

HIGH SPEED RAIL (LONDON - WEST MIDLANDS)

Supplementary Environmental Statement 3 and
Additional Provision 4 Environmental Statement

Volume 2 | Community forum area reports
CFA6 South Ruislip to Ickenham

October 2015

SES3 and AP4 ES 3.2.1.6



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Department for Transport

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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 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') 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

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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; 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.

Structure of this report

This volume of the SES₃ and AP₄ 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 ecological surveys conducted during 2015; and
- changes to the design or construction assumptions which do not require changes to the Bill.

Part 1 of each CFA report 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 SES₃ 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 AP₄ 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) in CFAs 7 – 26. The SES and AP2 ES, which was submitted in July 2015, updated the main ES and contained a number of further amendments to the design of the original scheme in CFAs 4 – 26. The SES2 and AP3 ES, which was submitted in September 2015, contained further updates to the main ES and reported the assessment of a number of amendments to the design of the original scheme in CFAs 1 – 5.
- 1.1.2 Since the submission of the main ES and subsequent SES and AP documents, updates to environmental baseline information and changes to 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 SES3 (Part 1) or AP4 ES (Part 2) of this document.
- 1.1.3 The Bill and associated Additional Provisions (APs) to the Bill described above, if enacted by Parliament, will provide the powers to construct, operate and maintain Phase One of HS2.
- 1.1.4 In order to differentiate between the original scheme and the subsequent changes, the terms set out in Table 1 are used:

Table 1: Scheme definitions

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 – 26
the AP1 revised scheme	the original scheme as amended by the AP submitted in September 2014	7 – 26
the SES scheme	the original scheme with the design changes described in the SES submitted in July 2015	4 – 26
the AP2 revised scheme	the SES scheme as amended by the AP2 submitted in July 2015	4 – 26
the SES2 scheme	the original scheme as updated by the SES scheme, with the design changes described in the SES2 submitted in September 2015	1 – 5 (i.e. this applies in the London area only)
the AP3 revised scheme	the SES2 scheme as amended by the AP3 submitted in September 2015	1 – 5 (i.e. this applies in the London area only)
the SES3 scheme	the SES2 scheme with the design changes described in the SES3 submitted in October 2015	4 – 26
the AP4 revised scheme	the SES3 scheme as amended by the AP4 submitted in October 2015	4 – 26

- 1.1.5 SES3 (Part 1 of this report) contains updated environmental baseline information and describes changes to the scheme that have occurred within the current limits and powers of the Bill, and therefore do not require an AP to the Bill. This includes:
- new baseline information with respect to ecological surveys conducted during 2015; and
 - changes to the design or to construction assumptions which do not require changes to the Bill.
- 1.1.6 Design changes assessed within the SES3 for this CFA comprise:
- extension to the porous section of the West Ruislip portal of the Northolt tunnel and realignment of footbridge; and
 - revised temporary diversions of a number of footpaths.
- 1.1.7 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.
- 1.1.8 The purpose of SES3 is to provide an assessment of any new or different likely significant environmental effects arising from the changes described.
- 1.1.9 There were no SES2 changes in this CFA, so the SES3 changes are compared to the SES scheme. There were AP2 amendments, so these are taken into account as appropriate.
- 1.1.10 The AP4 ES (Part 2 of this report) describes the likely significant effects of amendments to the design of the scheme, which require the use of land outside the original limits of the Bill, additional access rights, or other extensions to the powers conferred by the Bill, making it necessary to submit an AP to the Bill. The amendments assessed within the AP4 ES for this CFA include:
- removal of the Copthall retained structure and additional land required for earthworks at the pharmaceutical research facility;
 - additional land required for the amended sustainable placement proposals in CFA6 and CFA7;
 - revised temporary diversions of footpaths;
 - additional land required for the provision of a haul road through Uxbridge Golf Course in CFA7; and
 - provision of rail access track at West Ruislip London Underground depot.
- 1.1.11 The AP4 ES assesses each amendment separately for all relevant topics. The purpose of the AP4 ES is to provide an assessment of any new or different likely significant environmental effects arising from the amendments compared to the SES3 scheme, taking into account AP2 and AP3 amendments where relevant.
- 1.1.12 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

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(CoCP) submitted in support of the Bill. Implementation of these measures has been assumed in this SES₃ and AP₄ ES.

Part 1: Supplementary Environmental Statement

2 Summary of changes

2.1 New environmental baseline information

Ecology

- 2.1.1 Details of all amphibian surveys undertaken in this area during 2015 are provided in SES3 and AP4 ES, Volume 5: Appendix EC-001-001 and Volume 5 map series EC-04.
- 2.1.2 The additional baseline data does not generate any new or different significant effects and therefore is not reported in Section 3.

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

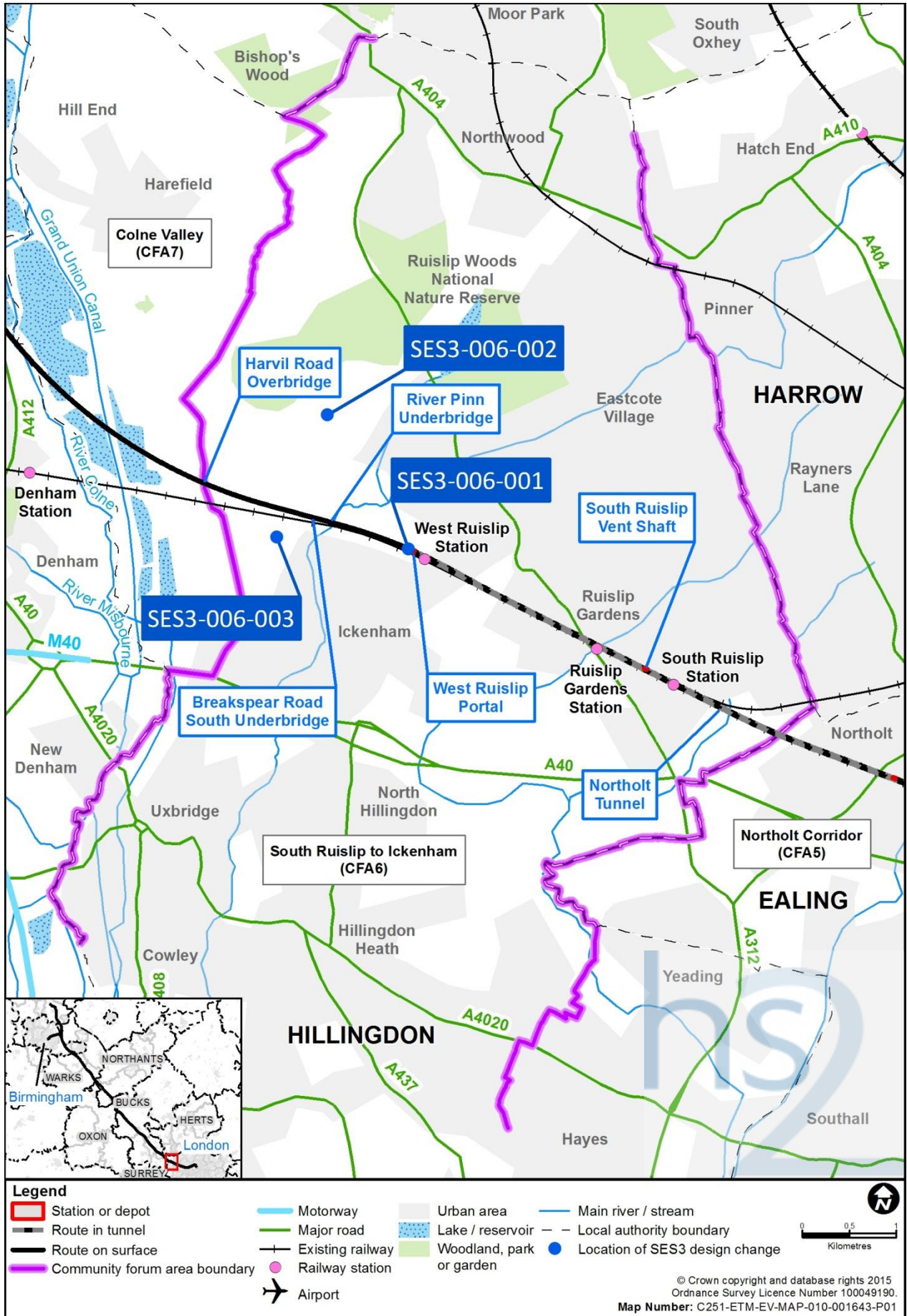
- 2.2.1 Table 2 provides a summary of the changes to the design or construction assumptions not requiring a change to the Bill which will result in new or different significant effects in the South Ruislip to Ickenham CFA (CFA6). Figure 1 shows the locations of the changes.

Table 2: Summary of changes to the design or construction assumptions not requiring a change to the Bill in CFA6

Name of design change or construction assumption	Description of the SES scheme	Description of the SES ₃ scheme
<p>Extension to the porous section of the West Ruislip portal of the Northolt tunnel and realignment of the footbridge</p> <p>SES₃-006-001</p>	<p>The Bill provides for a portal and approach ramp consisting of diaphragm walls forming an earth retaining box structure with an approximate length of 520m.</p>	<p>The porous section of the West Ruislip portal will be extended westwards by approximately 150m. The overall length of the portal will not increase. As part of this work, the Ickenham Stream (Canal Feeder) footpath U81 overbridge will be relocated further to the east.</p>
<p>Revised temporary diversion of footpaths U36, U37 and U38</p> <p>SES₃-006-002</p>	<p>The Bill provides for the temporary closure of footpaths U36, U37 and U38 during deposition of sustainable placement materials north of Newyears Green Lane. The Bill assumed concurrent closure of the three footpaths and a diversion utilising Breakspear Road North and the existing footpath west of Bayhurst Wood. The main ES stated that diversion of footpaths U36, U37 and U38 would be required for a period of approximately seven years.</p>	<p>The revised diversions of footpaths U36, U37 and U38 are based on phasing of the sustainable placement of excavated materials in this area, so that U38 is diverted around the sustainable placement site, via a segregated route within the associated land, and only one of footpaths U36 or U37 is closed at any one time. These diversion routes and closures will only be in place during the deposition of excavated materials at the sustainable placement areas, which will commence in Q2 2018 and last for approximately one year.</p>
<p>Revised temporary diversion of footpath U49</p> <p>SES₃-006-003</p>	<p>The Bill provides for the temporary closure and diversion of footpath U49 to accommodate the Northolt Tunnel and Earthworks Main Compound and areas for sustainable placement.</p> <p>The main ES stated that U49 would be closed between Harvil Road and Breakspear Road South and diverted via Breakspear Road South, Swakeleys Road and Harvil Road.</p> <p>The diversion would have been in place for a period of approximately seven years, with permanent reinstatement along its existing alignment.</p>	<p>Since submission of the Bill, a revised diversion route for footpath U49 is proposed. Footpath U49 will be diverted from the existing alignment along the south-eastern edge of the Northolt Tunnel and Earthworks main construction compound and part way along the western boundary adjacent to Harvil Road. The diversion of footpath U49 will be in place for the full duration of construction works in this area (2017–2026).</p>

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Figure 1: Locations of design changes not requiring a change to the Bill in CFA6



Description of changes to the design or to construction assumptions

Extension to the porous section of the West Ruislip portal of the Northolt tunnel and realignment of the footbridge (SES3-006-001)

- 2.2.2 The Bill provides for a portal and approach ramp consisting of diaphragm walls forming an earth retaining box structure with an approximate length of 520m (refer to maps CT-05-018 and CT-06-018 in main ES Volume 2, CFA6 Map Book).
- 2.2.3 The portal structure comprises a ramp structure which would ascend to ground level and consists of diaphragm walls, a porous portal hood and portal structure. It included the following key permanent features:
- the covered section of the portal structure, which will provide a launch chamber for two tunnel boring machines, with a base slab 15m below ground level;
 - a surface headhouse on top of the portal structure, approximately 32m long by 30m wide and 5.5m above the portal;
 - diversion of the Ickenham Stream (canal feeder), on the north side of the ramp structure, westwards to the River Pinn; and
 - realignment of a footpath, the Hillingdon Trail (footpaths U81 and R146), via a footbridge over the ramp structure.
- 2.2.4 Since submission of the Bill, the engineering design of the portal has been further developed. As a result, the porous section of the portal will be extended westwards by approximately 150m. The overall length of the portal will not increase. As part of this work, the Ickenham Stream (Canal Feeder) footpath U81 overbridge will be relocated to the east of the location in the original scheme (refer to maps CT-05-018 and CT-06-018 in the SES3 and AP4 ES Volume 2, CFA6 Map Book). The land required by the design change is located within the existing limits of the Bill.
- 2.2.5 The extension of the West Ruislip portal results in new or different significant effects for sound, noise and vibration and these are reported in Section 3.

Revised temporary diversion of footpaths U36, U37 and U38 (SES3-006-002)

- 2.2.6 The Bill provides for the temporary closure of footpaths U36, U37 and U38 during deposition of sustainable placement materials north of Newyears Green Lane. The Bill assumed concurrent closure of footpaths U36, U37 and U38 and a diversion utilising Breakspear Road North and the existing footpath west of Bayhurst Wood (refer to maps CT-05-019a-R1 and CT-06-019-R1 in main ES Volume 2, CFA6 Map Book).
- 2.2.7 The temporary diversion routes proposed in the main ES were as follows:
- footpath U36: diverted approximately 2300m, from the start of footpath U36, along Newyears Green Lane, Breakspear Road North and through Bayhurst Wood Country Park to the junction of footpaths U35, U36 and U37;
 - footpath U37: diverted approximately 2500m, from the start of footpath U36, along Newyears Green Lane, Breakspear Road North and through Bayhurst Wood Country Park to the junction of footpaths U35, U36 and U37; and

- footpath U38: diverted approximately 300m, from the start of footpath U38, along Newyears Green Lane and Breakspear Road North to the end of footpath U38 adjacent to the junction of Breakspear Road North and Fine Bush Lane.

2.2.8 The main ES stated that diversion of footpaths U36, U37 and U38 would be required for a period of approximately 7 years.

2.2.9 Since submission of the Bill, revised temporary diversion routes for footpaths U36, U37 and U38 are proposed based on phasing of sustainable placement of excavated materials in this area (refer to map CT-05-019a-R1 in the SES3 and AP4 ES Volume 2, CFA6 Map Book).

2.2.10 The revised temporary diversion routes are as follows:

- footpaths U36 and U37 will remain in their current position with only one being closed at any one time, therefore maintaining a link between footpath U35 and Newyears Green Lane with a diversion distance of less than 200m during each closure; and
- footpath U38: diverted approximately 700m, around the sustainable placement site, within the field boundaries along the northern edge of Newyears Green Lane and western edge of Breakspear Road North. The footpath is to be segregated from the deposition works by a temporary fence.

2.2.11 These diversion routes and closures will only be in place during the deposition of excavated materials at the sustainable placement areas, which will commence in Q2 2018 and last for approximately one year.

2.2.12 Where temporary haul routes intersect the alignment of footpaths U36 and U37, crossing points will be in place to ensure users of the public rights of way can cross the alignment of the haul routes in a safe manner.

2.2.13 The revised temporary diversions of the three footpaths are located within the existing limits of the Bill.

2.2.14 The revised temporary diversions of footpaths U36, U37 and U38 results in new or different significant effects for traffic and transport and these are reported in Section 3.

Revised temporary diversion of footpath U49 (SES3-006-003)

2.2.15 The Bill provides for the temporary closure and diversion of footpath U49 to accommodate the Northolt Tunnel and Earthworks Main Compound and areas for sustainable placement (refer to maps CT-05-019a-L1 and CT-06-019a-L1 in the main ES Volume 2, CFA6 Map).

2.2.16 The diversion route proposed for footpath U49 in the main ES was approximately 1,200m long, from the start of footpath U49, south on Breakspear Road South and Swakeleys Road and north along Harvil Road.

2.2.17 The diversion would have been for a period of approximately seven years, with permanent reinstatement along its existing alignment.

- 2.2.18 Since submission of the Bill, a revised diversion route for footpath U49 is proposed. Footpath U49 will be diverted approximately 850m along the south-eastern edge of the Northolt Tunnel and Earthworks main construction compound and part way along the western boundary, adjacent to Harvil Road. The footpath is to be segregated from the works with a temporary fence and from Harvil Road by the existing hedgerow/fence (refer to maps CT-05-019a-L1 and CT-06-019a-L1 in the SES3 and AP4 ES Volume 2, CFA6 Map Book). The diversion of footpath U49 will be in place for the full duration of construction works in this area (2017–2026).
- 2.2.19 Where the alignment of the revised diversion is intersected by a temporary haul road associated with sustainable placement, crossing points will be in place to ensure users of the public right of way can cross the alignment of the haul route in a safe manner. The temporary haul route is anticipated to be in place for approximately three years.
- 2.2.20 The revised temporary diversion of footpath U49 does not give rise to new or different significant effects for any environmental topics and is therefore not considered further in this report.

2.3 Topics included in the SES3 assessment

- 2.3.1 The changes described above in Sections 2.1 to 2.2 result in new or different significant effects in respect of sound, noise and vibration and traffic and transport.

3 Assessment of changes

3.1 Sound, Noise and Vibration

Introduction

- 3.1.1 This section of the report describes the environmental baseline in relation to sound, noise and vibration 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 those of the SES2 scheme.

Scope, assumptions and limitations

- 3.1.2 The assessment scope, key assumptions and limitations for the sound, noise and vibration assessment 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.
- 3.1.3 Local assumptions and limitations for sound, noise and vibration are set out in the main ES (Volume 2, CFA6 Report: Section 11.3).

SES3 changes of relevance to this assessment

- 3.1.4 The only SES3 change of relevance to this assessment is the extension to the porous section of the West Ruislip portal of the Northolt tunnel and realignment of the footbridge (SES3-006-001).

Environmental baseline

Existing baseline

- 3.1.5 The existing baseline sound and vibration information for this area is described in the main ES (Volume 2, CFA6 Report: Section 11.2). Baseline sound levels representative of the assessment locations affected by the SES changes have been used in the construction and operational assessments.

Future baseline

Construction (2017)

- 3.1.6 The future baseline for construction in 2017, and construction traffic in 2021, remains unchanged from that reported in the main ES (Volume 2, CFA6 Report: Section 11.2).
- 3.1.7 Volume 5, Appendix CT-004-000 of the SES3 and AP4 ES provides details of the developments that are assumed to have been implemented by 2017, additional to those identified in the main ES and SES and AP2 ES.
- 3.1.8 None of the identified developments affect the assessment of the SES3 scheme's likely construction impacts on sound, noise and vibration.

Operation (2026)

- 3.1.9 The future baseline for operation in 2026 remains unchanged from that reported in the main ES (Volume 2, CFA6 Report: Section 11.2).

- 3.1.10 Volume 5, Appendix CT-004-000 of the SES₃ and AP₄ ES provides details of the developments that are assumed to have been implemented by 2026, additional to those identified in the main ES and SES and AP₂ ES.
- 3.1.11 None of the identified developments affect the assessment of the SES₃ scheme's likely operation impacts on sound, noise and vibration.

Effects arising during construction

- 3.1.12 The assessment of construction noise and vibration assumes the implementation of the principles and management processes set out in the draft CoCP (main ES Volume 5: Appendix CT-003-000).
- 3.1.13 There are no new or different significant construction effects for sound, noise and vibration as a result of the proposed design change, in comparison with the main ES and SES.

Effects arising from operation

Avoidance and mitigation measures

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

Assessment of impacts and effects

- 3.1.15 The SES and AP₂ ES identified a likely significant adverse noise effect on a community basis at approximately 100 dwellings and associated shared community open areas in the vicinity of The Greenway and Hoylake Crescent and Bushey Road in the community of Ickenham, identified as OSV6-Co1¹ on SES and AP₂ ES Map Series SV-01 and SV-02 (SES and AP₂ ES Volume 5, CFA6 Map Book).
- 3.1.16 An assessment has been undertaken to determine whether operational noise levels from the SES₃ design change would result in a new or different likely significant effect, using the significance criteria detailed in the main ES (Volume 5: Appendix SV-001-000).
- 3.1.17 The predicted operational sound and vibration levels as a result of this design change are presented in Table 3

¹ Significant operational noise effects are identified with a unique identification number, OSVXX-XXX. Further detail on these effects can be found in Volume 5, Appendix SV004-006 of the main ES.

Table 3: Operational airborne sound level, noise impacts and effects

Assessment Location		Impact criteria										Significance criteria ²							Significant effect	
ID	Area represented	AP ₄ revised scheme only (year 15 traffic)			Do nothing (Opening year baseline)			Do something (Opening year baseline plus year 15 traffic) ³		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact		Mitigation of effect
		D ⁴	N ⁵	M ⁶	D	N	M	D	N	D	N									
410569	The Greenway, Ickenham	57	48	71/74	59	53	57	61	54	2	1	A	11	R	T	-	-	-	-	
410650	The Greenway, Ickenham	54	45	68/71	48	45	53	55	48	7	3	A	16	R	T	-	-	-	-	OSV6-Co1
412058	Hoylake Crescent, Ickenham	51	42	63/66	49	44	47	53	46	4	2	A	11	R	T	-	-	-	-	OSV6-Co1
413146	Bushey Road, Ickenham	50	41	62/65	49	47	44	51	43	2	0	A	17	R	T	-	-	-	-	

² Where the change cell is coloured red this denotes a major airborne noise impact, orange denotes a moderate airborne noise impact and yellow denotes a minor airborne noise impact.

