AP₄ ES.
- 4.1.5 Volume 5 also presents an update of the electromagnetic interference assessment (Appendix EM-001-000 of the main ES and the SES and AP₂ ES, and the SES₂ and AP₃ ES) and the Wider effects report (Appendix CT-005-000 of the main ES and the SES and AP₂ ES). These updates consider whether the conclusion of the corresponding main ES appendices, and subsequently updated appendices, change as a result of the SES₃ changes and the AP₄ amendments.

5 Approach to mapping in the SES₃ and the AP₄ ES

- 5.1.1 Construction (CT-05) and operation (CT-06) mapping has been produced to indicate the SES₃ design changes and the AP₄ amendments. In each case, the relevant map from the main ES has been reproduced showing the original scheme and a second map showing the SES₃ scheme and the AP₄ revised scheme. On these maps a colour coded 'cloud' system is used, where:
- a grey 'cloud' indicates the location of AP₁, AP₂ and AP₃ amendments, and SES and SES₂ design changes;
 - a blue 'cloud' indicates the location of SES₃ design changes; and
 - a red 'cloud' indicates the location of AP₄ amendments.
- 5.1.2 Other design changes which are within the existing powers of the Bill and do not result in new or different likely significant environmental effects are also shown on the maps, but are not indicated by a cloud. The CT-05 and CT-06 maps are included in the Volume 2 map book for each of the relevant CFAs.
- 5.1.3 The relevant environmental maps in the Volume 2 and 5 map books have been produced where a new or different likely significant environmental effect from those reported in the main ES, or where relevant, the subsequent SESs and AP ESs will occur. Maps have also been produced when features, resources, receptors, or viewpoints are added or removed from the main ES. On the maps, in general:
- red labels are used to show an increase in the magnitude of a likely significant environmental effect; and
 - green labels are used to show a reduction.
- 5.1.4 The descriptions on the labels indicate whether the change is from an SES₃ design change or an AP₄ amendment.
- 5.1.5 Ecology maps in Volume 5 containing new survey data have been updated. New survey data is highlighted and is limited to 2015 surveys related to amphibians.
- 5.1.6 Additional relevant new survey data that has become available for water resources and flood risk assessment since the submission of the main ES is also presented on the maps. The same approach from the main ES is followed, with new surveys highlighted on each relevant map sheet.
- 5.1.7 Maps have also been produced to highlight committed developments that have been identified since the submission of the main ES, or where relevant the subsequent SESs and AP ESs.

6 Changes to the construction programme and construction methods

- 6.1.1 The SES₃ and the AP₄ ES describe, in some CFAs, a number of changes in the construction programme (e.g. increased/decreased construction durations) from those reported within the main ES for the original scheme. In the case of most minor design changes, it is likely that they will not generate a change in the construction programme. The period and length of time that construction compounds will be required will be likely to change in accordance with the changes to the construction programme.
- 6.1.2 The assessment was based on the construction methodologies described in the main ES (e.g. approach to constructing stations, depots, cuttings, embankments, tunnels, viaducts and bridges), and updated in the AP₁ ES. Further detail on construction assumptions can be found within Section 6 of Volume 1 of the main ES and Section 2 of Volume 1 of the AP₁ ES. Any changes to construction methodology in the SES₃ and the AP₄ ES are outlined in the relevant Volume 2 CFA report.

7 Approach to mitigation associated with the SES₃ and the AP₄ ES

- 7.1.1 The 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 and subsequent SESs and AP ESs, and the draft Code of Construction Practice which sets out measures to manage and control the effects of construction. These were provided to Parliament at the same time the Bill was deposited in November 2013. The same approach to mitigation measures described in the main ES still applies. Site specific mitigation measures are described within volumes 2, 3 and 4 of the SES₃ and the AP₄ ES, where required.

8 Consultation on the SES₃ and the AP₄ ES

- 8.1.1 A formal public consultation on both the SES₃ and the AP₄ ES is required by Parliamentary Standing Orders. Consultees will have 42 days to respond to the consultation following the deposit of the SES₃ and the AP₄ ES in Parliament and the first publication of the necessary newspaper notices that follow. Parliamentary officials have appointed an independent assessor who will summarise consultation responses and provide a report to Parliament before the Third Reading of the Bill.
- 8.1.2 There will also be a separate petitioning period. This petitioning period will provide an opportunity for individuals or organisations specially and directly affected by the changes in the SES₃ and amendments in the AP₄ ES to petition on the changes or amendments to the Bill.
- 8.1.3 More information on who may petition against the Bill, and how to do so, is available on Parliament's website (<http://www.parliament.uk>).

High Speed Two (HS2) Limited

One Canada Square
London E14 5AB

T 020 7944 4908

E hs2enquiries@hs2.org.uk