Where the type of effect cell contains NA – this means generally no adverse effects; A - an adverse effect; S - a significant adverse effect. For further information refer to the main ES Volume 5: Appendix SV-001-000.

Where the type of receptor cell contains R – this means residential; B- is non-residential. T – is traditional building construction

- the forecast adverse effects are not considered to be significant on a community basis (further information on methodology is provided in the main ES Volume 5: Appendix SV-001-000).

Where the significant effect cell is coloured purple this denotes a significant effect has been identified

³ Where the SES₃ scheme modifies an existing source, i.e. road or railway realignments, the SES₃ scheme only level in the table includes the sound from the modified source. In this situation the Do something (Opening year baseline + Year 15 traffic) level has been corrected so as to not double count the sound associated with the road or railway on its new and existing alignment.

⁴ D - Day - L_{pAeq,07:00-23:00}.

⁵ N - Night - L_{pAeq,23:00 - 07:00}.

⁶ M - Max - L_{pAFmax}. In the SES₃ scheme only column, two values are presented. The first is the value for the HS₂ mitigated train and the second is the value for the TSI compliant train. For further information refer to Volume 5: Appendix SV-001-000.

Assessment Location		Impact criteria										Significance criteria ²								Significant effect
ID	Area represented	AP ₄ revised scheme only (year 15 traffic)			Do nothing (Opening year baseline)			Do something (Opening year baseline plus year 15 traffic) ³		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation of effect	
		D ⁴	N ⁵	M ⁶	D	N	M	D	N	D	N									
419154	Hoylake Crescent, Ickenham	51	42	64/67	52	44	44	52	44	1	0	A	25	R	T	-	-	-	-	
419263	Hoylake Crescent, Ickenham	52	43	72/75	49	47	57	54	48	5	1	A	11	R	T	-	-	-	-	OSV6-Co1
422671	The Greenway, Ickenham	52	42	65/68	48	45	53	53	47	5	2	A	11	R	T	-	-	-	-	OSV6-Co1
422998	The Greenway, Ickenham	52	43	68/70	59	53	57	60	53	1	0	A	10	R	T	-	-	-	-	
423037	The Greenway, Ickenham	55	46	72/75	59	53	57	60	54	2	1	A	10	R	T	-	-	-	-	
700377	The Greenway, Ickenham	58	49	68/70	59	53	57	61	54	3	1	A	5	R	T	-	-	-	-	OSV6-Co1

- 3.1.18 The design change reduces the operational airborne noise level associated with the SES₃ scheme at those locations closest to the change. The number of residential properties affected (within the significant adverse noise effect reference OSV6-Co1) is predicted to reduce from approximately 100 in the SES to approximately 55 in the SES₃ scheme.
- 3.1.19 There will remain a likely significant adverse operational noise effect at approximately 55 residential properties in the vicinity of The Greenway and Hoylake Crescent in the community of Ickenham, identified as OSV6-Co1 on SES₃ and AP₄ ES Map Series SV-01 and SV-02 (SES₃ and AP₄ ES Volume 5, CFA6 Map Book). This is considered a different significant effect to that reported in the SES.
- 3.1.20 The design change does not alter the predicted operational ground-borne noise or vibration levels presented in the main ES and SES.

Other mitigation measures

- 3.1.21 No mitigation measures in addition to those identified in the main ES and SES are required.

Cumulative effects

- 3.1.22 This assessment has considered the potential cumulative construction noise effects of the scheme and other committed developments.
- 3.1.23 There are no new or different likely significant cumulative effects for sound, noise and vibration as a result of the SES₃ changes interacting with one another, the AP₂ amendments, or any relevant committed development interacting with the SES₃ scheme.

Summary of likely residual significant effects

- 3.1.24 The SES₃ scheme will give rise to a different operational residual significant effect compared to that reported in the main ES and SES, specifically that the number of impacted properties included within significant effect number OSV6-Co1, on the community of Ickenham, reduces from approximately 100 to approximately 55.

3.2 Traffic and transport

Introduction

- 3.2.1 This section of the report describes the environmental baseline in relation to traffic and transport 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 SES scheme, taking into account any relevant AP₂ amendments.

Scope, assumptions and limitations

- 3.2.2 The assessment scope, key assumptions and limitations for traffic and transport 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 change of relevance to this assessment is revised temporary diversions of footpaths U₃₆, U₃₇ and U₃₈ (SES₃-006-002).
- 3.2.4 This change is considered to have the potential to result in new or different likely residual significant effects for traffic and transport.

Environmental baseline

- 3.2.5 The baseline traffic and transport information for CFA₆, South Ruislip to Ickenham is as described in the main ES (Volume 2, CFA₆ Report: Section 12) and the SES and AP₂ ES.

Future baseline

Construction

- 3.2.6 The future baseline for construction is as reported in the main ES (Volume 2, CFA₆, Section 12) and the SES and AP₂ ES.

Operation (2026 and 2041)

- 3.2.7 The future baselines for operation remain unchanged from those reported in the main ES (Volume 2, CFA₆, Section 12), and the SES and AP₂ ES.

Effects arising during construction

Avoidance and mitigation measures

- 3.2.8 No mitigation measures in addition to those identified in the main ES and Part 1 of the SES and AP₂ ES are required.

Assessment of impacts and effects

Temporary effects

- 3.2.9 The main ES reported temporary diversion to footpaths U₃₆, U₃₇ and U₃₈ that incurred significant additional travel distances. The SES scheme changes result in changes to the diversion distances as set out below:
- U₃₆ – the main ES reported a diversion that increased the travel distance by approximately 2,300m and this is reduced to approximately 200m in the SES₃ scheme;
 - U₃₇ – the main ES reported a diversion that increased the travel distance by approximately 2,500m and this is reduced to approximately 200m in the SES₃ scheme; and
 - U₃₈ – the main ES reported a diversion that increased the travel distance by approximately 300m and this is increased to approximately 700m in the SES₃ scheme.
- 3.2.10 The changes to U₃₆ and U₃₇ result in different significant effects due to the reduced diversion distance. The changes to both footpaths were reported as moderate adverse significant effects in relation to severance in the main ES. With the reduction in the

diversions in the SES₃ scheme, these both become minor adverse significant effects. The diversion of U₃₈ was reported to be a minor adverse significant effect in the main ES and this is unchanged by the SES₃ scheme.

Permanent effects

- 3.2.11 Permanent effects of construction on traffic and transport are reported under operations.

Other mitigation measures

- 3.2.12 No changes to the mitigation measures reported in Volume 2, CFA6 of the main ES are required.

Cumulative effects

- 3.2.13 The above assessment has taken into account cumulative effects, including planned development by taking account of background traffic growth, as well as traffic and transport impacts of works being undertaken in other areas.

- 3.2.14 There are no new or different likely significant cumulative effects for traffic and transport as a result of the SES₃ scheme interacting with AP₂ amendments.

Summary of likely residual significant effects

- 3.2.15 The changes to temporary footpath diversions of U₃₆ and U₃₇ result in the moderate adverse significant residual severance effects on users in the main ES reducing to a minor adverse significant residual effects in the SES₃ scheme.

- 3.2.16 The significant residual effects that result from construction of the SES₃ scheme are shown on Map Series SES₃ AP₄ TR-03-009 (Volume 5, Traffic and Transport Map Book).

Effects arising from operation

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

Part 2: Additional Provision 4

Environmental Statement

4 Summary of amendments

- 4.1.1 Table 4 provides a summary of the amendments in the South Ruislip to Ickenham CFA (CFA6) and Figure 2 shows the locations.
- 4.1.2 Amendments in this CFA result in significant changes to waste arisings, which are reported in Volume 5, Appendix WM-001-000 of the SES3 and AP4 ES.
- 4.1.3 An assessment of the likely significant environmental effects associated with the disposal of construction, demolition, excavation, and operational waste has been undertaken for the SES3 scheme and AP4 revised scheme as a whole. See Volume 3, Section 20 of the SES3 and AP4 ES for further information.

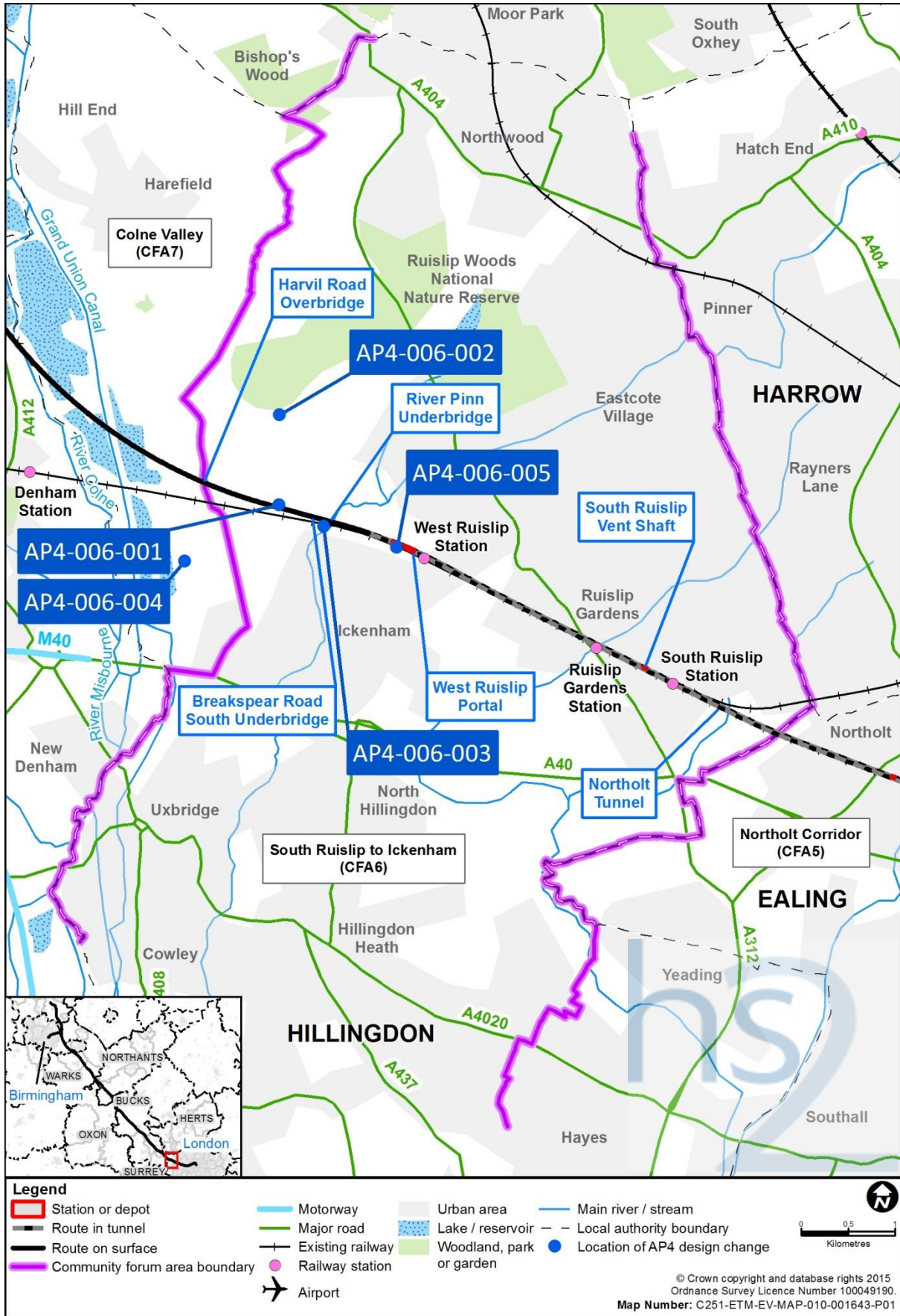
Table 4: Summary of amendments in CFA6

Name of amendment	Description of the SES ₃ scheme	Description of the AP ₄ revised scheme
<p>Removal of the Copthall retained structure and additional land required for earthworks at the pharmaceutical research facility</p> <p>AP4-006-001</p>	<p>The Bill provides for the route in this area being predominantly in cutting, with a maximum depth of 20m below existing ground level. Key permanent features of this section included the Copthall retained structure south of the pharmaceutical research facility off Breakspear Road South, required in order to maintain existing operations at this site. The Bill included the demolition of 12 buildings to the south section of the pharmaceutical research facility.</p>	<p>The Copthall Retained Structure will not be included in the AP₄ revised scheme so that the cutting is continuous in this area. An additional four buildings within the pharmaceutical research facility will be demolished. It is assumed that some existing operations will remain on the site.</p>
<p>Additional land required for the amended sustainable placement proposals in CFA6 and CFA7 and the associated diversion of footpath U50</p> <p>AP4-006-002</p>	<p>The Bill provides for three areas within CFA6 and one area within CFA7 for the permanent sustainable placement of surplus excavated materials arising primarily from the construction of the Brackenbury and Copthall cuttings. One is located to the north of Newyears Green Lane and two are located on the land between Breakspear Road South and Harvil Road to the south of the route. A fourth area is associated with these sustainable placement areas and is located to the south-east of South Harefield in CFA7 and is assessed in the main ES CFA7 report.</p>	<p>Since submission of the Bill, the proposed sites identified for sustainable placement of surplus excavated material and the sustainable placement proposals within CFA6 and CFA7 have been further refined to accommodate: changes in the construction programme; modification of the permanent sustainable placement sites, three additional temporary material stockpiles, the removal from Bill limits of the permanent placement site within CFA7, the addition of two temporary material stockpiles in CFA7, and the diversion of footpath U50 in CFA7.</p>
<p>Revised temporary diversion of footpaths U43, U45 and U47</p> <p>AP4-006-003</p>	<p>The Bill provides for the temporary closure of footpath U43 for a period of approximately three months and diversion via U45, U46 and Breakspear Road South whilst the proposed flood compensation area, across which the footpath passes, is excavated.</p> <p>Footpaths U45 and U47 would be temporarily closed following reinstatement of footpath U43, for approximately seven years, for the construction of a new embankment and railway bridge over the River Pinn. The proposed diversionary route is via the Celandine Route, Breakspear Road South and footpath U43.</p>	<p>Footpath U43 will be temporarily diverted in the AP₄ revised scheme along footpath U45, along the east side of the River Pinn, to the adjacent Footpath U46 (170m to south) during construction. At this stage of construction footpath U46 will still be in use. Footpath U43 will then be diverted along a route parallel with Breakspear Road South. Footpath U43 will be reinstated prior to closure of footpath U45.</p> <p>Footpath U45 will be temporarily closed from late June 2017. It will be diverted along footpath U43, along a route parallel to Breakspear Road South, via a segregated route under the existing Chiltern Line underbridge, then via a temporary footpath to a temporary footbridge over the River Pinn, to join up with footpath U47 to the south of the existing Chiltern Main Line (CML).</p> <p>The temporary footpath parallel to Breakspear Road South will be from Grays Cottages to Gatemead Farm. The section of Footpath U47, which provides the north-south connectivity will remain closed during the construction of the River Pinn bridge</p>

Name of amendment	Description of the SES ₃ scheme	Description of the AP ₄ revised scheme
		and while the haul road crossing the footpath is in use. This is expected to last for approximately 14 months commencing in the third quarter of 2017.
<p>Additional land required for the provision of a haul road through Uxbridge Golf Course</p> <p>AP₄-006-004</p>	<p>The Bill provides for the A₄₀ Western Avenue, the B₄₆₇ Swakeleys Road and Harvil Road to be used as a construction traffic route.</p>	<p>Temporary provision of a haul road through Uxbridge Golf Course, located within CFA₇, is required to reduce the level of construction traffic on Swakeley Road/Harvil Road. The haul road will connect at its southern end with the eastbound slip road to the A₄₀ Western Avenue/B₄₆₇ Swakeleys Road roundabout. The southern section of the haul road will pass to the west of, and parallel to, The Drive. The northern section will pass through Uxbridge Golf Course and land to the west of Harvil Road within CFA₇. The haul road will connect with Harvil Road at its northern end.</p> <p>The haul road will be constructed from the north using the Northolt Tunnel and Earthworks Main Compound (described in the main ES). It will be constructed from the south using an additional compound within CFA₇: the Uxbridge Golf Course Haul Road Satellite Compound.</p>
<p>Provision of rail access track to the West Ruislip depot</p> <p>AP₄-006-005</p>	<p>The Bill provides for the removal of two rail sidings, that London Underground Ltd (LUL) use occasionally to hold trains prior to entering their depot at West Ruislip, as part of the Northolt tunnel portal works</p>	<p>The AP₄ revised scheme proposes a new link that connects the CML to the LUL depot on the existing railway network. This will provide direct access from the west to the LUL depot at West Ruislip (there is already access to the depot from the east). The link allows a more direct access to the LUL depot and removes the need to temporarily hold trains prior to entering the depot from the west.</p>

SES3 and AP4 ES Volume 2 – CFA 6, South Ruislip to Ickenham

Figure 2: Locations of amendments in CFA6



5 Assessment of amendments

5.1 Removal of the Cophall retained structure and additional land required for earthworks at the pharmaceutical research facility (AP4-006-001)

- 5.1.1 The Bill provides for the route in this area being predominantly in cutting, with a maximum depth of 20m below existing ground level. Key permanent features of this section included the Cophall retained structure south of the pharmaceutical research facility off Breakspear Road South, required in order to maintain existing operations at this site. The Bill included the demolition of 12 buildings in the south of the pharmaceutical research facility.
- 5.1.2 Since submission of the Bill, the operators of the pharmaceutical research facility have indicated that certain operations carried out at the pharmaceutical research facility will be relocated to an alternative site. As a result, the Cophall retained structure will not be included in the AP4 revised scheme. The cutting will be continuous in this area. This will cause a less than 1% increase in the volume of excavated material generated in the West Ruislip area.
- 5.1.3 An additional four buildings within the pharmaceutical research facility will be demolished in addition to those buildings described within the main ES (refer to map CT-05-019a in the SES and AP4 ES Volume 2, CFA6 Map Book). It is assumed some existing operations will remain on the site to the northeast.
- 5.1.4 There are no changes to the construction programme and worker numbers relative to the main ES.
- 5.1.5 The removal of the Cophall retained structure and additional land required for earthworks at the pharmaceutical research facility is not considered to make changes that require a reassessment of the environmental effects or proposed mitigation as set out in the main ES for: air quality, community, cultural heritage, land quality, traffic and transport, and water resources and flood risk. However there were changes where reassessment was considered to be required for: agriculture, forestry and soils, ecology, landscape and visual assessment, socio-economics, and sound, noise and vibration.

Agriculture, Forestry and Soils

Introduction

- 5.1.6 This section of the report describes the environmental baseline in relation to agriculture, forestry and soils that is relevant to the assessment. It then identifies any new or different likely significant environmental effects as a result of the amendment, compared to those of the SES3 scheme.

Scope, assumptions and limitations

- 5.1.7 The assessment scope, key assumptions and limitations for agriculture, forestry and soils 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.

- 5.1.8 The area of agricultural land affected by the amendment is small and will not alter the significance of effect, or result in a different effect, in terms of the loss of best and most versatile (BMV) agricultural land or forestry land within the CFA. The route-wide effects on BMV land and forestry land are reported in Volume 3.

Existing baseline

- 5.1.9 The baseline agriculture information for CFA6 South Ruislip to Ickenham is described in the main ES (Volume 2, CFA Report 6: Section 3).
- 5.1.10 The agricultural land affected by the amendment is part of the pharmaceutical research facility (farm holding reference CFA06/7) and is low quality grassland used for stock grazing. The holding extends to some 36.0ha.

Future baseline

Construction (2017)

- 5.1.11 Volume 5, Appendix CT-004-000 of the SES₃ and AP₄ ES provides details of the developments that are assumed to have been implemented by 2017, additional to those identified in the main ES and SES and AP₂ ES.
- 5.1.12 None of the identified developments affect the assessment of the AP₄ revised scheme's likely construction impacts on agriculture, forestry and soils.
- 5.1.13 Most existing Environmental Stewardship agreements will expire in 2015 and will be replaced by a new environmental land management scheme (Countryside Stewardship) which, together with the new greening measures introduced by Common Agricultural Policy reform, will affect the detailed management of individual farm holdings. These are not expected to change fundamentally the baseline circumstances described.

Operation (2026)

- 5.1.14 Volume 5, Appendix CT-004-000 of the SES₃ and AP₄ ES provides details of the developments that are assumed to have been implemented by 2026, additional to those identified in the main ES and SES and AP₂ ES.
- 5.1.15 None of the identified developments affect the assessment of the AP₄ revised scheme's likely operational impacts on agriculture, forestry and soils.

Effects arising during construction

- 5.1.16 A further 0.2ha of agricultural land will be required, which increases the total area removed permanently to 27.3ha. This represents 76% of the holding. The requirement for 27.1ha for the construction of the original scheme was assessed as a moderate adverse significant effect; and the addition of this small area of land does not alter that assessment. Overall, this amendment does not give rise to a different significant effect to that reported in the main ES.

Effects arising from operation

- 5.1.17 The amendment will not give rise to a new or different significant operational effect on agriculture, forestry and soils, and will not change the level of significance of the effects reported in the main ES.

Mitigation and residual effects

- 5.1.18 No mitigation measures in addition to those identified in the main ES are required.
- 5.1.19 No new or different residual effects on agriculture, forestry and soils occur as a consequence of the amendment. The significant residual effects of the AP₄ revised scheme in this area are therefore unchanged from those reported in the main ES.

Cumulative effects

- 5.1.20 There are no new or different likely significant cumulative effects for agriculture, forestry and soils as a result of the proposed amendment acting in combination with another amendment in AP₄, or in AP₂, or as a result of any relevant committed development interacting with the AP₄ revised scheme.

Ecology

Introduction

- 5.1.21 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 amendment, compared to those of the SES₃ scheme.

Scope, assumptions and limitations

- 5.1.22 Updates to the scope of the assessment for ecology are set out in Volume 1 of the SES₃ and AP₄ 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-001-000/01) and the SMR Addendum (Volume 5: Appendix CT-001-000/02) of the main ES. .
- 5.1.23 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 AP₄ revised scheme.

Existing baseline

- 5.1.24 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 undertaken between June and August 2014, and aerial photography.
- 5.1.25 A summary of the baseline information relevant to the assessment of the amendment is provided below. This takes account of any relevant 2015 survey information provided in SES₃ and AP₄ ES Volume 5: Appendix EC-001-001, and SES and AP₂ ES, Volume 5: Appendix EC-001-001. For those receptors described in the main ES, further details are provided in Volume 2, CFA6 Report: Section 7 of the main ES and in Volume 5, including maps EC-01 to EC-12 of the main ES.

Designated sites

- 5.1.26 There are no designated sites relevant to the assessment.

Habitats

- 5.1.27 The land required for the amendment contains a new area of 0.5ha amenity grassland and buildings within the pharmaceutical research facility.

Protected and/or notable species

- 5.1.28 Bat emergence surveys in 2014 (see SES and AP2 ES, Volume 5: Appendix EC-001-001) recorded a day roost used by a single bat (species not confirmed) in the residential building to the south-east of the pharmaceutical research facility in the land required for the amendment. The roost is likely to be a non-breeding roost, used by bats from the bat assemblages associated with the Brackenbury Farm and Gatemead Farm area reported in the main ES (assumed to support maternity roosts of common pipistrelles and non-maternity roosts of rarer bat species), which are both of up to county/metropolitan value.
- 5.1.29 Dormouse tube surveys were undertaken in 2014 (see SES and AP2 ES, Volume 5: Appendix EC-001-001) within a hedgerow to the north of the land required for the amendment and no dormouse were recorded. On this basis, dormouse is considered likely absent at the pharmaceutical research facility and in the area of the land required for the amendment.

Future baseline

Construction (2017)

- 5.1.30 SES3 and AP4 ES Volume 5: Appendix CT-004-000 provides details of the developments which are assumed to have been implemented by 2017, additional to those identified in the main ES and the SES and AP2 ES.
- 5.1.31 None of the identified developments affect the assessment of the amendment's likely construction impacts on ecology.

Operation (2026)

- 5.1.32 SES3 and AP4 ES Volume 5: Appendix CT-004-000 provides details of the developments which are assumed to have been implemented by 2026, additional to those identified in the main ES and the SES and AP2 ES.
- 5.1.33 None of the identified developments affect the assessment of the amendment's likely operational impacts on ecology.

Effects arising during construction

Avoidance and mitigation measures

- 5.1.34 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

- 5.1.35 The amendment will not generate any new or different significant effects on designated sites, or change the level of significance of the effects reported in the main ES.

Habitats

- 5.1.36 An additional area of 0.5ha of amenity grassland and buildings is required for the amendment. Amenity grassland has little ecological value, and hence the effect of the removal of the Copthall retained structure and additional land required for earthworks at the pharmaceutical research facility will not be significant, and will not change the level of significance of the effects reported in the main ES.

Protected and/or notable species

- 5.1.37 The main ES reported that the loss of roost sites, including potential pipistrelle maternity roosts at the pharmaceutical research facility would result in significant effects at up to the county/metropolitan level on the bat populations associated with the Brackenbury Farm and Gatemead Farm area. An additional bat roost (likely a non-breeding roost used by low number of bats) will be lost in the land required for the amendment. Depending on the species present, the loss of the additional roost would result in a different significant effect on either or both of the bat populations associated with the Brackenbury Farm and Gatemead Farm area. However, in all cases these different significant effects would not change the level of significance of the effects reported in the main ES.

Cumulative effects

- 5.1.38 There are no new or different likely significant cumulative effects for ecology as a result of the proposed amendment acting in combination with another amendment in AP₄, or in AP₂, or as a result of any relevant committed development interacting with the AP₄ revised scheme.

Mitigation and residual effects

Other mitigation measures

- 5.1.39 The loss of the additional bat roost will be compensated for by the provision of alternative compensatory roosts within the Bill limits in accordance with the Ecology technical note: Ecological principles of mitigation (the main ES, Volume 5: Appendix CT-001-000/2).

Residual effects

- 5.1.40 No new or different residual effects on ecological receptors occur as a consequence of the amendment. The significant residual effects of the AP₄ revised scheme in this area are therefore unchanged from those reported in the main ES the SES and the SES₃.

Effects arising from operation

- 5.1.41 The proposed amendment will not give rise to new or different significant operational effects on ecological receptors and will not change the level of significance of the effects reported in the main ES the SES and the SES3.

Landscape and visual assessment

Introduction

- 5.1.42 This section of the report describes the environmental baseline in relation to landscape and visual that is relevant to the assessment. It then identifies any new or different likely significant environmental effects as a result of the amendment, compared to those of the SES3 scheme.

Scope, assumptions and limitations

- 5.1.43 The assessment scope, key assumptions and limitations for landscape and visual 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. An update to the methodology for the landscape and visual assessment is also described in Volume 1 of the AP1 ES.

Existing baseline

- 5.1.44 The pharmaceutical research facility is located within Harefield Farmland Landscape Character Area (LCA) as described in the main ES (Volume 2, CFA6 Report: Section 9).
- 5.1.45 The following viewpoints are located in close proximity and are described in the main ES (Volume 2, CFA6 Report: Section 9):
- Viewpoint 050.6.002: view south from the pharmaceutical research facility. Although part of the facility is to be demolished, other receptors in this location will remain;
 - Viewpoint 049.3.006: view east from the public right of way (PRoW) (Footpath U49) between Harvil Road and Breakspear Road South, to the south of the CML; and
 - Viewpoint 047.2.005: view north and north-west from Brackenbury House Farm and associated properties off Breakspear Road. There would be no clear view of the Copthall retained structure due to the presence of intervening vegetation and is not considered further.

Future baseline

Construction (2017)

- 5.1.46 SES3 and AP4 ES Volume 5: Appendix CT-004-000 provides details of the developments which are assumed to have been implemented by 2017, additional to those identified in the main ES and SES and AP2 ES.
- 5.1.47 None of the identified developments affect the assessment of the amendment's likely construction impacts on the landscape and visual assessment.

Operation (2026)

- 5.1.48 SES3 and AP4 ES Volume 5: Appendix CT-004-000 provides details of the developments which are assumed to have been implemented by 2026, additional to those identified in the main ES and SES and AP2 ES.
- 5.1.49 None of the identified developments affect the assessment of the amendment's likely operational impacts on the landscape and visual assessment.

Effects arising during construction

Landscape assessment

- 5.1.50 The Harefield Farmland LCA was assessed as being significantly affected by the original scheme and will also be affected by this amendment. The overall landscape condition is fair and the LCA is bordered by roads which reduce tranquillity locally, but overall the tranquillity of this character area is considered to be medium. The LCA is valued at a regional level as a result of its location within the green belt. Therefore, this area is considered to be of a high sensitivity to change. The main ES reported major adverse significant effects on the LCA during construction due to the scale of the works within the LCA, the presence of the Northolt Tunnel and earthworks main construction compound to the south of the existing railway corridor, the presence of sustainable placement sites, demolition of buildings, and removal of existing vegetation.
- 5.1.51 The landscape assessment of this amendment assumes that four of the existing buildings at the pharmaceutical research facility will be demolished. The other buildings on the site are assumed to remain.
- 5.1.52 The demolition of additional buildings will occur within the setting of the pharmaceutical research facility. The removal of the Cophall retained structure will allow the cutting to be continuous. However, this will still represent a substantial engineered structure within the landscape, albeit one that will better blend into the landscape. Therefore, the amendment will not give rise to a new or different significant effect and will not change the level of significance of the effect reported in the main ES.

Visual assessment

- 5.1.53 Viewpoint 050.6.002 view south from the pharmaceutical research facility was assessed as being affected by the original scheme and will also be affected by this amendment. The main ES reported a moderate adverse significant effect during construction due to open and direct views of construction activities from the commercial units in the foreground and middle ground. The relocation and demolition of parts of the facility will be visible from other commercial units within the site. The cutting would be a continuous element if the retained structure is not included and would be close to some commercial units. Overall, the amendment would represent a high magnitude of change due to the open and direct foreground and middle ground views of construction activities, as reported in the main ES and seen in the context of the prominent construction activity of the original scheme already taking place in this location. Therefore, the amendment will not give rise to new or different significant

effects on these receptors. and will not change the level of significance of the effects reported in the main ES.

- 5.1.54 Views east from the PRoW (Footpath U49) between Harvil Road and Breakspear Road South, to the south of the CML. Viewpoint 049.3.006 was assessed as being affected by the original scheme and will also be affected by this amendment. The main ES reported a major adverse significant effect during construction due to open and direct foreground and middle ground views from the PRoW of the Northolt tunnel and earthworks main site compound. The change resulting from the amendment would be a small component of the overall view and viewed in the context of the adjacent construction activity. Therefore the amendment will not give rise to new or different significant effects on these receptors.

Effects arising from operation

Landscape assessment

- 5.1.55 The Harefield Farmland LCA was assessed as being affected by the original scheme, and will also be affected by this amendment. The main ES reported a moderate adverse significant effect during year one of operation and minor adverse non-significant effect in year 15 and 60. The relocation of part of the pharmaceutical research facility will allow for the Brackenbury and Copthall Cuttings to be made continuous and accommodate some limited areas of additional tree planting relative to the original scheme. The remaining area of the research facility will not be affected. The mitigation planting will improve the integration of the cutting into the wider landscape but the large scale of the engineering works in the vicinity will still be prominent in year one of operation. The amendment will not give rise to new or different significant effects on the LCA and will not change the level of significance of the effects reported in the main ES.

Visual assessment

- 5.1.56 Viewpoint 050.6.002 (view south from the pharmaceutical research facility) was assessed as being affected by the original scheme and will also be affected by this amendment. The main ES reported moderate adverse significant effects during years 1, 15 and 60 of operation due to clear views of the original scheme immediately adjacent to the buildings and absence of planting adjacent to the original scheme. The revised scheme will be visible from existing buildings within the site, but seen in the context of the prominent elements of the original scheme in this location. The amendment will allow for the Brackenbury and Copthall Cuttings to be made continuous and accommodate some limited areas of additional planting relative to the original scheme. These changes would take place close to the boundaries of the original scheme and will be of a similar scale. The amendment will not give rise to new or different significant visual effects.
- 5.1.57 Views east from the PRoW (Footpath U49) between Harvil Road and Breakspear Road South, to the south of the CML, Viewpoint 049.3.006, was assessed as being affected by the original scheme and will also be affected by this amendment. The main ES reported a moderate adverse significant effect in year 1 of operation due to open but oblique, middle-ground views of the embankment and the cutting and the presence of the diverted overhead power lines. By year 15 and beyond to year 60 of operation, planting established on the slopes of the cutting as part of the original scheme will

have matured, providing additional screening to the elements of the original scheme. This will reduce effects to minor adverse and non-significant. The change resulting from the amendment would be a small component of the overall view and viewed in the context of the scheme. Therefore, the amendment will not give rise to new or different significant effects.

Mitigation and residual effects

- 5.1.58 No new or different residual effects on landscape and visual occur as a consequence of the removal of the Copthall retained structure and additional land required for earthworks at the pharmaceutical research facility. The significant residual effects of the AP4 revised scheme in this area are therefore unchanged from those reported in the main ES and SES.

Cumulative effects

- 5.1.59 There are no new or different likely significant cumulative effects for landscape or visual as a result of the proposed amendment acting in combination with another amendment in AP4, or in AP2, as a result of any relevant committed development interacting with the AP4 revised scheme.

Socio-Economics

Introduction

- 5.1.60 This section of the report describes the environmental baseline in relation to socio-economics that is relevant to the assessment. It then identifies any new or different likely significant environmental effects as a result of the amendment, compared to those of the SES3 scheme.

Scope, assumptions and limitations

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

Existing baseline

- 5.1.62 The baseline socio-economics information for CFA6 South Ruislip to Ickenham is described in the main ES (Volume 2, CFA Report 6: Section 10).

Future baseline

Construction (2017)

- 5.1.63 SES3 and AP4 ES Volume 5: Appendix CT-004-000 provides details of the developments which are assumed to have been implemented by 2017, additional to those identified in the main ES and SES and AP2 ES.
- 5.1.64 None of the identified developments affect the assessment of the amendment's likely construction impacts on socio-economics.

Operation (2026)

- 5.1.65 SES3 and AP4 ES Volume 5: Appendix CT-004-000 provides details of the developments which are assumed to have been implemented by 2026, additional to those identified in the main ES and SES and AP2 ES.
- 5.1.66 None of the identified developments affect the assessment of the amendment's likely operational impacts on socio-economics.

Effects arising during construction

- 5.1.67 The amendment will result in the displacement of part of the pharmaceutical research facility on Breakspear Road South. The majority of jobs at this facility are likely to be skilled and specialist occupations within the field of scientific research and development. Given the nature of the operations at this business, it is likely that the occupier may have difficulties in finding suitable alternative local premises. The effect on this business and its employees is assessed overall to be moderate adverse and is therefore significant.
- 5.1.68 It is estimated that the amendment would result in the displacement or possible loss of a total of 46 jobs in addition to those identified as lost in the main ES within the South Ruislip to Ickenham area. However, taking into account total employment within the local borough (186,000) the impact on the local economy from the loss/relocation of jobs is considered to be relatively minor compared to the scale of economic activity and opportunity in the area.

Effects arising from operation

- 5.1.69 The proposed amendment will not give rise to a new or different significant effect during operation and will not change the level of significance of the effects reported in the main ES or SES.

Mitigation and residual effects

- 5.1.70 HS2 Ltd is working with the pharmaceutical research facility to minimise disruption to their activities, and to assist them in relocating any displaced operations to an alternative facility that is not included as part of the AP4 revised scheme.
- 5.1.71 Based on the assumption that displaced operations at the pharmaceutical research facility will be reprovided at an alternative site it is assessed that the AP4 revised scheme will not result in a residual permanent significant effect on this business.
- 5.1.72 No significant residual effects of relevance to this amendment were reported in the main ES and there are therefore no changes to this assessment arising from this amendment.

Cumulative effects

- 5.1.73 There are no new or different likely significant cumulative effects for socio-economics as a result of the proposed amendment acting in combination with another amendment in AP4, or in AP2, or as a result of any relevant committed development interacting with the AP4 revised scheme.

Sound, noise and vibration

Introduction

- 5.1.74 This section of the report describes the environmental baseline in relation to sound, noise and vibration that is relevant to the assessment. It then identifies any new or different likely significant environmental effects as a result of the amendment, compared to those of the SES3 scheme.

Scope, assumptions and limitations

- 5.1.75 The assessment scope, key assumptions and limitations for the sound, noise and vibration assessment 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.
- 5.1.76 Local assumptions and limitations for sound, noise and vibration are set out in main ES (Volume 2, CFA6 Report).

Existing baseline

- 5.1.77 The existing baseline sound and vibration information for this area for is described in the main ES (Volume 2, CFA6 Report: Section 11.2). Baseline sound levels representative of the assessment locations affected by the SES changes have been used in the construction and operational assessments.

Future baseline

Construction (2017)

- 5.1.78 The future baseline for construction in 2017, and construction traffic in 2021, remains unchanged from that reported in the main ES (Volume 2, CFA6 Report: Section 11.2).
- 5.1.79 SES3 and AP4 ES Volume 5: Appendix CT-004-000 provides details of the developments which are assumed to have been implemented by 2017, additional to those identified in the main ES and SES and AP2 ES.
- 5.1.80 None of the identified developments affect the assessment of the amendment's likely construction impacts on sound, noise and vibration.

Operation (2026)

- 5.1.81 The future baseline for operation in 2026 remains unchanged from that reported in the main ES (Volume 2, CFA6 Report: Section 11.2).
- 5.1.82 SES3 and AP4 ES Volume 5: Appendix CT-004-000 provides details of the developments which are assumed to have been implemented by 2026, additional to those identified in the main ES and SES and AP2 ES.
- 5.1.83 None of the identified developments affect the assessment of the amendment's likely operational impacts on sound, noise and vibration.

Effects arising during construction

- 5.1.84 The closest noise-sensitive receptors to the land required for the amendment are the remaining buildings of the pharmaceutical research facility, located to the north of the

land required for the amendment. In the main ES, no likely significant effects from construction noise were identified at these receptors.

- 5.1.85 The main ES included the construction of diaphragm walls for the Copthall retained structure. With the amendment, these works are no longer required, but works related to the cutting will take place closer to these receptors.
- 5.1.86 An assessment has been undertaken to determine whether construction noise and vibration associated with the amendment would result in a likely significant effect, using the significance criteria detailed in the main ES (Volume 5: Appendix SV-001-000).
- 5.1.87 The works associated with the amendment are predicted not to give rise to a new or different significant effect in comparison with those reported in the main ES.

Effects arising from operation

- 5.1.88 The SES and AP2 ES identified a likely significant operational combined airborne noise and ground-borne vibration effect at the pharmaceutical research facility on Breakspear Road South at Ickenham, identified as OSV6-No1 on SES and AP2 ES Map Series SV-01 and SV-02 (SES and AP2 ES Volume 5, CFA6 Map Book).
- 5.1.89 The pharmaceutical research facility is represented by assessment locations 709518 and 709519 shown on main ES, Volume 5 Map Series: SV-02 and SV-04. The amendment involves the demolition of the building where assessment location 709518 was located in the main ES. This assessment location has been moved to the closest remaining building (see SES3 and AP4 ES, Volume 2, CFA6 Map Book: Map Series SV-02). The remaining buildings are assessed as typical office buildings rather than a research facility.
- 5.1.90 An assessment has been undertaken to determine whether operational noise levels from the amendment would result in a new or different likely significant effect, using the significance criteria detailed in the main ES (Volume 5: Appendix SV-001-000).
- 5.1.91 The predicted operational vibration and operational sound levels as a result of this amendment are presented in the Table 5 and Table 6 respectively.

Table 5: Operational vibration, impacts and effects

Assessment location		Impact criteria				Significance criteria ⁷								Significant effect
		Ground-borne sound level dB LpASmax	VDV m/s ^{1.75} Daytime (07:00 – 23:00)	VDV m/s ^{1.75} Night time (23:00 – 07:00)	% increase or decrease in VDV	Number of impacts represented	Type of effect	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation effect	
ID	Area represented													
709518	Pharmaceutical research facility, Ickenham (Offices)	-	0.09	0.05	-	1	B	G ₄	T	-	-	-	-	
709519	Pharmaceutical research facility, Ickenham (Offices)	-	0.16	0.08	-	1	B	G ₄	T	-	-	-	-	

⁷ (G₁)Theatres, large auditoria and concert halls, (G₂) Sound recording and broadcast studios, (G₃) Places of meeting for religious worship, courts, cinemas, lecture theatres, museums and small auditoria or halls, (G₄) Schools, colleges, hospitals, hotels and libraries, and (G₅) Offices and general commercial premises.

Table 6: Operational airborne sound level, noise impacts and effects

Assessment Location		Impact criteria										Significance criteria								Significant effect
ID	Area represented	AP ₄ revised scheme only (Year 15 traffic)			Do nothing (Opening year baseline)			Do something (Opening year baseline + Year 15 traffic) ⁸		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing	Unique feature	Combined impact	Mitigation of effect	
		D ⁹	N ¹⁰	M ¹¹	D	N	M	D	N	D	N									
709518	Research Facility, Ickenham (Offices)	68	58	86/89	50	48	53	68	59	18	10	B	3	G5	T	-	-	-	-	OSVo6-No1
709519	Research Facility, Ickenham (Offices)	68	59	86/89	50	48	53	68	59	19	11	B	1	G5	T	-	-	-	-	OSVo6-No1

⁸ Where the AP₄ revised scheme modifies an existing source, i.e. road or railway realignments, the AP₄ revised scheme only level in the table includes the sound from the modified source. In this situation the Do something (Opening year baseline + Year 15 traffic) level has been corrected so as to not double count the sound associated with the road or railway on its new and existing alignment.

⁹ D - Day - L_{pAeq,07:00-23:00}.

¹⁰ N - Night - L_{pAeq,23:00-07:00}.

¹¹ M - Max - L_{pAFmax}. In the AP₄ revised scheme only column, two values are presented. The first is the value for the HS2 mitigated train and the second is the value for the TSI compliant train. For further information refer to Volume 5: Appendix SV-001-000.

Where the change cell is coloured red this denotes a major airborne noise impact, orange denotes a moderate airborne noise impact and yellow denotes a minor airborne noise impact.

Where the type of effect cell contains NA – this means generally no adverse effects; A - an adverse effect; S - a significant adverse effect. For further information refer to the main ES Volume 5: Appendix SV-001-000.

Where the type of receptor cell contains R – this means residential; B- is non-residential. T – is traditional building construction

- the forecast adverse effects are not considered to be significant on a community basis (further information on methodology is provided in the main ES Volume 5: Appendix SV-001-000).

Where the significant effect cell is coloured purple this denotes a significant effect has been identified.

- 5.1.92 Moving the assessment location to the closest remaining building and assessing on the basis of the building being an office, rather than a more vibration-sensitive research facility, removes the vibration impact at these commercial premises, and therefore the vibration aspect of the combined noise and vibration significant effect identified in the SES and AP₂ ES is no longer likely.
- 5.1.93 Moving the assessment location to the closest remaining building and assessing on the basis of the building being an office, reduces the airborne noise levels at this location, but not sufficiently to remove the noise impact at these commercial premises. These offices remain identified on a precautionary basis, as being subject to a significant adverse effect denoted by OSV6-No1 in Table 6 and drawing SES₃ and AP₄ ES map book SV-02. This may take the form of the disturbance of activities inside the office building.
- 5.1.94 The amendment will give rise to a different residual adverse significant effect compared to that reported in the SES and AP₂ ES. In particular, the removal of the vibration effect at the former pharmaceutical research facility offices means there is no longer a likely residual combined operational airborne noise and vibration effect.

Mitigation and residual effects

- 5.1.95 The assessment of construction noise and vibration assumes the implementation of the principles and management processes set out in the draft CoCP (Volume 5: Appendix CT-003-000).
- 5.1.96 No other mitigation measures are proposed other than those identified in the main ES (Volume 2, CFA6 Report: Section 11).
- 5.1.97 There is no change to the residual significant construction noise effects identified in the main ES as a result of this amendment.
- 5.1.98 A residual significant operational adverse noise effect is identified on a precautionary basis on the offices that remain on the pharmaceutical research facility site. This is denoted by OSV6-No1 in drawing SV-02 in the SES₃ and AP₄ ES, CFA6 Map Book. This may take the form of the disturbance of activities inside the office building.
- 5.1.99 HS₂ Ltd will continue to seek reasonably practicable measures to further reduce or avoid the adverse significant effects. In doing so, HS₂ Ltd will continue to engage with stakeholders to fully understand the receptor, its use and the benefit of the measures.

Cumulative effects

- 5.1.100 This assessment has considered the potential cumulative construction and operational noise and vibration effects of the SES₃ scheme and other committed developments.
- 5.1.101 There are no new or different likely significant cumulative effects for sound, noise and vibration as a result of the proposed amendment acting in combination with another amendment in AP₄, or in AP₂, or as a result of any relevant committed development interacting with the AP₄ revised scheme.

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

- 5.1.102 The amendment will remove the residual significant effect with regard to operational sound, noise and vibration reported in the SES and AP2 ES. In particular, the removal of the vibration effect at the pharmaceutical research facility means there is no longer a likely residual combined operational airborne noise and vibration effect.
- 5.1.103 In respect of all other environmental topics assessed, the amendment does not give rise to any new or different significant environmental effects or change the significance of the environmental effects or proposed mitigation as set out in the main ES, SES and SES3

5.2 Additional land required for the amended sustainable placement proposals in CFA6 and CFA7 and the associated diversion of footpath U50 (AP4-006-002)

- 5.2.1 The Bill provides for three areas within CFA6 and one area within CFA7 for the permanent sustainable placement of surplus excavated materials arising primarily from the construction of the Brackenbury and Cophall cuttings. One area was located to the north of Newyears Green Lane and south east of Bayhurst Wood Country Park, to the north of the route. The other two areas were located on the land between Breakspear Road South and Harvil Road to the south of the route. These two areas are divided by the existing high-pressure gas main that runs through this section of land. A fourth area was located to the south-east of South Harefield, north of the route, within CFA7 (refer to maps CT-05-019a, CT-05-019a-R1 and CT-05-019a-L1 in the main ES Volume 2, CFA6 Map Book and map CT-05-019b and CT-05-019b-R1 in the main ES Volume 2, CFA7 Map Book).
- 5.2.2 The proposed use of these sites provided for the permanent local placement of approximately one million m³ of excavated material arising from the construction of the Cophall and Brackenbury cuttings, prior to the construction of the West Ruislip railhead. A further approximately 500,000m³ of excavated material, was proposed to be temporarily stored and transported via a temporary excavated materials railhead, once construction of this was complete. The main ES scheme also included the creation of an earthwork to the north of the CML, which required the temporary storage of approximately 300,000m³ of material within the site between Harvil Road and Breakspear Road South until late in the construction programme, following removal of the West Ruislip railhead, at which point the earthwork could be constructed.
- 5.2.3 Excavation of the Cophall cutting was assumed to be completed in two stages. The first of these generated approximately one million m³ of surplus excavated material in order to facilitate construction of the West Ruislip railhead. Given the railhead was not operational during this period of excavation, this material was that assumed to be placed permanently.

- 5.2.4 Since submission of the Bill, the proposed sites identified for sustainable placement of surplus excavated material and the sustainable placement proposals within CFA6 and CFA7 have been further refined to accommodate:
- changes to the construction programme and phasing for excavation and placement;
 - modification of the permanent sustainable placement site located to the north of Newyears Green Lane, which will be split in two to avoid the existing composting facility;
 - two additional temporary material stockpiles for the storage of topsoil and subsoil, requiring additional land between the north-western edge of the permanent sustainable placement site immediately west of Breakspear Road North and the south-eastern edge of Bayhurst Wood, which will be returned to its original use at completion of construction;
 - one additional temporary material stockpile for the storage of topsoil to be located adjacent and west of the permanent sustainable placement site to the north of Newyears Green Lane which will be restored to woodland habitat;
 - modification of the permanent sustainable placement sites located to the south of the route, between Breakspear Road South and Harvil Road, to accommodate a temporary material storage site and maximise the volume of material to be placed;
 - the removal from Bill limits of the permanent placement site within CFA7 on the former Newyears Green Lane Landfill, which is designated a special site due its effect on important groundwater sources and is therefore not considered appropriate for use for sustainable placement;
 - the addition of two temporary material stockpiles in CFA7, to the west of Harvil Road and east of Uxbridge golf course, south of the existing railway corridor through the area; and
 - diversion of footpath U50 in CFA7 (see SES3 and AP4 ES, CFA7 report).
- 5.2.5 The revised and additional sustainable placement sites are shown on maps CT-05-019a-R1, CT-05-019a-L1, CT-06-019a-R1 and CT-06-019a-L1 in the SES3 and AP4 ES Volume 2, CFA6 Map Book.
- 5.2.6 The removal of the sustainable placement site from the former Newyears Green Lane Landfill and provision of a new temporary storage site to the west of Harvil Road are assessed within the SES3 and AP4 ES Volume 2 CFA7 report and are therefore not discussed further within this report.
- 5.2.7 It is proposed that the construction of the Copthall cutting be completed in three phases, allowing earlier construction of an excavated materials railhead to maximise potential opportunities for transport of material via rail.

The excavated materials railhead would subsequently be converted and extended to serve fit-out of rail systems following further excavation:

- Phase 1: excavation of the Copthall cutting in preparation for the installation of the excavated materials railhead generating approximately 550,000m³ of material, which will be permanently placed within the sustainable placement areas to the north of Newyears Green Lane;
- Phase 2: excavation for the installation of the West Ruislip tunnel logistics railhead and remaining bulk excavation of the Copthall Cutting, generating approximately 850,000m³ of excavated material. This excavated material will be managed through a combination of offsite transport via rail and temporary and permanent placement on the sustainable placement sites adjacent to Breakspear Road South, south of the route; and
- Phase 3: Copthall Cutting will further be excavated to provide space for the HS2 route and a maintenance siding generating approximately 350,000m³ of excavated material. This is assumed to be transported off site via rail.

5.2.8 Topsoils and subsoils from all the permanent sites and the temporary works to the north of the HS2 route in this CFA will be stripped and temporarily stockpiled on the adjacent temporary storage sites prior to the phases above. They will be replaced over all the permanent sites and the temporary works sites when the individual areas are completed and restored following construction.

5.2.9 The phased excavation is reliant on the provision of temporary storage capacity within the sustainable placement sites to the south of the route between Harvil Road and Breakspear Road South, prior to transport of material off site via rail, where there is sufficient capacity to do so. As such, prior to permanent placement of material, the capacity of these sites will be maximised for a period of approximately one year. The total duration of use of the temporary storage and permanent placement sites between Harvil Road and Breakspear Road South is anticipated to be three years.

5.2.10 The period of permanent deposition to the northern sustainable placement sites, prior to planting, will be approximately one year.

5.2.11 The amended sustainable placement proposals are not considered to make changes that require a reassessment of the environmental effects or proposed mitigation as set out in the main ES for: land quality, socio-economics, and traffic and transport. However there were changes where reassessment was considered to be required for: agriculture, forestry and soils, air quality, community, cultural heritage, ecology, landscape and visual assessment, sound, noise and vibration, and water resources and flood risk.

Agriculture, Forestry and Soils

Introduction

5.2.12 This section of the report describes the environmental baseline in relation to agriculture, forestry and soils that is relevant to the assessment. It then identifies any new or different likely significant environmental effects as a result of the amendment, compared to those of the SES3 scheme.

Scope, assumptions and limitations

- 5.2.13 The assessment scope, key assumptions and limitations for agriculture, forestry and soils 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.
- 5.2.14 None of the agricultural land affected by the amendment is classified as BMV. The amendment will therefore not alter the significance of effect, or result in any material different effect, on BMV agricultural land or forestry land within the CFA. The route-wide effects on BMV land and forestry land are reported in Volume 3.

Existing baseline

- 5.2.15 All the land affected by the sustainable placement site to the north of Newyears Green Lane and between Breakspear Road South and Harvil Road is on soils in the Wickham 4 association. These soils are characterised by silty clay loam topsoils overlying clay and are imperfectly to poorly drained, of Wetness Class¹² III or IV, due to their location around the water courses and flood plains. Under the local climatic conditions the typical soil profile is classified as Subgrade 3b.
- 5.2.16 Five holdings were identified in the main ES within CFA6 and one holding in CFA7 that would be affected by the amendment. These are described briefly in Table 7.

Table 7: Summary characteristics of holdings identified within the main ES

Holding reference/name	Holding type	Holding size (ha)	Diversification	Agri-environment	Sensitivity to change
CFA06/4 Cophthall Farm	Grassland	28	Not known	None	Medium
CFA06/5 Harvil Farm	Arable and Grassland	16	None	None	Medium
CFA06/6 Brackenbury Farm	Arable and Grassland	12	Not known	None	Low
CFA06/10 Rose Farm	Arable and Grassland	25	Composting	None	Medium
CFA06/11 St Leonards Farm	Arable and Grassland	12	Not known	None	Medium
CFA07/1 Park Lodge Farm	Dairy	240	None	None	High

¹² The Wetness Class of a soil is classified according to the depth and duration of waterlogging in the soil profile and has six bands.

- 5.2.17 An additional holding has been identified that will be affected by the amendment. No details have been ascertained as to the size of the holding or how it is managed. For the purposes of this assessment, the unidentified holding (possibly Pylon Farm) is assumed to extend no further than the two fields that will be affected and will be of medium sensitivity to change.

Future baseline

Construction (2017)

- 5.2.18 SES3 and AP4 ES Volume 5: Appendix CT-004-000 provides details of the developments which are assumed to have been implemented by 2017, additional to those identified in the main ES and the SES and AP2 ES.
- 5.2.19 None of the identified developments affect the assessment of the likely construction impacts of the AP4 revised scheme on agriculture, forestry and soils.
- 5.2.20 Most existing environmental stewardship agreements will expire in 2015 and will be replaced by a new environmental land management scheme (countryside stewardship) which, together with the new greening measures introduced by Common Agricultural Policy reform, will affect the detailed management of individual farm holdings. These are not expected to fundamentally change the baseline circumstances described.

Operation (2026)

- 5.2.21 SES3 and AP4 ES Volume 5: Appendix CT-004-000 provides details of the developments which are assumed to have been implemented by 2026, additional to those identified in the main ES and the SES and AP2 ES.
- 5.2.22 None of the identified developments affect the assessment of the AP4 revised scheme’s likely operational impacts on agriculture, forestry and soils.

Effects arising during construction

- 5.2.23 As far as effects on holdings are concerned, the area that was proposed to be used for sustainable placement to the north of Newyears Green Lane in the main ES would have affected Rose Farm, St Leonards Farm and Park Lodge Farm. The AP4 revised scheme will still affect these holdings along with one additional holding for which no data is available. However, the areas of land required from the various holdings have changed as described in Table 8.

Table 8: Summary characteristics of holdings – sustainable placement area north of Newyears Green Lane

Holding reference/name	Area required for main ES sustainable placement	Assessment of adverse effect	Area required for amendment sustainable placement	Assessment of effect
CFA06/10	Temporary 19.4ha	Major/moderate	Temporary 20.7ha	Major/moderate
Rose Farm	Permanent 19.4ha	Major/moderate	Permanent 18.4ha	Major/moderate
CFA06/11	Temporary 2.8ha	Major/moderate	Temporary 7.8ha	Major/moderate
St Leonards Farm	Permanent 2.8ha	Major/moderate	Permanent 5.1ha	Major/moderate

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Holding reference/name	Area required for main ES sustainable placement	Assessment of adverse effect	Area required for amendment sustainable placement	Assessment of effect
CFA07/1	Temporary 66.3ha	Major	Temporary 66.3ha	Major
Park Lodge Farm	Permanent 43.8ha	Major/moderate	Permanent 39.8ha	Major/moderate
Unidentified holding (possibly Pylon Farm)	Not affected	Not affected	Temporary 3.2ha Permanent 0.0ha	Major/moderate Negligible

5.2.24 The effects on two of the three holdings proposed to be used for sustainable placement between Breakspear Road South and Harvil Road remain as reported in the main ES but the effect on the third holding is removed, as shown in Table 9.

Table 9: Summary characteristics of holdings – sustainable placement area between Breakspear Road South and Harvil Road

Holding reference/name	Area required for main ES	Assessment of adverse effect	Area required for amendment	Assessment of effect
CFA06/4	Temporary 26.9ha	Major/moderate	Temporary 26.9ha	Major/moderate
Cophthall Farm	Permanent 26.9ha	Major/moderate	Permanent 26.9ha	Major/moderate
CFA06/5	Temporary 7.1ha	Major/moderate	Temporary 7.1ha	Major/moderate
Harvil Farm	Permanent 6.7ha	Major/moderate	Permanent 6.7ha	Major/moderate
CFA06/6	Temporary 0.5ha	Negligible	Not affected	
Brackenbury Farm	Permanent 0.5a	Negligible		

5.2.25 The majority of the land required for the sustainable placement would not be restored as agricultural land; rather it would be used for ecological mitigation (woodland and grassland habitat creation).

5.2.26 The main ES identified major/moderate significant temporary and permanent adverse effects on five holdings. The amendment to the sustainable placement will not give rise to new or different effects on these holdings. The amendment will however introduce one additional new significant temporary and permanent adverse effect on an unidentified holding (possibly Pylon Farm) that was previously unaffected by the original scheme.

5.2.27 One holding (Brackenbury Farm CFA06/6) would no longer be affected by the scheme as a result of the proposed amendment.

Effects arising from operation

5.2.28 The amendment 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 or SES.

Mitigation and residual effects

5.2.29 No mitigation measures in addition to those identified in the main ES and SES are required.

- 5.2.30 The residual effect of this amendment will result in the possible introduction of one additional significant effect for an unidentified holding (possibly Pylon Farm) but this is partially offset by the removal of a negligible effect from one holding.

Cumulative effects

- 5.2.31 Park Lodge Farm and Harvil Farm are also affected by amended sustainable placement proposals in CFA7, which involves the removal of the South Harefield sustainable placement area and the temporary use of a further area of land to the west of Harvil Road.
- 5.2.32 If the amendment is adopted, the area of agricultural land removed from Park Lodge Farm for a temporary period is reduced from 66.3ha to approximately 61.4ha and the permanent area of land required will be 33.1ha. Overall, this remains a major adverse effect but is not considered to give rise to a new or different effect for the holding.
- 5.2.33 For Harvil Farm the total area of land required by the amended sustainable placement proposals for a temporary period will be 14.9ha, which effectively represents all of the land farmed by this holding. Although the significance of effect remains unchanged (major/moderate), this amendment does give rise to a different and greater effect for Harvil Farm compared to that described in the main ES.

Air Quality

Introduction

- 5.2.34 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 amendment, compared to those of the SES3 scheme.
- 5.2.35 With regard to air quality, the main potential effects are anticipated to result from the emissions of dust from construction activities, which include site preparation works and the movement of machinery and vehicles within the sites.
- 5.2.36 Detailed reports on the air quality data and assessments for this area, as well as relevant maps, are contained within Volume 5. These include:
- SES3 and AP4 ES Appendix AQ-001-006;
 - Map AQ-01-006; and
 - Map AQ-02-006-01, Map AQ-02-006-02 and Map AQ-02-006-03.
- 5.2.37 Maps showing the location of the key environmental features can be found in the Volume 2 SES3 and AP4 ES CFA6 map books.

Scope, assumptions and limitations

- 5.2.38 The assessment scope, key assumptions and limitations and the methodology for determining the significance of effects for air quality are set out in the SMR Addendum 3 (Volume 5: Appendix CT-001 -000/4) of the SES2 and AP3 ES.
- 5.2.39 The study area for the air quality assessment has been determined on the basis of where impacts on air quality may occur from construction activities.

- 5.2.40 The assessment of the AP4 revised scheme has assumed that the general measures detailed in Section 7 of the draft CoCP (Volume 5: Appendix CT-003-000) in the main ES will be implemented.

Existing baseline

- 5.2.41 The baseline conditions with regard to air quality remain unchanged from the SES and AP2 ES and remain based upon the backgrounds maps released by Department for Environment, Food and Rural Affairs (Defra).
- 5.2.42 There is one relevant statutory designated site within CFA6 that could potentially be affected by temporary storage areas associated with the sustainable placement. This is Ruislip Woods Site of Special Scientific Interest (SSSI).

Future baseline

Construction (2017)

- 5.2.43 The future baseline for construction in 2017 remains unchanged from that reported in the main ES.
- 5.2.44 Volume 5: Appendix CT-004-000 of the SES3 and AP4 ES provides details of the developments which are assumed to have been implemented by 2017, additional to those identified in the main ES and SES and AP2 ES.
- 5.2.45 None of the identified developments affect the assessment of the amendment's likely construction impacts on air quality.

Operation (2026)

- 5.2.46 The future baseline for operation in 2026 remains unchanged from that reported in the main ES.
- 5.2.47 Volume 5: Appendix CT-004-000 of the SES3 and AP4 ES provides details of the developments which are assumed to have been implemented by 2026, additional to those identified in the main ES and SES and AP2 ES.
- 5.2.48 None of the identified developments affect the assessment of the amendment's likely operational impacts on air quality.

Effects arising during construction

- 5.2.49 The amendment is not considered to make changes to traffic flows that require reassessment of air quality impacts from construction traffic. The main ES reported no significant temporary or permanent effects on air quality during construction. The additional land required for the amended sustainable placement proposals in CFA6 and CFA7 will not give rise to any new significant effects.

Effects arising from operation

- 5.2.50 The main ES reported no significant effects on air quality during operation. The additional land required for the amended sustainable placement proposals in CFA6 and CFA7 will not give rise to any new significant effects.

Mitigation and residual effects

- 5.2.51 Emissions to the atmosphere will be controlled and managed during construction through the route-wide implementation of the CoCP.
- 5.2.52 No other mitigation measures during construction are proposed in relation to air quality.
- 5.2.53 No new or different residual effects on air quality occur as a consequence of the amendment.

Cumulative Effects

- 5.2.54 There are no new or different likely significant cumulative effects for air quality as a result of the proposed amendment acting in combination with another amendment in AP4, or in AP2, or as a result of any relevant committed development interacting with the AP4 revised scheme.

Community

Introduction

- 5.2.55 This section of the report describes the environmental baseline in relation to community that is relevant to the assessment. It then identifies any new or different likely significant environmental effects as a result of the amendment, compared to those of the SES3 scheme.

Scope, assumptions and limitations

- 5.2.56 The assessment scope, key assumptions and limitations for community 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.

Existing baseline

- 5.2.57 The baseline community information for CFA6, South Ruislip to Ickenham is described in the main ES (Volume 2, CFA6 Report, Section 5).

Future baseline

Construction (2017)

- 5.2.58 SES3 and AP4 ES Volume 5: Appendix CT-004-000 provides details of the developments which are assumed to have been implemented by 2017, additional to those identified in the main ES and the SES and AP2 ES.
- 5.2.59 None of the identified developments affect the assessment of the likely construction impacts of the AP4 revised scheme on community.

Operation (2026)

- 5.2.60 SES3 and AP4 ES Volume 5: Appendix CT-004-000 provides details of the developments which are assumed to have been implemented by 2026, additional to those identified in the main ES and the SES and AP2 ES.

- 5.2.61 None of the identified developments affect the assessment of the AP4 revised scheme's likely operational impacts on community.

Effects arising during construction

- 5.2.62 The new areas of sustainable placement do not require land that is used by community resources or residential property. The additional land requirements for the amended sustainable placement will not give rise to any new or different significant construction effects and will not change the level of significance of the effects reported in the main ES.

Effects arising from operation

- 5.2.63 No significant operation effects were reported in the main ES with regard to the sustainable placement of surplus excavated materials.
- 5.2.64 The additional land requirements for the amended sustainable placement will not give rise to any new or different significant operational effects.

Mitigation and residual effects

- 5.2.65 No avoidance and mitigation measures additional to those reported in the main ES are required.
- 5.2.66 No new or different residual effects on community occur as a consequence of the amendment. The significant residual effects of the AP4 revised scheme in this area are therefore unchanged from those reported in the main ES and SES.

Cumulative effects

- 5.2.67 There are no new or different likely significant cumulative effects for community as a result of the proposed amendment acting in combination with another amendment in AP4, or in AP2, or as a result of any relevant committed development interacting with the AP4 revised scheme.

Cultural Heritage

Introduction

- 5.2.68 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 amendment, compared to those of the SES3 scheme.

Scope, assumptions and limitations

- 5.2.69 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.

Existing baseline

- 5.2.70 The baseline cultural heritage information for CFA6, South Ruislip to Ickenham, is described in the main ES (Volume 2, CFA6 Report: Section 6). The cultural heritage baseline for the assessment takes into account information collected in support of the

main ES, which included walk-over, remote-sensing data, and from national and local registers.

- 5.2.71 In CFA6 the amended sustainable placement proposals includes two areas outside of the land required during construction identified in the main ES. These areas are located at Newyears Green and will be used for temporary material stockpile during construction and returned to their former use when construction is complete.
- 5.2.72 There is evidence of an Iron Age/early Romano-British settlement at Newyears Green (asset reference RUI 014)¹³, an asset of moderate value, located approximately 200m south-east of the new land required for the amendment, to the north of Newyears Green Lane.
- 5.2.73 The new land required for the amended sustainable placement is adjacent to Bayhurst Wood (RUI038), an area of ancient woodland and an asset of high value.
- 5.2.74 There are two medieval moated manors, Brackenbury Farm (RUI002) and Pynchester Farm (RUI001), both of which are scheduled monuments of high value. They are located approximately 180m and 380m east of the sustainable placement located between Breakspear Road South and Harvil Road to the south of the route. The area of sustainable placement is located in an agricultural landscape that provides a positive contribution to the setting of the Brackenbury Farm (RUI002) scheduled monument.
- 5.2.75 The widespread enclosure of the landscape to create the present arrangement of hedged fields and winding tracks, such as Newyears Green Lane, may have begun with the dissolution of the monasteries in the 16th century and accelerated with the introduction of new farming techniques during the 17th century. Many of the farmhouses and associated agricultural buildings in the area, such as the Grade II listed St Leonard's Farm (RUI074), an asset of moderate value, located within 100m of the Newyears Green area of sustainable placement, were built between the 17th and 19th centuries and make up the majority of the listed buildings outside the main areas of settlement of Ruislip and Ickenham.
- 5.2.76 Within the land required for sustainable placement is the site of a post medieval tile kiln (RUI023), an asset of low value, recorded on the 1st edition Ordnance Survey map.

Future baseline

Construction (2017)

- 5.2.77 SES3 and AP4 ES Volume 5: Appendix CT-004-000 provides details of the developments which are assumed to have been implemented by 2017, additional to those identified in the main ES and the SES and AP2 ES.
- 5.2.78 None of the identified developments affect the assessment of the likely construction impacts of the AP4 revised scheme on cultural heritage.

¹³ Cultural heritage assets are identified with a unique reference code, RUIXXX; further detail on these assets can be found in the gazetteer in Volume 5 of the main ES: Appendix CH-002-006.

Operation (2026)

- 5.2.79 SES3 and AP4 ES Volume 5: Appendix CT-004-000 provides details of the developments which are assumed to have been implemented by 2026, additional to those identified in the main ES and the SES and AP2 ES.
- 5.2.80 None of the identified developments affect the assessment of the AP4 revised scheme's likely operational impacts on cultural heritage.

Effects arising during construction

- 5.2.81 In the main ES, the high impact of the original scheme on archaeological assets associated with a Romano-British settlement (RUI 014), an asset of moderate value, resulted in a significant major adverse effect. The sustainable placement will still require the same area of land that affects a Romano-British settlement. As such the amendment will not give rise to a change to the high impact and the significant major adverse effect reported in the main ES.
- 5.2.82 In the main ES, the high impact of the original scheme on the site of a tile kiln at Newyears Green (RUI023), an asset of low value, resulted in a significant moderate adverse effect. The sustainable placement will still require the same area of land that affects the site of the tile kiln at Newyears Green. As such the amendment will not give rise to a change to the high impact and the significant moderate adverse effect reported in the main ES.
- 5.2.83 In the main ES, the medium impact of the original scheme on Brackenbury Farm medieval moated site, Brackenbury Farmhouse and Brackenbury House (asset reference RUI002), a grouped asset of high value, resulted in a significant major adverse effect to the setting of the asset. The sustainable placement will still require the same area of land that affected the setting of Brackenbury Farm medieval moated site, Brackenbury Farmhouse and Brackenbury House. As such the amendment will not alter the medium impact and the significant major adverse effect reported in the main ES.
- 5.2.84 In the main ES, the medium impact of the original scheme on St Leonard's Farmhouse (RUI074), an asset of moderate value, resulted in a significant moderate adverse effect to the setting of the asset. The sustainable placement will still require the same area of land that affects the setting of St Leonard's Farmhouse. As such the amendment will alter the medium impact and the significant moderate adverse effect reported in the main ES.

Effects arising from operation

- 5.2.85 No significant operational effects were reported in the main ES in regard to the sustainable placement of surplus excavated materials.
- 5.2.86 The land required for the amendment does not encroach on any additional identified heritage assets or their setting. The proposed amendment will therefore 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 or SES.

Mitigation and residual effects

- 5.2.87 No avoidance and mitigation measures additional to those reported in the main ES are required.
- 5.2.88 No new or different residual effects on cultural heritage occur as a consequence of the amendment. The significant residual effects of the AP4 revised scheme in this area are therefore unchanged from those reported in the main ES and SES.

Cumulative effects

- 5.2.89 There are no new or different likely significant cumulative effects for cultural heritage as a result of the proposed amendment acting in combination with another amendment in AP4, or in AP2, or as a result of any relevant committed development interacting with the AP4 revised scheme.

Ecology

Introduction

- 5.2.90 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 amendment, compared to those of the SES3 scheme.

Scope, assumptions and limitations

- 5.2.91 Updates to the scope of the assessment for ecology are set out in Volume 1 of the SES3 and AP4 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-001-000/01) and the SMR Addendum (Volume 5: Appendix CT-001-000/02) of the main ES.
- 5.2.92 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 AP4 revised scheme.

Existing baseline

- 5.2.93 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 between April and October 2014 and great crested newt in May 2015, and aerial photography.
- 5.2.94 A summary of the baseline information relevant to the assessment of the amendment is provided below. This takes account of any relevant 2015 survey information provided in Volume 5: SES3 and AP4 ES Appendix EC-001-001. For those receptors described in the main ES, further details are provided in Volume 2, CFA6, Section 7 of the main ES and in Volume 5, including maps EC-01 to EC-12 of the main ES.

Designated sites

5.2.95 There are no designated sites within the land required for the amendment. Bayhurst Wood which lies adjacent to the land required for the amendment is covered by two statutory and one non-statutory designations as follows:

- Bayhurst Wood is an extensive block of ancient semi-natural woodland, and along with Mad Bess, Copse and Park Woods, and Poor's Fields comprises the Ruislip Woods Site of SSSI and National Nature Reserve (NNR), and includes an extensive area of ancient semi-natural woodland, with areas of wetland vegetation, acid and neutral grassland and open heath. The SSSI and NNR (of which Bayhurst Wood is a part) are of national value; and
- Bayhurst Wood is part of Ruislip Woods and Poor's Field Site of Metropolitan Importance, along with Mad Bess, Copse and Park Woods, Poor's Fields and Ruislip Lido (a large body of open water) which is of county/metropolitan value.

Habitats

Woodland

5.2.96 Bayhurst Wood is the only woodland relevant to the assessment, and is adjacent to the land required for the amendment. It is ancient woodland, comprising largely of oaks and hornbeam, and is of national value as reported in the main ES.

Hedgerows

5.2.97 Hedgerows in the fields south-east of Bayhurst Wood and closer to the southernmost part of Bayhurst Wood are located in and adjacent to the additional land required for the amended sustainable placement proposals. These hedgerows may qualify as 'Important' under the landscape and wildlife criteria in the Hedgerows Regulations¹⁴ and include standard trees. The hedgerows are of district/borough value as reported in the main ES.

Grassland

5.2.98 The majority of grassland across the land required for the amended sustainable placement proposals is agricultural and comprises improved grassland with fields of semi-improved neutral grassland to the south of Bayhurst Wood. This grassland is of local/parish value as reported in the main ES.

Waterbodies

5.2.99 There are four ponds in the land required for the amended sustainable placement. Ponds supporting great crested newts are a habitat of principal importance. These four ponds are of district/borough value on the basis of an assumed population of great crested newt as reported in the main ES.

¹⁴ The Hedgerows Regulations 1997 (1997 No. 1160). London. Her Majesty's Stationery Office.

Protected and/or notable species

- 5.2.100 Fields south of Bayhurst Wood are identified in the main ES as medium value for foraging barn owl (see Table 11 in Paragraph 7.3.23 of the main ES) and are in the land required for the amended sustainable placement proposals. If barn owls breed in this area, this population would be of county/metropolitan value as reported in the main ES.
- 5.2.101 Bat activity transect and static detector surveys carried out around the fields to the south and south-east of Bayhurst Wood in 2014 recorded regular low levels of activity from common and soprano pipistrelle and occasional passes of rarer species including noctule, *Myotis* species, Nathusius' pipistrelle, Leisler's, and serotine. It is therefore possible that roosts of rarer species could be present in the land required for the amended sustainable placement proposals. As the presence of maternity colonies of rarer species cannot be ruled out, a precautionary value of up to regional value applies as reported in the main ES.
- 5.2.102 Bayhurst Wood and adjoining hedgerows which extend into the land required for the amendment are suitable habitat for dormouse. A precautionary value of up to county/metropolitan applies as reported in the main ES.
- 5.2.103 Four ponds located in the land required for the amendment and together with 13 additional ponds in the local area form the assumed 'Ponds east and south of Bayhurst Wood' medium metapopulation of great crested newts (CFA6-AMP3 – Volume 5: EC-001-001 of the main ES). Two of these ponds located within 250m of the land required for the amendment were subject to eDNA¹⁵ surveys in 2015, and negative results were returned. However, as it has not been possible to confirm the absence of great crested newts in all ponds supporting the assumed metapopulation, great crested newts are still assumed to be present in the land required for the amendment. A precautionary value of up to county/metropolitan applies as reported in the main ES.
- 5.2.104 Hedgerows to the south of Bayhurst Wood in the land required for the amended sustainable placement proposals are assumed to support a terrestrial invertebrate assemblage. A precautionary value of up to county/metropolitan applies, as reported in the main ES.
- 5.2.105 Protected and notable plants are assumed to be present in hedgerows and ponds to the south of Bayhurst Wood. A precautionary value of up to county/metropolitan applies, as reported in the main ES.
- 5.2.106 Populations of common reptiles are assumed to be present in fields south and east of Bayhurst Wood. A precautionary value of up to district/borough applies, as reported in the main ES.
- 5.2.107 Signs of badger activity were noted during field surveys in the wider area undertaken for the main ES. These may form part of the territory of badger populations in the adjacent Colne Valley area. If present badger social groups in the land required for the

¹⁵ Environmental DNA is that which is released into the water by plants and animals in a host of ways: from their skin, faeces, mucus, hair, eggs and sperm, or when they die. It provides a means to undertake a diagnostic test to determine the presence or likely absence of a specific target species.

amendment are not likely to form a critical part of the county or district population. Badgers are considered to be of local/parish value as reported in the main ES.

Future baseline

Construction (2017)

- 5.2.108 SES2 and AP4 ES Volume 5: Appendix CT-004-004 provides details of the developments which are assumed to have been implemented by 2017, additional to those identified in the main ES and the SES and AP2 ES.
- 5.2.109 None of the identified developments affect the assessment of the amendment's likely construction impacts on ecology.

Operation (2026)

- 5.2.110 SES2 and AP4 ES Volume 5: Appendix CT-004-004 provides details of the developments which are assumed to have been implemented by 2026, additional to those identified in the main ES and the SES and AP2 ES.
- 5.2.111 None of the identified developments affect the assessment of the amendment's likely operational impacts on ecology.

Effects arising during construction

Avoidance and mitigation measures

- 5.2.112 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. The design also incorporates a 25m buffer between the storage mounds which are part of the sustainable placement area and Bayhurst Wood which is part of the Ruislip Woods SSSI. These buffers will not be used by construction traffic.

Designated sites

- 5.2.113 In the main ES, no effects were reported on Ruislip Woods SSSI where works for the original scheme were 100m from the woodland edge. The amended temporary storage sites will be 25m from the woodland edge, and the buffer will not be used by construction traffic. The use of this buffer and the measures outlined in the CoCP to dampen dust and avoid significant deposition of dust within the woodland. Any effects will only be temporary and the integrity of the SSSI will not be affected by the works. The amendment will, therefore, 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.

Habitats

- 5.2.114 The main ES reported that collective losses of grassland in the local area, including the loss of 25ha in fields southeast of Bayhurst Wood for the use of the sustainable placement area, would result in a significant effect at the district/borough level. The land required for the amended sustainable placement proposals will result in the temporary loss of an additional approximately 10 ha of improved and semi-improved neutral grassland, almost equal amounts of each, giving a total loss of 35 ha of

grassland. This will not change the level of significance of the effects reported in the main ES.

- 5.2.115 The main ES reported that the loss of three ponds for the use of the sustainable placement area, would have an adverse effect on a medium population of great crested newts which was significant at the county/metropolitan level. The land required for the amended sustainable placement proposals will now result in the loss of four ponds (two north of St Leonards Farm, one south of Bayhurst Wood and one near Oak Cottage). The proposed amendment will give rise to a different significant effect, although it will not change the level of significance of the effects reported in the main ES.
- 5.2.116 The main ES reported that the loss of approximately 3.6km of hedgerows for the use of the sustainable placement area would result in an adverse effect, significant at the district/borough level. The land required for the amended sustainable placement proposals will result in the loss of approximately 4.5km hedgerows, an increase of approximately 1km. The majority of these additional hedgerows are not intact and are unlikely to be classified as important hedgerows under the Hedgerow Regulations. Therefore, the proposed amendment will give rise to a different significant effect, but will not change the level of significance of the effect reported in the main ES.

Protected and/or notable species

- 5.2.117 The main ES reported that the loss of assumed protected and notable plant species for the use of the sustainable placement area would result in a significant at the local/parish level. The land required for the amended sustainable placement proposals will result in the additional loss of isolated areas of habitat which are assumed also to support protected and notable plant species. However, the level of significance reported in the main ES will not change.
- 5.2.118 The sustainable placement area use will result in the loss of possible roosts of common and rarer bat species, along with the loss of foraging areas and commuting routes used by common pipistrelle species and some rarer species. The main ES reported that the effect on these populations was significant at up to the county/metropolitan level. The land required for the amended sustainable placement proposals will result in the additional loss of approximately 1km of hedgerow and associated trees which on a precautionary basis could support roosts of rarer species. Whilst it is likely that bats will continue to forage in Bayhurst Wood to the north and in retained farmland to the north-east and south of the amendment, some commuting disruption remains likely. The proposed amendment will therefore give rise to different significant effects, but they will not change the level of significance of the effects reported in the main ES on roosting rare and common bat species, and foraging and commuting common pipistrelle and some rarer bat species.
- 5.2.119 The main ES reported that the loss of three ponds and approximately 20ha of terrestrial habitat for an assumed medium metapopulation of great crested newt in ponds south of Bayhurst Wood for the use of the sustainable placement area was significant at up to the county/metropolitan level. The land required for the amendment will now result in the total loss of four ponds and approximately 25ha of suitable terrestrial habitat (i.e. the area within a 250m radius of the ponds the majority of which includes poor quality habitat such as improved agricultural grassland). The

proposed amendment will give rise to a different significant effect but it will not change the level of significance of the effects reported in the main ES.

- 5.2.120 The main ES reported that the loss of hedgerows south of Bayhurst Wood that may support hazel dormouse and terrestrial invertebrates, would result in effects on both of these receptors significant at the county/metropolitan level. The land required for the amendment will result in the additional loss of 1km of hedgerows in this area. The majority of those lost for the amendment are not intact, and their loss will not change the level of significance of the effects reported in the main ES.
- 5.2.121 The main ES reported that the loss of one barn owl territory for the use of the sustainable placement area was significant at up to the county/metropolitan level. The amendment will result in the loss of additional fields and hedgerows. The proposed amendment 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.

Cumulative effects

- 5.2.122 There are no new or different likely significant cumulative effects for ecology as a result of the proposed amendment acting in combination with another amendment in AP4, or in AP2, or as a result of any relevant committed development interacting with the AP4 revised scheme.

Mitigation and residual effects

Other mitigation measures

- 5.2.123 The main ES reported the restoration and enhancement of approximately 30ha of habitat to the south and southeast of Bayhurst Wood. Whilst the habitat to be lost in this area is predominantly improved grassland, with some semi-improved grassland, hedgerows and three ponds, the habitat to be created on restoration that was reported in the main ES was native broadleaved woodland with semi-improved grassland, native hedgerows and ponds (see main ES: Volume 2, CFA6, Section 7). This was to enhance the area for a range of fauna species, and increase woodland in the area and its connectivity with Bayhurst Wood, which is ancient woodland. The main change as part of the amendment is the inclusion of two additional areas of temporary storage close to Bayhurst Wood, the majority of which is improved grassland, and both of which will be restored back to original use. There are only some minor changes in the areas of permanent sustainable placement areas compared with that described in the main ES. There is no change in woodland provision and a reduction in grassland creation of 2ha compared with the main ES. Of this, 1ha will no longer be affected by construction and therefore mitigation for this will not be required. The amendment will reduce the creation of grassland managed for conservation by 1ha. The general provision of mitigation will therefore, remain largely unchanged for the amended AP4 scheme. Given there are no additional adverse significant effects reported for the AP4 scheme it is considered that this mitigation will reduce reported impacts to a level which is not significant.
- 5.2.124 A summary of the relevant mitigation measures for species are included below:
- The loss of four ponds will be mitigated in line with the Ecology technical note: Ecological principles of mitigation (Volume 5: Appendix CT-001-000/2) of the

main ES;

- The loss of habitat for barn owl will be mitigated through the measures described in the main ES: Volume 2, CFA6, Section 7; and
- The loss of roost sites for bats, foraging and commuting habitat for bats, habitat for dormouse, habitat for terrestrial invertebrates and habitat for reptiles would be mitigated as described in the main ES: Volume 2, CFA6, Section 7.

5.2.125 Following the implementation of these measures it is anticipated that any adverse impacts on protected and/or notable species from the amendment will be reduced to a level that is not significant.

Summary of likely residual effects

5.2.126 No new or different significant residual effects on ecological receptors occur as a consequence of the amendment and the mitigation measures detailed in the main ES still apply. The significant residual effects of the AP4 revised scheme in this area are therefore unchanged from those reported in the main ES and SES.

Effects arising from operation

5.2.127 The proposed amendment will not give rise to new or different operational significant effects on designated sites, habitats or species and will not change the level of significance of the effects reported in the main ES and SES.

Landscape and visual assessment

Introduction

5.2.128 This section of the report describes the environmental baseline that is relevant to the landscape and visual assessment. It then identifies any new or different likely significant environmental effects as a result of the amendment, compared to those of the SES3 scheme.

Scope, assumptions and limitations

5.2.129 The assessment scope, key assumptions and limitations for landscape and visual 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. An update to the methodology for the landscape and visual assessment is also described in Volume 1 of the AP1 ES.

Existing baseline

5.2.130 The area of land required for the amendment is located within Harefield Farmland LCA as described in the main ES (Volume 2, CFA6 Report: Section 9).

5.2.131 The following viewpoints are located in close proximity and are described in the main ES (Volume 2, CFA6 Report: Section 9):

- Viewpoint 048.2.007: view west and south-west from Rose Farm House and a PRoW (footpath U38) connecting Breakspear Road South with Newyears Green Lane; and

- Viewpoint 050.2.004: view west and north-west from four dwellings on Newyears Green Lane and from two PRoW (footpaths U36 and U37) connecting Bayhurst Wood with Newyears Green Lane.

5.2.132 The following viewpoints will not be affected by the amendment and are not considered further due to the small changes in the view resulting from the amendment viewed in the context of the large elements of the original scheme or being screened by the intervening existing mature vegetation:

- Viewpoint 047.2.004: view west from dwellings on Breakspear Road South and Swakeleys Road (close to junction with Harvil Road); A representative photomontage from dwellings on Breakspear Road South and Swakeleys Road is included in the SES3 and AP4 ES, Volume 2, CFA6 Map Book: LV-01-293. It should be noted that the photomontage is representative of the possible views assessed under Viewpoint 047.2.004, but is in a slightly different location.
- Viewpoint 047.2.005: view north and north-west from Brackenbury House, Farm and associated properties off Breakspear Road South, Ickenham;
- Viewpoint 047.2.006: view west from residential properties on Breakspear Road South;
- Viewpoint 049.3.006: view east from the PRoW (footpath U49) between Harvil Road and Breakspear Road South, to the south of the CML;
- Viewpoint 050.2.003: view north from St Leonard's Farm, Pylon Farm, Highview Farm, Elm Tree Farm and Waste Transfer Station Views (100m);
- Viewpoint 050.2.006: view south from Willow Tree Farm and Willow Tree Camp and Training Centre Views (220m); and
- Viewpoint 050.3.007: view south-east from Bayhurst Wood Country Park and from Hillingdon Trail (footpath U86) Views (350m).

Future baseline

Construction (2017)

5.2.133 SES3 and AP4 ES Volume 5: Appendix CT-004-000 provides details of the developments which are assumed to have been implemented by 2017, additional to those identified in the main ES and SES and AP2 ES.

5.2.134 None of the identified developments affect the assessment of the amendment's likely construction impacts on landscape and visual resources.

Operation (2026)

5.2.135 SES3 and AP4 ES Volume 5: Appendix CT-004-000 provides details of the developments which are assumed to have been implemented by 2026, additional to those identified in the main ES and SES and AP2 ES.

5.2.136 None of the identified developments affect the assessment of the amendment's likely operational impacts on landscape and visual resources.

Effects arising during construction

Landscape assessment

- 5.2.137 The Harefield Farmland LCA was assessed as being affected by the original scheme and also will be affected by this amendment. The overall landscape condition is fair and the LCA is bordered by roads which reduce tranquillity locally, but overall the tranquillity of this character area is considered to be medium. The area is valued at a regional level as a result of its location within the green belt. Therefore, this area is therefore considered to be of high sensitivity to change.
- 5.2.138 The main ES reported a major adverse effect during construction due to the scale of the works within the LCA, presence of the main construction compound to the south of the existing railway corridor, presence of sustainable placement sites, demolition of buildings, and removal of existing vegetation.
- 5.2.139 Overall the amendment will be similar in scale and extent to the original scheme. Therefore the amendment will not give rise to a new or different significant effect on Harefield Farmland LCA and will not change the level of significance of the effect reported in the main ES.

Visual assessment

- 5.2.140 The following two viewpoints were assessed as being affected by the original scheme and will also be affected by the amendment:
- a moderate adverse effect during construction on Viewpoint 048.2.007: view west and south-west from Rose Farm House and PRoW (footpath U38) connecting Breakspear Road South with Newyears Green Lane due to filtered views of the large scale earth moving plant close to residential property. The amendment will bring the footprint of the proposed sustainable placement closer to the western boundary of Rose Farm House, but the level of activity will be similar to that of the original scheme. The proposed amendment will not give rise to a new or different significant visual effect and will not change the level of significance of the effects reported in the main ES; and
 - a moderate adverse effect during construction on Viewpoint 050.2.004: view west and north-west from four dwellings on Newyears Green Lane and from two PRoW (footpaths U36 and U37) connecting Bayhurst Wood with Newyears Green Lane due to the close proximity of the activities associated with the sustainable placement area, accentuated by the removal of existing hedgerows and trees. The amendment will bring the footprint of the sustainable placement area slightly closer to the properties and will require the removal of some additional hedgerow vegetation thereby opening up views. However, the proposed amendment will not give rise to a new or different significant visual effect and will not change the level of significance of the effects reported in the main ES.

Effects arising from operation

Landscape assessment

- 5.2.141 The Harefield Farmland LCA was assessed as being affected by the original scheme and will be also affected by this amendment. The Harefield Farmland LCA is considered to be of high sensitivity to change. The main ES reported a moderate adverse effect during year one of operation due to the presence of new infrastructure and engineered landforms at the retained cutting north of the CML, the introduction of a new landform created from sustainable placement and the loss of mature hedgerows and the original field patterns. Planting established as part of the original scheme will, when mature, integrate the scheme into the landscape and reduce effects to non-significant by year 15 and on to year 60.
- 5.2.142 The amendment will be largely within the footprint of the original scheme. However, for the sites located between Newyears Green Lane and Bayhurst Wood Country Park the footprint of the sustainable placement area will be extended to the north, into the areas of arable fields and pastures, between the wooded areas but still bounded by Bayhurst Wood Country Park. The overall height and extent of the sustainable placement areas will be similar in scale and extent to the original scheme. Therefore the amendment will not give rise to a new or different significant effect on Harefield Farmland LCA and will not change the level of significance of the effect reported in the main ES.

Visual assessment

- 5.2.143 The slight change in footprint of the sustainable placement sites to the north of Newyears Green Lane will move the footprint closer to the receptors in four dwellings on Newyears Green Lane and further away from Leonard's Farm, Pylon Farm, Highview Farm and Elm Tree Farm. However, the footprint of the sustainable placement sites to the north will be brought closer to receptors in Bayhurst Wood Country Park. Views of the surplus excavated material will be filtered and screened by the existing mature trees of the Country Park.
- 5.2.144 Two viewpoints were assessed in the main ES (Volume2, CFA6 Report: Section 9) as being affected by the original scheme and will be further affected by the AP4 revised scheme.
- 5.2.145 The main ES reported a moderate adverse effect in year one of operation on Viewpoint 048.2.007: view west and south-west from Rose Farm House and PRoW (footpath U38) connecting Breakspear Road South with Newyears Green Lane due to the presence of the 3m high sustainable placement area in filtered views from Rose Farm House and elevated views from the PRoW across the surrounding countryside (emphasised by the immaturity of the replacement hedgerows and woodland planting). By year 15 and beyond to year 60 of operation, planting established as part of the original scheme will have matured, providing additional screening reducing the effects to minor adverse. A representative photomontage from Rose Farm House is included in the SES3 and AP4 ES, Volume 2, CFA6 Map Book: LV-01-294. It should be noted that the photomontage is representative of the possible views assessed under Viewpoint 048.2.007 but is in a slightly different location.

- 5.2.146 The amendment will bring the footprint of the proposed sustainable placement slightly closer to the western boundary of Rose Farm House but the scale of the landform will be similar to the original scheme. The amendment will not give rise to a new or different significant visual effect and will not change the level of significance of the effects reported in the main ES by year 1, year 15 and beyond to year 60.
- 5.2.147 The main ES reported a moderate adverse effect in year one of operation on Viewpoint 050.2.004: view west and north-west from four dwellings on Newyears Green Lane and from two PRow (footpaths U36 and U37) connecting Bayhurst Wood with Newyears Green Lane due to the presence of open views of the sustainable placement areas accentuated by the removal of existing hedgerows and trees. The effects were reported in the main ES to reduce to minor adverse in year 15 as the replacement planting matures and remains at this level at year 60.
- 5.2.148 The amendment would take the footprint of the sustainable placement area slightly further from the properties and retain some hedgerow vegetation, but the scale of the landform will be similar to the original scheme. The proposed mitigation planting remains as set out in the main ES. The amendment will not give rise to a new or different significant visual effect and will not change the level of significance of the effects reported in the main ES by year 1, year 15 and beyond to year 60.

Mitigation and residual effects

- 5.2.149 No mitigation measures in addition to those identified in the main ES and SES are required.
- 5.2.150 No new or different residual effects on landscape and visual occur as a consequence of the amendment. The significant residual effects of the AP4 revised scheme in this area are therefore unchanged from those reported in the main ES and SES.

Cumulative effects

- 5.2.151 There are no new or different likely significant cumulative effects for landscape or visual as a result of the proposed amendment acting in combination with another amendment in AP4, or in AP2, as a result of any relevant committed development interacting with the AP4 revised scheme.

Sound, noise and vibration

Introduction

- 5.2.152 This section of the report describes the environmental baseline in relation to sound, noise and vibration that is relevant to the assessment. It then identifies any new or different likely significant environmental effects as a result of the amendment, compared to those of the SES3 scheme, taking into account any amendments from previous SES and AP2 ES reports that are relevant to the assessment.

Scope, assumptions and limitations

- 5.2.153 The assessment scope, key assumptions and limitations for sound, noise and vibration 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.

- 5.2.154 Local assumptions and limitations for sound, noise and vibration are set out in main ES Volume 2, CFA6 Report: Section 11.

Existing baseline

- 5.2.155 The baseline sound, noise and vibration information for CFA6, South Ruislip to Ickenham, is described in the main ES (Volume 2, CFA6 Report: Section 11). Baseline sound levels representative of the assessment locations affected by this amendment have been used in the construction sound, noise and vibration assessments.

Future baseline

Construction (2017)

- 5.2.156 SES3 and AP4 ES Volume 5: Appendix CT-004-000 provides details of the developments which are assumed to have been implemented by 2017, additional to those identified in the main ES and the SES and AP2 ES.
- 5.2.157 None of the identified developments affect the assessment of the AP4 revised scheme's likely construction noise and vibration impacts.

Operation (2026)

- 5.2.158 SES3 and AP4 ES Volume 5: Appendix CT-004-000 provides details of the developments which are assumed to have been implemented by 2026, additional to those identified in the main ES and the SES and AP2 ES.
- 5.2.159 None of the identified developments affect the assessment of the AP4 revised scheme's likely operational noise and vibration impacts.

Effects arising during construction

- 5.2.160 The closest noise-sensitive receptors to the amended sustainable placement area located to the north of Newyears Green Lane are the residential properties on Newyears Green Lane, located to the south of the amendment (see main ES, Volume 5, Sound, noise and vibration map book, SV-03 maps: assessment locations 408586 and 420281). No likely significant effects from construction noise were identified in the main ES at these receptors.
- 5.2.161 The amendment will involve additional works related to temporary topsoil and subsoil storage at additional areas to the north of the permanent placement areas at Newyears Green Lane.
- 5.2.162 An assessment has been undertaken to determine whether construction noise and vibration associated with the amendment would result in a likely significant effect, using the significance criteria detailed in the main ES (Volume 5: Appendix SV-001-000).
- 5.2.163 The works associated with the amendment are not predicted to lead to a change in noise levels at the sensitive receptors sufficient to give rise to new or different significant effects from those reported in the main ES.

Effects arising during operation

- 5.2.164 As the amendment is during the construction phase only, the amendment will not give rise to a new or different significant operational noise or vibration effect in comparison with those reported in the main ES.

Mitigation and residual effects

- 5.2.165 The assessment of construction noise and vibration assumes the implementation of the principles and management processes set out in the draft CoCP (main ES Volume 5: Appendix CT-003-000).
- 5.2.166 No mitigation measures in addition to those identified in the main ES and SES are required.
- 5.2.167 No new or different residual effects on sound, noise and vibration occur as a consequence of the amendment. The significant residual effects of the AP₄ revised scheme in this area are therefore unchanged from those reported in the main ES and SES.

Cumulative effects

- 5.2.168 This assessment has considered the potential cumulative construction noise effects of the scheme and other committed developments.
- 5.2.169 There are no new or different likely significant cumulative effects for sound, noise and vibration as a result of the proposed amendment acting in combination with another amendment in AP₄, or in AP₂, or as a result of any relevant committed development interacting with the AP₄ revised scheme.

Water Resources and Flood Risk

Introduction

- 5.2.170 This section of the report describes the environmental baseline in relation to water resources and flood risk that is relevant to the assessment. It then identifies any new or different likely significant environmental effects as a result of the amendment, compared to those of the SES₃ scheme.

Scope, assumptions and limitations

- 5.2.171 The assessment scope, key assumptions and limitations for water resources and flood risk 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.
- 5.2.172 The assessment reviews the potential impact of the proposed amendment on the groundwater, surface water and flood risk. Specific hydraulic modelling has not been undertaken within the study area for any source of flood risk, as there are no surface water features in the vicinity of the amendment.

Existing baseline

- 5.2.173 The baseline water resources and flood risk information for CFA6, South Ruislip to Ickenham is described in the main ES (Volume 2, CFA6 Report, Section 13).

5.2.174 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, CFA6, Section 13.3 and in Volume 5.

5.2.175 Table 10 includes features potentially affected by the amendment.

Table 10: Surface water features potentially affected by the amendment

Water feature	Location description (and map reference as set out in Main ES)	Watercourse classification ¹⁶	Water Framework Directive (WFD) water body and current overall status	WFD status objective (by 2027* as per River Basin Management Plan (RBMP))	Receptor value ¹⁷
River Pinn	West of Ruislip Golf Course. (SWC-CFA6-02)	Main river	Pinn GB106039023070 Moderate	Good potential	High
Nine ponds ¹⁸ , generally very small and isolated in fields	Individual ponds located west of Newyears Green north around to St Leonards Farm, the largest is associated with drainage from an industrial composting site. (CFA06-P06)	Not applicable	Not applicable	Not applicable	Low
Newyears Green Bourne	North-west of Newyears Green Covert. (SWC-CFA6-10)	Main river	No status class shown in RBMP – assumed status Poor	No status class shown in RBMP – assumed status Good potential	Moderate
The Mad Bess Brook	South of Mad Bess Wood.	Main river	No status class shown in RBMP – assumed status (based on Pinn GB106039023070) Moderate	No status class shown in RBMP – assumed status Good potential	High

* year may vary in different RBMPs

5.2.176 The assessment has taken account of changes in relevant legislation published since the main ES was produced, such as the Water Act 2014 and the Environmental Permitting (England and Wales) Regulations amendment 2014.

¹⁶ Water-feature classifications: Section 113 of the Water Resources Act 1991 defines a main river as a watercourse that is shown as such on a main river map. Section 72 of the Land Drainage Act 1991 defines an ordinary watercourse as 'a watercourse that is not part of a main river'. Section 221 of the Water Resources Act 1991 defines a watercourse as including 'all rivers and streams, ditches, drains, cuts, culverts, dikes, sluices, sewers (other than public sewers) and passages through which water flows'. Main rivers are larger rivers and streams designated by Defra on the main river map and are regulated by the Environment Agency.

¹⁷ For examples of receptor value see Table 43 in the SMR Addendum (see Volume 5, Appendix CT-001-000/2).

¹⁸ Note that this differs from the number of ponds reported in the ecology section, due to differences in assessment methodology. Water resources considers waterbodies within 1 km while ecology only considers bodies within 250m.

- 5.2.177 The principal geology underlying the site, as mapped by the British Geological Survey, is the Thames Group (part of the London Clay Formation), with smaller amounts of the Lambeth Group (Woolwich and Reading Formations). Superficial deposits are absent across the majority of the site area, although there are small amounts of Black Park Gravel to the south of the route.
- 5.2.178 The Thames Group is classified as Unproductive strata. The Lambeth Group is classified as Unproductive strata at the top of the formation, and a Secondary A aquifer towards the base. The Black Park Gravel deposits are part of the Thames Valley Formation and also classified as a Secondary A aquifer. Further details regarding the geology can be found in Volume 2, Appendix WR-002-006 of the main ES.
- 5.2.179 The Environment Agency reports that there is one public water supply (PWS) abstraction (TH174) with a Source Protection Zone (SPZ) in this area (see Map WR-02-006, Volume 5, Water Resources and Flood Risk Assessment Map Book of the main ES). The additional land required by the amendment falls within the SPZ 1 and SPZ 2 for this abstraction.
- 5.2.180 There are no private licensed groundwater abstractions within 1km of AP-006-002. There is the potential for unlicensed abstractions to exist, as a licence is not required for abstraction volumes below 20m³ per day.
- 5.2.181 There are no licensed surface water abstractions within 1km of AP-006-002. There is the potential for unlicensed abstractions to exist, as a licence is not required for abstraction volumes below 20m³ per day.
- 5.2.182 There are two discharges to surface water and three discharges to groundwater within 1km of AP-006-002. Details are provided in the main ES, Volume 5, Appendix WR-02-006.
- 5.2.183 The areas proposed for sustainable placement within the AP4 revised scheme are located in two main areas. To the north of the route, temporary and permanent placement areas are located between Newyears Green Lane and Bayhurst Wood on a watershed between the River Pinn and Newyears Green Bourne catchments. There are dry valleys in the River Pinn catchment flowing in an easterly direction, crossing through the centre of the most northerly temporary topsoil storage area and the most easterly permanent placement area. A dry valley within the Newyears Green Bourne catchment crosses the north-western corner of the temporary subsoil storage area located immediately to the north of the composting facility, sloping in a south-westerly direction. All three dry valleys have areas of associated surface water flood risk as shown on the Environment Agency updated Flood Map for Surface Water (uFMfSW). The permanent placement area to the north of Newyears Green Lane has been reduced in size in the AP4 revised scheme relative to the original scheme. The two temporary placement sites for topsoil and subsoil are new relative to the original scheme.
- 5.2.184 To the south of the route, the two sites that are to be split to temporarily accommodate topsoil storage are located between Breakspear Road South and Harvil Road, to the west of Ickenham. Both are crossed by dry valleys sloping east towards the River Pinn, with associated areas of surface water flood risk as shown on the uFMfSW. There are no changes to the outlines of these sites in the AP4 revised

scheme relative to the original scheme. The permanent placement site to the west of Harvil Road is located within CFA7.

- 5.2.185 Receptors that have the potential to be affected by the revised scheme include residential properties (high value receptors) on Breakspear Road South, Greenacres Avenue, St. Georges Drive, Kenbury Close and Derwent Avenue. All of these properties are at risk of flooding in the 1 in 30 year return period (3.3% annual probability) rainfall event immediately downstream of the sustainable placement areas that are located to the south of the route.
- 5.2.186 None of the proposed sustainable placement areas are located within areas at significant risk of flooding from rivers, groundwater, reservoirs, sewers or other artificial waterbodies.

Future baseline

Construction (2017)

- 5.2.187 SES3 and AP4 ES Volume 5: Appendix CT-004-000 provides details of the developments which are assumed to have been implemented by 2017, additional to those identified in the main ES and the SES and AP2 ES.
- 5.2.188 None of the identified developments affect the assessment of the AP4 revised scheme's likely construction impacts on water resources and flood risk.
- 5.2.189 Information on the potential additional impacts of climate change for water resources and flood risk is provided in the main ES, Volume 5 Appendix WR-003-006, and Sections 7 and 8 of Volume 1 and Table 13 of Volume 5: Appendix CT-009-000.

Operation (2026)

- 5.2.190 SES3 and AP4 ES Volume 5: Appendix CT-004-000 provides details of the developments which are assumed to have been implemented by 2026, additional to those identified in the main ES and the SES and AP2 ES.
- 5.2.191 None of the identified developments affect the assessment of the AP4 revised scheme's likely operational impacts on water resources and flood risk.
- 5.2.192 Current projections to the 2080s indicate that climate change may affect the future baseline against which the impacts of the AP4 revised scheme on surface water and groundwater resources have been assessed. There may be changes in the flow and water quality characteristics of surface water and groundwater bodies as a result of changes in climate. However, these changes are not considered to result in changes to the level of significance of the effects reported in the main ES.
- 5.2.193 Further information on the potential additional impacts of climate change for water resources and flood risk is provided in Sections 7 and 8 of Volume 1 and Table 13 of Volume 5: Appendix CT-009-000 of the main ES.

Effects arising during construction

- 5.2.194 The revised sustainable placement location has excluded the area of an existing landfill site located in CFA7, which is designated contaminated land and is therefore

not appropriate for use for sustainable placement. This will reduce the potential risks of contamination of the water environment in this area.

- 5.2.195 The revised scheme includes an area for sustainable placement to the north of Newyears Green Lane. In this area there are numerous ponds (Volume 5 Water Resources and Flood Risk Map Book WR-01-007 CFA06) that are within the land required for construction of the scheme. Ecological mitigation ponds will replace those lost, as discussed in the ecology section of this assessment.
- 5.2.196 With regard to surface water, Section 16 of the draft CoCP stipulates that works in or near the watercourses will be designed in consultation with the Environment Agency so that sediment mobilisation is managed, the potential for contamination from fuel spills is minimised and the works are timed to minimise the impact on water quality and water dependent habitats and species.
- 5.2.197 These sustainable placement areas are located in SPZ1 and SPZ2 of the TH174 abstraction; however, groundwater contamination within the SPZ from surface infiltration through the excavated materials or spills will be minimal since the deposition areas are underlain by London Clay Formation or Lambeth Group strata. The draft CoCP and best practice during construction will protect against potential pollution during construction. Specific monitoring to determine the potential impact to PWS will be undertaken as discussed in the main ES, Volume 2, CFA6 Report, Section 13.
- 5.2.198 Since the sustainable placement works will now be undertaken in three phases, rather than two, mitigation measures may need to be undertaken at an earlier stage than originally anticipated.
- 5.2.199 New temporary topsoil and subsoil storage areas located to the north of the permanent sustainable placement areas on additional land required north of Newyears Green Lane are located within areas at risk of surface water flooding. The draft CoCP sets out the measures and standards of work that will be applied to the construction of the AP4 revised scheme. It would provide effective management and control of the impacts during the construction period including those required for groundworks. In accordance with Section 16 of the draft CoCP, excavated material storage will be located outside of areas at risk of flooding where practicable to avoid having an impact on the risk of flooding elsewhere. Where this is not possible, there will be a site specific flood risk management plan prepared prior to construction to manage the potential risks such that there will be no impact on the risk of flooding for vulnerable receptors.
- 5.2.200 The sustainable placement will alter slopes and landforms, which could result in increased rates of surface water runoff to the areas of surface water flood risk downstream. Land drainage will be incorporated as necessary to intercept and attenuate overland flows to be discharged at existing locations at existing rates. As such there will be no impact on the risk of flooding to the high value receptors downstream as a result of the revised sustainable placement areas that form the AP4 revised scheme.
- 5.2.201 The proposed amendments to the sustainable placement proposals 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 SES.

Effects arising from operation

- 5.2.202 The proposed amendments to the sustainable placement proposals will not give rise to a new or different significant effect during operation and will not change the level of significance of the effects reported in the main ES and SES.

Mitigation and residual effects

- 5.2.203 The draft CoCP sets out the measures and standards of work that will be applied to the construction of the AP4 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. The general approach to mitigation to be applied across the entire AP4 revised scheme, including this amendment, is set out in Volume 1, Section 9 of the main ES.
- 5.2.204 Generic design measures will be implemented to avoid significant adverse effects on the quality and flow characteristics of surface water courses and groundwater bodies during operation of the AP4 revised scheme. 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.
- 5.2.205 No mitigation measures in addition to those identified in the main ES and SES are required.
- 5.2.206 The proposed amendment to the sustainable placement strategy will not give rise to a new or different significant residual effect and will not change the level of significance of the residual effects reported in the main ES or SES.

Cumulative effects

- 5.2.207 There are no new or different likely significant cumulative effects for water resources and flood risk as a result of the proposed amendment acting in combination with another amendment in AP4, or in AP2, or as a result of any relevant committed development interacting with the AP4 revised scheme.

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

- 5.2.208 The additional land required for the amended sustainable placement proposals in CFA6 and CFA7 and realignment of footpath U50 diversion will give rise to a different residual significant effect with regard to agriculture, forestry and soils compared to that reported in the main ES and SES and AP2 ES. Specifically, the amendment will introduce one additional new significant temporary and permanent adverse effect on an unidentified holding (possibly Pylon Farm) that was previously unaffected by the original scheme.
- 5.2.209 In respect of all other environmental topics assessed, the amendment does not change the significance of the environmental effects or proposed mitigation as set out in the main ES, SES and SES3.

5.3 Revised temporary diversion of footpaths U43, U45 and U47 (AP4-006-003)

- 5.3.1 The Bill provides for the temporary closure of footpath U43 for a period of approximately 3 months and diversion via U45, U46 and Breakspear Road South whilst the proposed flood compensation area, across which the footpath passes, is excavated (refer to maps CT-05-019a and CT-06-019a in the main ES Volume 2, CFA6 Map Book).
- 5.3.2 Footpaths U45 and U47 would be temporarily closed following reinstatement of footpath U43, for approximately seven years, for the construction of a new embankment and railway bridge over the River Pinn. The proposed diversionary route is via the Celandine Route, Breakspear Road South and footpath U43.
- 5.3.3 The diversion routes proposed in the main ES were as follows:
- footpath U43: diverted approximately 400m, from the start of footpath U44, which links only with footpaths U43 and U45, at Clack Lane, and links via Clack Lane, R144, R143 and Breakspear Road South to the west end of U43;
 - footpath U45: diverted approximately 26m, from the start of footpath U44 at the junction of Clack Lane and footpath R144, then via footpath R144, Tile Kiln Lane (Byway R183), Breakspear Road South, Copthall Road West, Copthall Road East, Bushey Road and finally footpath U48 to join up with the end of footpath U47 to the south of the CML; and
 - footpath U47: diverted approximately 720m, from the start of footpath U47, along footpath U48, Bushey Road, Copthall Road West and Breakspear Road South to the start of footpath U46.
- 5.3.4 Since submission of the Bill, a replacement diversion route for footpath U43 has been proposed, based on phasing of the construction of the replacement floodplain storage area. Initially, footpath U43 will be diverted along Footpath U45, along the east side of the River Pinn, to the adjacent footpath U46 (170m to south) during construction. At this stage of construction, footpath U46 will still be in use. Footpath U43 will then be diverted along a route parallel to Breakspear Road South. This is a diversion of approximately 280m. Footpath U43 will be closed for approximately two months commencing in 2017.
- 5.3.5 The verges on Breakspear Road South between footpaths U43 and U46 are narrow and comprise a small bund then a drainage channel. Therefore, to divert the path along a route parallel Breakspear Road South, the creation of a temporary footpath along the western side of the road is necessary (refer to map CT-05-019a in the SES and AP4 ES Volume 2, CFA6 Map Book). The land required is included in the Bill.
- 5.3.6 Following reinstatement of footpath U43 it will serve as a temporary diversion route for other footpaths whilst they are affected by the works.
- 5.3.7 Footpath U45 will be temporarily closed from late June 2017. It will be diverted along the reinstated footpath U43, along a route parallel to Breakspear Road South, including a segregated route under the existing underbridge, then via a temporary footpath to a temporary footbridge over the River Pinn, to join up with footpath U47

and the Celandine Route to the south of the CML (refer to map CT-05-019a in the SES and AP4 ES Volume 2, CFA6 Map Book). Footpath U45 will remain closed during the construction of the embankment, River Pinn bridge, and Breakspear Road South bridge, and to allow for the removal of the haul road alongside these works (refer to AP4-006-004 in Section 5.4). This is expected to last for approximately 14 months commencing in 2017.

5.3.8 The proposed alternative diversion route for footpath U47 is the reverse of the situation proposed for footpath U45 (refer to map CT-05-019a in the SES and AP4 ES Volume 2, CFA6 Map Book). The section of footpath U47 adjacent the River Pinn will remain closed during the construction of the River Pinn bridge and whilst the haul road crossing the footpath is in use. This is expected to last for approximately 14 months commencing in 2017.

5.3.9 The temporary footpath and footbridge will be required to provide access across the River Pinn to allow the proposed diversion route of U45 to connect Breakspear Road South to footpath U47 and the Celandine Route. A temporary footpath will also be required alongside Breakspear Road South from Grays Cottages to Gatemead Farm (refer to map CT-05-019a in the SES and AP4 ES Volume 2, CFA6 Map Book). Temporary user controlled crossings may be required to allow safe crossing of Breakspear Road South. Temporary narrowing of Breakspear Road under the CML is necessary to provide two-way traffic with a segregated walking route on the east side of the bridge.

5.3.10 The revised diversion of footpaths U43, U45 and U47 is not considered to make changes that require a reassessment of the environmental effects or proposed mitigation as set out in the main ES for: agriculture, forestry and soils, air quality, community, cultural heritage, ecology, land quality, socio-economics, sound, noise and vibration, and water resources and flood risk assessment. However there were changes where reassessment was considered to be required for landscape and visual assessment, and traffic and transport.

Landscape and visual assessment

Introduction

5.3.11 This section of the report describes the environmental baseline in relation to landscape and visual that is relevant to the assessment. It then identifies any new or different likely significant environmental effects as a result of the amendment, compared to those of the SES3 scheme.

Scope, assumptions and limitations

5.3.12 The assessment scope, key assumptions and limitations for landscape and visual 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. An update to the methodology for the landscape and visual assessment is also described in Volume 1 of the AP1 ES.

Existing baseline

5.3.13 The area of land required for the revised diversion of footpaths U43, U45 and U47 is located within the Harefield Farmland LCA and the Ruislip and Ickenham Residential

(South) LCA. The adjacent Ruislip Golf Course LCA would be unaffected by the amendment.

5.3.14 Viewpoints located in close proximity to the area of the AP4 amendment and which are described in the main ES (Volume 2, CFA6, Section 9.3) are:

- Viewpoint 047.2.002: view north from dwellings on Hoylake Crescent, from King George V Playing Field, from PRoW (footpaths U47 and U48, Celandine Route) north-east from Hoylake Crescent and Ickenham Cricket Club Ground;
- Viewpoint 047.2.005: view north and north-west from Brackenbury House, Farm and associated properties off Breakspear Road South, Ickenham;
- Viewpoint 048.3.003: view south-west from PRoW (footpaths U45 and U46 Celandine Route); and
- Viewpoint 048.2.005: view south from Oak Farm, Square Orchard and associated residential properties (Breakspear Road South, north of the CML) and PRoW (footpath U43).

Future baseline

Construction (2017)

5.3.15 SES3 and AP4 ES Volume 5: Appendix CT-004-000 provides details of the developments which are assumed to have been implemented by 2017, additional to those identified in the main ES and the SES and AP2 ES.

5.3.16 None of the identified developments affect the assessment of the amendment's likely construction impacts on the landscape and visual assessment.

Operation (2026)

5.3.17 SES3 and AP4 ES Volume 5: Appendix CT-004-000 provides details of the developments which are assumed to have been implemented by 2026, additional to those identified in the main ES and the SES and AP2 ES.

5.3.18 None of the identified developments affect the assessment of the amendment's likely operational impacts on the landscape and visual assessment.

Effects arising during construction

Landscape assessment

5.3.19 The footpaths U43, U45 and U47 are located within Harefield Farmland LCA to the north of the CML and Ruislip and Ickenham Residential (South) LCA as described in the main ES (Volume 2, CFA6 Report: Section 9). The River Pinn and CML define the boundary between the LCA in the area affected by the amendment. The Harefield Farmland LCA comprises a well wooded farmland with gently rolling landform, located to the west of the residential edges of West Ruislip and Ickenham, with well-established hedgerows enclosing largely pasture fields, together with smaller pockets of arable cultivation. Due to fair condition, medium tranquillity and regional landscape value, this area is considered to be of a high sensitivity to change. The main ES reported a major adverse effect on the Harefield LCA during construction due to the scale of the works within the LCA, presence of the main construction compound to

the south of the existing railway corridor, the presence of sustainable placement sites, demolition of buildings, and removal of existing vegetation.

- 5.3.20 The amendment will take place in close proximity to the construction works associated with the original scheme, no additional loss of vegetation will occur but a new temporary footbridge over the River Pinn will be in place during construction. The works will be small in scale relative to the construction activity associated with the scheme as a whole and therefore the amendment will not give rise to a new or different significant effect on the Harefield Farmland LCA.
- 5.3.21 The majority of Ruislip and Ickenham Residential (South) LCA comprises post-war residential housing in a variety of architectural styles. The River Pinn corridor provides a linear green corridor running roughly north south through the area linking to other areas of open space. Overall, due to the good condition, medium tranquillity and local value, the LCA has a medium sensitivity to change. The main ES reported minor adverse effects during construction on Ruislip and Ickenham Residential (South) LCA due to the presence of construction activity and loss of trees to the north of the railway but the activity would be screened by the existing railway and associated embankment and garden vegetation to the south of the CML.
- 5.3.22 The amendment will take place in close proximity to the construction works associated with the SES3 scheme. No additional loss of vegetation will occur but a new temporary footbridge over the River Pinn will be in place during construction. The works will be small in scale relative to the construction activity associated with the scheme as a whole and therefore the amendment will not give rise to a new or different significant effect on the Ruislip and Ickenham Residential (South) LCA.

Visual assessment

- 5.3.23 Four viewpoints were assessed as being affected by the original scheme and will also be affected by the AP4 revised scheme. They are described in the main ES (Volume 2, CFA6 Report: Section 9).
- 5.3.24 The main ES reported a moderate adverse effect during construction on Viewpoint 047.2.002: view north from dwellings on Hoylake Crescent, from King George V Playing Field, from PRoW (Footpaths U47 and U48, Celandine Route) north-east from Hoylake Crescent and Ickenham Cricket Club Ground due to the significant scale of the construction works and location of the works close to residential receptors. The revised diversion of footpaths U43, U45 and U47 will be visible from this viewpoint but will be seen in the context of the prominent construction elements of the original scheme already taking place in this location. The proposed amendment will not give rise to a new or different significant visual effect and will not change the level of significance of the effects reported in the main ES.
- 5.3.25 The main ES reported a moderate adverse effect during construction on Viewpoint 047.2.005: view north and north-west from Brackenbury House, Brackenbury Farm and associated properties off Breakspear Road South, Ickenham due to the possible views of the construction works, cranes and the conveyor associated with the construction of the new railway tracks and bridge over Breakspear Road South from the properties. The revised diversion of footpaths U43, U45 and U47 will be visible from this viewpoint but will be seen in the context of the prominent construction elements of the original scheme already taking place in this location. The proposed

amendment will not give rise to a new or different significant visual effect and will not change the level of significance of the effects reported in the main ES.

- 5.3.26 The main ES reported a major adverse effect during construction on viewpoint 048.3.003: view south-west from PRoW (footpaths U45 and U46 Celandine Route) due to the removal of vegetation to the north of the CML as it will open up views from the PRoW of the construction of new landform associated with the new tracks and Breakspear Road South overbridge. The revised diversion of footpaths U43, U45 and U47 will be visible from this viewpoint but will be seen in the context of the prominent construction elements of the original scheme already taking place in this location. The proposed amendment will not give rise to a new or different significant visual effect and will not change the level of significance of the effects reported in the main ES.
- 5.3.27 The main ES reported a major adverse effect during construction on Viewpoint 048.2.005: view south from Oak Farm, Square Orchard and associated residential properties (Breakspear Road South, north of the CML) and PRoW (footpath U43) due to the direct and close views from Oak Farm, of the construction activity through the demolition of its stable and the outbuilding to the south of the property and the close proximity of works associated with the embankment and new bridge over Breakspear Road South. The revised diversion of footpaths U43, U45 and U47 will be visible from this viewpoint, but will be seen in the context of the prominent construction elements of the original scheme already taking place in this location. The proposed amendment will not give rise to a new or different significant visual effect and will not change the level of significance of the effects reported in the main ES.

Effects arising from operation

- 5.3.28 The main ES reported no significant effects on landscape and visual assessment during operation.
- 5.3.29 The amendment will be temporary and therefore will not give rise to any new significant effects on landscape and visual assessment during operation.

Mitigation and residual effects

- 5.3.30 No mitigation measures in addition to those identified in the main ES and SES are required.
- 5.3.31 No new or different residual significant landscape and visual effects occur as a consequence of the amendment. The significant residual effects of the AP4 revised scheme in this area are therefore unchanged from those reported in the main ES, and the SES3.

Cumulative effects

- 5.3.32 There are no new or different likely significant cumulative effects for landscape or visual as a result of the proposed amendment acting in combination with another amendment in AP4, as a result of any relevant committed development interacting with the AP4 revised scheme.

Traffic and Transport

Introduction

- 5-3-33 This section of the report describes the environmental baseline in relation to traffic and transport that is relevant to the assessment. It then identifies any new or different likely significant environmental effects as a result of the amendment, compared to those of the SES3 scheme, taking into account any relevant AP2 amendments.

Scope, assumptions and limitations

- 5-3-34 The assessment scope, key assumptions and limitations for the traffic and transport assessment are as set out Volume 1, the SMR (Appendix CT-001 -000/1) and the SMR Addendum (Appendix CT-001-000/2) of the main ES.

Existing baseline

- 5-3-35 The baseline traffic and transport information for CFA6, South Ruislip to Ickenham is as described in the main ES (Volume 2, CFA6 Report: Section 12) and the SES and AP2 ES.

Future baseline

Construction

- 5-3-36 The future baseline for construction is as reported in the main ES (Volume 2, CFA6, Section 12) and the SES and AP2 ES.

Operation (2026 and 2041)

- 5-3-37 The future baselines for operation remain unchanged from those reported in the main ES (Volume 2, CFA6, Section 12), and the SES and AP2 ES.

Effects arising during construction

- 5-3-38 The revised temporary diversions of footpaths U43, and U47 result in shorter alternative diversion routes, which are largely off-road and will not give rise to new or different significant effects during construction. In the main ES U45 was diverted permanently by less than 30m. However, with this amendment there will also be a temporary diversion of approximately 670m. This will result in a new moderate adverse significant severance effect for users of the footpath.

Effects arising during operation

- 5-3-39 The amendment will not give rise to a new or different significant operational traffic and transport effect during operation and will not change the level of significance of the effects reported in the main ES or SES.

Mitigation and residual effects

- 5-3-40 No mitigation measures in addition to those identified in the main ES and SES are required.
- 5-3-41 There is one new temporary moderate adverse significant residual effect in relation to severance for users of Footpath U45.

Cumulative effects

- 5.3.42 The above assessment has taken into account cumulative effects, including planned development by taking account of background traffic growth, as well as traffic and transport impacts of works being undertaken in other areas.
- 5.3.43 There are no new or different likely significant cumulative effects for traffic and transport as a result of AP4 amendments interacting with one another or AP2 amendments.

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

- 5.3.44 The revised temporary diversion of footpaths U43, U45 and U47 will give rise to one new significant residual traffic and transport effect in relation to severance for users of the diverted Footpath U45. The significant residual effects of the AP4 revised scheme in this area for all other environmental topics are unchanged from those reported in the main ES, SES and SES3.

5.4 Additional land required for the provision of a haul road through Uxbridge Golf Course (AP4-006-004)

- 5.4.1 The Bill provides for the A40 Western Avenue, the B467 Swakeleys Road and Harvil Road to be used as a construction traffic route (refer to Maps CT-05-019a-L1 and CT-05-019a-L2 in main ES Volume 2, CFA6 Map Book).
- 5.4.2 Since submission of the Bill, a requirement for the temporary provision of a haul road through Uxbridge Golf Course, located within CFA7, has been identified to reduce the level of traffic on Swakeleys Road/Harvil Road (see SES3 and AP4 ES Volume 2, CFA7 Report). The haul road will connect at its southern end with the eastbound slip road adjacent to the A40 Western Avenue/B467 Swakeleys Road roundabout. The southern section of the haul road will pass to the west of, and parallel to, The Drive. The northern section will pass through Uxbridge Golf Course and land to the west of Harvil Road within CFA7, which subsequently will be used as a temporary material stockpile (see AP4-006-002, in Section 5.2). The haul road will connect with Harvil Road at its northern end.
- 5.4.3 New signal-controlled junctions will be provided temporarily at both ends of the haul road, with part signalisation of Swakeleys roundabout between the A40 and Swakeleys Road. The haul road will require embankments within sections of the route.
- 5.4.4 The haul road will result in changes to traffic in CFA6 and the effects of these changes are considered here. All other effects of the haul road, located within CFA7, are considered in the SES3 and AP4 ES Volume 2, CFA7 Report.
- 5.4.5 The haul road will be constructed from the south using an additional compound within CFA7: the Uxbridge Golf Course Haul Road Satellite Compound (see SES3 and AP4 ES, CFA7 Report: Section 5.2 for details of this compound). It will be constructed from the north using the Northolt Tunnel and Earthworks Main Compound (described in the main ES).

- 5.4.6 The new Uxbridge Golf Course haul road satellite compound will:
- be operational for approximately 12 months, commencing in 2017 during construction of the haul road, and again for approximately 12 months during removal and reinstatement of the haul road planned to commence in 2023;
 - support approximately 15 workers each day throughout each of the construction works periods;
 - support approximately three workers each day throughout the period that the road is operational;
 - not provide overnight worker accommodation;
 - be accessed via the A40; and
 - be managed from Northolt Tunnel and Earthworks main compound.
- 5.4.7 The haul road will be constructed during the HS2 enabling works. It will take approximately one year to construct. It will be in operation for up to seven years, and will take a further year to remove. The haul road will provide an alternative route to replace the use of the B467 Swakeleys Road and Harvil Road, reducing construction traffic along both roads. However, the construction traffic route via the A40 Western Avenue, the B467 Swakeleys Road and Harvil Road will be retained, although subject to lower construction traffic flows than reported in Part 1 of the SES and AP2 ES.
- 5.4.8 The provision of a haul road through Uxbridge Golf Course in CFA7 is not considered to make changes in CFA6 that require a reassessment of the environmental effects or proposed mitigation as set out in the main ES for: agriculture, forestry and soils, community, cultural heritage, ecology, land quality, socio-economics, water resources and flood risk assessment. However, the haul road will result in changes to traffic in CFA6 that require a reassessment of the environmental effects or proposed mitigation as set out in the main ES for: air quality, community, sound, noise and vibration, and traffic and transport.

Air Quality

Introduction

- 5.4.9 This section of the report provides an assessment of the impacts and likely significant effects on air quality arising from the construction and operation of the amendment covering nitrogen dioxide (NO₂), particulate matter¹⁹ (PM₁₀) and dust.
- 5.4.10 With regard to air quality, the main potential effects are anticipated to result from the emissions of the above pollutants from road traffic. The road traffic emissions will arise mainly from vehicle movements using the construction traffic route along Swakeleys and Harvil Roads during the construction phase.

¹⁹ PM₁₀ describes airborne particles that can be inhaled and therefore are of concern for human health. The designation refers to particles of size less than 10 micrometres in diameter.

- 5.4.11 Detailed reports on the air quality data and assessments for this area, as well as relevant maps, are contained within Volume 5 of the SES3 and AP4 ES. These include:
- SES3 and AP4 ES Volume 5, Appendix AQ-001-006;
 - SES3 and AP4 ES Volume 5, CFA6 Map Book, Map AQ-01-006; and
 - SES3 and AP4 ES Volume 5, CFA6 Map Book, Maps AQ-02-006-01, AQ-02-006-02 and AQ-02-006-03.

- 5.4.12 Maps showing the location of the key environmental features can be found in the SES3 and AP4 ES Volume 2, CFA6 Map Books.

Scope, assumptions and limitations

- 5.4.13 The assessment scope, key assumptions and limitations and the methodology for determining the significance of effects for air quality are set out in the SMR Addendum 3 (Volume 5: Appendix CT-001 -000/4) of the SES2 and AP3 ES.
- 5.4.14 The study area for the air quality assessment has been determined on the basis of where impacts on air quality may occur where the new haul road in CFA7 has caused changes in road traffic flows within this CFA.
- 5.4.15 The assessment of construction impacts has incorporated HS2 Ltd.'s policy on the type of Heavy Goods Vehicles²⁰ (HGVs) to be used, which states, "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), the nominated undertaker will require HGVs entering these designated zones during construction, for the purposes of transporting excavated material, to be compliant with the Euro VI emission standard". Euro VI vehicles are required to have substantially lower emissions of NO_x and particulate matter than older vehicles.
- 5.4.16 The assessment of the AP4 revised scheme has assumed that the general measures detailed in Section 7 of the draft CoCP (Volume 5: Appendix CT-003-000) in the main ES will be implemented.
- 5.4.17 The Institute of Air Quality Management and Environmental Protection UK (EPUK)²¹ have issued new guidance (2015) on the consideration of air quality within the land use planning and development control process. This guidance makes changes from the previous 2010 EPUK guidance in the process of determining the impact descriptors at each receptor. For the same predicted change in pollutant concentration, the new guidance is more likely to result in an impact descriptor of 'moderate' or 'substantial' compared with the use of previous version of the guidance. For example, where the baseline NO₂ concentration is 38µg/m³ and increases by 1.5µg/m³ to 39.5µg/m³ at a receptor with the scheme, the 2010 guidance would define the impact descriptor as 'slight adverse' whilst, for the same situation, the use of the 2015 guidance would result in an impact descriptor of 'moderate adverse'. Given that the HS2 air quality methodology defines moderate (or substantial) impacts as having a significant effect,

²⁰ Heavy Goods Vehicles are defined as those with an unladen weight greater than 3.5 tonnes.

²¹ Environmental Protection UK is a national charity that provides expert policy analysis and advice on air quality, land quality, waste and noise and their effects on people and communities in terms of a wide range of issues including public health, planning, transport, energy and climate.

the use of the new guidance is likely to result in a larger number of receptors with a significant effect being reported. This outcome is even more likely for receptors where the baseline NO₂ concentration is in excess of the air quality standard, which is 40 µg/m³.

- 5.4.18 A prediction of significant effects at more receptors, relative to the main ES or SES and AP₂ ES, does not necessarily represent a change in the predicted pollutant concentrations, only in how the change has been described. This means that in comparing the assessment outcomes for this amendment against the SES, some changes arise which are only due to the change in guidance; these are shown in the tables of results for construction impacts in the SES₃ and AP₄ ES Volume 5: Appendix AQ-001-006 for annual NO₂, annual mean PM₁₀ and 24-hour PM₁₀.
- 5.4.19 The assessment of traffic emissions has used traffic data based on an estimate of the average daily flows of construction vehicle movements in peak months during construction. This assessment has conservatively assumed 2017 vehicle emission rates and 2017 background pollutant concentrations. Traffic flows are based on those reported in the SES assessment, with the addition of traffic signals at the A₄₀/Swakeleys Road roundabout, and the inclusion of a designated haul road that will divert HGVs transporting excavated material from Swakeleys Road. The haul road joins the eastbound slip road from the A₄₀, adjacent to the A₄₀/Swakeleys Road roundabout and runs approximately parallel to Swakeleys Road and Harvil Road. The haul road rejoins Harvil Road at a point close to Cophall Covert.

Existing baseline

- 5.4.20 The baseline conditions remain unchanged from the SES and AP₂ ES and remain based upon the backgrounds maps released by Defra.

Future baseline

Construction (2017)

- 5.4.21 The future baseline for construction in 2017 remains unchanged from that reported in the SES and AP₂ ES.
- 5.4.22 The SES₃ and AP₄ ES Volume 5: Appendix CT-004-000 provides details of the developments which are assumed to have been implemented by 2017, additional to those identified in the main ES and the SES and AP₂ ES.
- 5.4.23 None of the identified developments affect the assessment of the likely construction impacts of the AP₄ revised scheme on air quality.

Operation (2026)

- 5.4.24 The future baseline for construction in 2026 remains unchanged from that reported in AP₂ and the SES.
- 5.4.25 SES₃ and AP₄ ES Volume 5: Appendix CT-004-000 provides details of the developments which are assumed to have been implemented by 2026, additional to those identified in the main ES and the SES and AP₂ ES.
- 5.4.26 None of the identified developments affect the assessment of the AP₄ revised scheme's likely operational impacts on the air quality.

Effects arising during construction

- 5.4.27 The main ES identified significant adverse effects on receptors in CFA6 related to emissions from construction traffic using Swakeleys Road in particular. As detailed in the SES and AP₂ES, the SES scheme resulted in air quality effects in the area no longer being significant (see SES and AP₂ ES Volume 2, CFA6 Report).
- 5.4.28 Changes in traffic routes and flows arising from the new haul road will result in lower levels of construction traffic using Swakeleys Road and Harvil Road. This will also affect general traffic levels in the local area (see the Traffic and transport section for this amendment).
- 5.4.29 Examination of the changes in traffic flows along the affected roads has identified some areas that meet the criteria for a more detailed assessment, as set out in the SMR Addendum 3 (Appendix CT-001-000/4) of the SES₂ and AP₃ ES.
- 5.4.30 The changes to traffic arising from the amendment result in new significant beneficial effects for NO₂ at assessed receptors along Warren Road, Swakeleys Road, Harvil Road, Shoredich Close and Roker Park Avenue.
- 5.4.31 The assessment results in new significant adverse effects for NO₂ at assessed receptors along Ickenham Road. The assessment also results in new significant beneficial effects at assessed receptors along Swakeleys Road, Woodhall Road, Park Road, Harefield Road and Sharps Lane. These are reported due to the change in methodology for describing impacts, as described in paragraph 5.4.17 and are reported within Volume 5: Appendix AQ-001-006 of the SES₃ and AP₄ ES. If the main ES methodology was applied, these effects would not be determined as significant.
- 5.4.32 The assessment does not result in new or different significant effects for PM₁₀.

Effects arising from operation

- 5.4.33 The main ES reported no significant effects on air quality during operation.
- 5.4.34 The amendment will be temporary and therefore will not give rise to any new significant effects on air quality during operation.

Mitigation and Residual Effects

- 5.4.35 Emissions to the atmosphere will be controlled and managed during construction through the route-wide implementation of the CoCP.
- 5.4.36 No additional mitigation measures during construction are proposed in relation to air quality.
- 5.4.37 The changes to traffic arising from the amendment are described in detail in the traffic and transport section, and result in both positive and negative significant effects on air quality. The changes result in new significant beneficial residual effects for NO₂ at assessed receptors along Warren Road, Swakeleys Road, Harvil Road, Shoredich Close and Roker Park Avenue.
- 5.4.38 New significant adverse residual effects for NO₂ are also predicted at assessed receptors along Ickenham Road. New significant beneficial residual effects are further predicted at assessed receptors along Swakeleys Road, Woodhall Road, Park Road,

Harefield Road and Sharps Lane. These have been termed as significant due to the change in methodology for the air quality assessment.

- 5.4.39 The assessment results in no new or different significant effects for PM₁₀.

Cumulative effects

- 5.4.40 There are no new or different likely significant cumulative effects for air quality as a result of the proposed amendment acting in combination with another amendment in AP₄, or in AP₂, as a result of any relevant committed development interacting with the AP₄ revised scheme.

Community

Introduction

- 5.4.41 This section of the report describes the environmental baseline in relation to community that is relevant to the assessment. It then identifies any new or different likely significant environmental effects as a result of the amendment, compared to those of the SES₃ scheme, taking into account any amendments from the AP₂ ES that are relevant to the assessment.

Scope, assumptions and limitations

- 5.4.42 The assessment scope, key assumptions and limitations for community 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.
- 5.4.43 In some cases where significant amenity effects have been identified as a combination of HGV traffic and air quality effects, it is not possible to be precise about the geographical extent of the combined effect. As a result, these effects are not shown on the SES₃ and AP₄ ES Volume 5 Maps.

Existing baseline

- 5.4.44 The baseline community information for CFA6, South Ruislip to Ickenham is described in the main ES (Volume 2, CFA6 Report: Section 5).

Future baseline

Construction (2017)

- 5.4.45 SES₃ and AP₄ ES Volume 5: Appendix CT-004-000 provides details of the developments which are assumed to have been implemented by 2017, additional to those identified in the main ES and the SES and AP₂ ES.
- 5.4.46 None of the identified developments affect the assessment of the likely construction impacts of the AP₄ revised scheme on community.

Operation (2026)

- 5.4.47 SES₃ and AP₄ ES Volume 5: Appendix CT-004-000 provides details of the developments which are assumed to have been implemented by 2026, additional to those identified in the main ES and the SES and AP₂ ES.

- 5.4.48 None of the identified developments affect the assessment of the AP4 revised scheme's likely operational impacts on the community.

Effects arising during construction

- 5.4.49 The provision of a haul road through Uxbridge Golf Course²² means that there will be reductions in traffic flows relative to baseline along the B467 Swakeleys Road (see the Traffic and transport section for this amendment).
- 5.4.50 The main ES reported that residents on B467 Swakeleys Road (between the junction with the A40 and the junction with Harvil Road) would experience in-combination effects arising from the combination of significant increases in HGV movements, significant road traffic noise effects and significant air quality effects, resulting in a major adverse effect which was significant.
- 5.4.51 The provision of the new haul road through Uxbridge Golf Course means that the significant in-combination effects reported in the SES will no longer occur.
- 5.4.52 Residents along Ickenham Road are predicted to experience in-combination effects resulting from a significant increase in HGV movements (which are the same as those reported in the main ES) and significant air quality effects during the construction phase. The combination of these effects will result in a major adverse effect on the amenity of residents and is significant.

Effects arising from operation

- 5.4.53 The additional land required for the provision of a haul road through Uxbridge Golf Course will not give rise to any new or different significant effects on community from operation and will not change the level of significance of the effects reported in the main ES.

Mitigation and residual effects

- 5.4.54 There are no mitigation measures additional to those reported in the main ES.
- 5.4.55 The provision of a haul road through Uxbridge Golf Course means that the residual significant amenity effect reported in the main ES on the residents of the B467 Swakeleys Road will no longer occur. A new significant amenity effect is predicted affecting residents on Ickenham Road. Changes to significantly affected community resources are shown in the SES3 and AP4 ES, Volume 5 Map Book: CM-01-022-L2.

Cumulative effects

- 5.4.56 There are no new or different likely significant cumulative effects for community as a result of the proposed amendment acting in combination with another amendment in AP4, or in AP2, or as a result of any relevant committed development interacting with the AP4 revised scheme.

²² The Uxbridge Golf Course assessment is provided in CFA7.

Sound, noise and vibration

Introduction

- 5.4.57 This section of the report describes the environmental baseline in relation to sound, noise and vibration that is relevant to the assessment. It then identifies any new or different likely significant environmental effects as a result of the amendment, compared to those of the SES3 scheme.

Scope, assumptions and limitations

- 5.4.58 The assessment scope, key assumptions and limitations for sound, noise and vibration are as set out in Volume 1, the SMR (Volume 5: Appendix CT-001-000) and the SMR Addendum (Volume 5: Appendix CT-001-000) of the main ES.
- 5.4.59 Local assumptions and limitations for sound, noise and vibration are set out in main ES Volume 2 CFA6 report.

Existing baseline

- 5.4.60 The baseline sound environment for those assessment locations considered in the main ES (Volume 2 Report CFA6 and Volume 5 Appendix SV-002-006) are representative of the assessment locations affected by this amendment.
- 5.4.61 Additionally, the assessment of construction sound, noise and vibration for the haul road through Uxbridge Golf Course, located in CFA7, involves assessment of new locations in addition to those previously assessed in the main ES. In CFA6, this includes four new assessment locations around Woodhall Close and Salthill Close, however the baseline sound levels for all the new assessment locations are presented in the CFA7 report (SES3 and AP4 ES Volume 5: Appendix SV-002-007). No further measurements have been undertaken due to this amendment.
- 5.4.62 In this area, the dominant sound source is road traffic using the A40 Western Ave. Properties situated close to this road are exposed to relatively high daytime sound levels of around 60 to 65dB²³. Further back from the A40, Western Ave, sound levels reduce to around 50dB. Other sound sources in the area include other main roads, B467 Swakeleys Road and Harvil Road, intermittent local road traffic and overflying aircraft.
- 5.4.63 Further information on the existing baseline, including baseline sound levels and baseline monitoring results, is provided for this area in the main ES Volume 5: Appendix SV-002-006.

Future baseline

Construction (2017 and 2021)

- 5.4.64 With the exception of the addition of baseline sound levels for the new assessment locations, the future baseline for construction in 2017, and construction traffic in 2021, remains unchanged from that reported in the main ES (Volume 2, CFA6 Report: Section 11.3).

²³ LpAeq, 07:00-23:00.

- 5.4.65 Volume 5, Appendix CT-004-000 of the SES3 and AP4 ES provides details of the developments that are assumed to have been implemented by 2017, additional to those identified in the main ES and SES and AP2 ES.
- 5.4.66 None of the identified developments affect the assessment of the AP4 revised scheme's likely construction impacts on sound, noise and vibration.

Operation (2026)

- 5.4.67 With the exception of the addition of baseline sound levels for the new assessment locations, the future baseline for operation in 2026 remains unchanged from that reported in the main ES (Volume 2, CFA6 Report: Section 11.3).
- 5.4.68 Volume 5, Appendix CT-004-000 of the SES3 and AP4 ES provides details of the developments that are assumed to have been implemented by 2026, additional to those identified in the main ES and SES and AP2 ES.
- 5.4.69 None of the identified developments affect the assessment of the AP4 revised scheme's likely operation impacts on sound, noise and vibration.

Effects arising during construction

- 5.4.70 The proposed changes brought about by the amendment will lead to additional works associated with the construction, use and removal of the haul road and changes to road traffic flows associated with the amendment.
- 5.4.71 An assessment has been undertaken to determine whether construction noise and vibration associated with the amendment would result in a likely significant effect, using the significance criteria detailed in the main ES (Volume 5: Appendix SV-001-000).
- 5.4.72 As the haul road and the majority of sensitive receptors potentially affected by noise from the amendment are located in CFA7, more detailed information regarding the construction sound, noise and vibration assessment for this amendment is presented in the CFA7 appendix (SES3 and AP4 ES Volume 5: Appendix SV-003-007).

Residential and non-residential receptors: direct effects

- 5.4.73 The closest noise-sensitive receptors within CFA6 to the haul road through Uxbridge Golf Course are the residential properties on Woodhall Close and Salthill Close, located approximately 100m to the south of the amendment.
- 5.4.74 In the main ES, no likely significant direct construction noise effects on residential or non-residential receptors were identified in the vicinity of the amendment in CFA6.
- 5.4.75 The works associated with the amendment will not give rise to any new or different direct significant effects on residential or non-residential receptors in CFA6 compared to those reported in the main ES and SES.

Residential receptors: Indirect effects

- 5.4.76 In the main ES, a likely significant (on a community basis) indirect noise effect caused by construction traffic was reported at residential receptors immediately adjacent to B467 Swakeleys Road and Harvil Road where it passes through Ickenham (CSV06-04). As a result of the amendment, this significant indirect noise effect is no longer likely.

- 5.4.77 Significant noise effects on non-residential receptors arising from construction traffic are unlikely to occur in this area.

Effects arising from operation

- 5.4.78 The haul road will be used during the construction phase only. The amendment will not give rise to a new or different significant operational noise or vibration effect compared to those reported in the main ES, SES or SES3.

Mitigation and residual effects

- 5.4.79 The assessment of construction noise and vibration assumes the implementation of the principles and management processes set out in the draft CoCP (Volume 5: Appendix CT-003-000).
- 5.4.80 In addition to the construction noise mitigation referred to in the main ES, taller screening as described in the draft CoCP has been assumed along the edge of the construction compound boundaries and haul road.
- 5.4.81 As a result of the amendment the residual significant noise effects reported in the main ES arising from construction traffic on Harvil Road and B467 Swakeleys Road are no longer likely.

Cumulative effects

- 5.4.82 This assessment has considered the potential cumulative construction noise effects of the scheme and other committed developments.
- 5.4.83 There are no new or different likely significant cumulative effects for sound, noise and vibration as a result of the proposed amendment acting in combination with another amendment in AP4, or in AP2, or as a result of any relevant committed development interacting with the AP4 revised scheme.

Traffic and Transport

Introduction

- 5.4.84 This section of the report describes the environmental baseline in relation to traffic and transport that is relevant to the assessment. It then identifies any new or different likely significant environmental effects as a result of the amendment, compared to those of the SES scheme taking into account any relevant AP2 amendments.

Scope, assumptions and limitations

- 5.4.85 The assessment scope, key assumptions and limitations for the traffic and transport assessment are as set out Volume 1, the SMR (Appendix CT-001 -000/1) and the SMR Addendum (Appendix CT-001-000/2) of the main ES.

Existing baseline

- 5.4.86 The baseline traffic and transport information for South Ruislip to Ickenham is as described in the main ES (Volume 2, CFA6 Report: Section 12) and the SES and AP2 ES.

Future baseline

Construction

- 5.4.87 The future baseline for construction is as described in the main ES, Volume 2, CFA6 Report: Section 12 and the SES and AP2 ES.

Operation (2026 and 2041)

- 5.4.88 The future baselines for operation are as described in the main ES, Volume 2, CFA6 Report: Section 12 and the SES and AP2 ES.

Effects arising during construction

- 5.4.89 The construction of a new haul road through Uxbridge Golf Course provides an alternative construction route to the use of Harvil Road and Swakeleys Road. This results in much of the construction traffic generated at sites along Harvil Road using the haul road and, to a lesser extent, some construction traffic from Breakspear Road South is diverted to the haul road. This results in changes to construction traffic flows on Harvil Road, Breakspear Road South and Swakeleys Road:

- Swakeleys Road, south of Harvil Road – construction traffic reduces from 1,460 HGV/day (two-way) reported in Part 1 of the SES and AP2 ES to 500 HGV/day (two-way);
- Harvil Road – construction traffic reduces from 960 HGV/day (two-way) reported in Part 1 of the SES and AP2 ES to 100 HGV/day (two-way); and
- Breakspear Road South – construction traffic reduces from 200 HGV/day (two-way) reported in Part 1 of the SES and AP2 ES to 100 HGV/day (two-way).

- 5.4.90 However, while construction traffic is reduced on local roads, it still accesses the A40 via the A40/Swakeleys Road junction. This will be partly signalised to help manage and accommodate the additional traffic. Despite this, the additional traffic has the potential to increase delays at this junction.

- 5.4.91 Increased delays would result in overall traffic levels on Swakeleys Road and Harvil Road reducing compared to baseline as a result of some traffic diverting to other routes.

- 5.4.92 The reduction in construction traffic using Harvil Road and Swakeleys Road will result in a different reduced significant effect in relation to traffic severance for non-motorised users. However the level of significance will not change and will remain major adverse for both roads.

- 5.4.93 Change in traffic flows will result in different significant effects at locations previously reported in the main ES and Part 1 of the SES and AP2 ES in relation to congestion and delays at the following junctions:

- Swakeleys Roundabout – major adverse effect (moderate adverse in the main ES and Part 1 of the SES and AP2 ES);
- Swakeleys Road/Woodstock Drive – moderate adverse effect (minor adverse reported in the main ES and Part 1 of the SES and AP2 ES); and

- Swakeleys Road/Harvil Road – minor adverse effect (moderate adverse in the main ES and Part 1 of the SES and AP2 ES).

Effects arising from operation

- 5.4.94 The temporary haul road will not give rise to new or different significant effects on traffic and transport during operation and will not change the level of significance of the effects reported in the main ES and SES.

Mitigation and residual effects

- 5.4.95 The amendment includes construction of new junctions at each end of the haul road and part signalisation of the roundabout at the junction of the A40 with Swakeleys Road to mitigate adverse impacts. No other mitigation measures are proposed in addition to those set out in the main ES.
- 5.4.96 There is a major adverse significant residual effect in relation to congestion and delays at the A40/Swakeleys Roundabout (moderate reported in the main ES and Part 1 of the SES and AP2 ES) and a moderate adverse effect at the Swakeleys Road/Woodstock Drive junction (minor adverse reported in the main ES and Part 1 of the SES and AP2 ES). Detailed design of the A40/Swakeleys Road signalisation and optimisation of the traffic signals timings would be likely to further mitigate these adverse impacts. There is a minor adverse effect in relation to congestion and delays at the Swakeleys Road/Harvil Road junction (moderate adverse reported in the main ES and Part 1 of the SES and AP2 ES). The significant effects that result from construction of the new haul road through Uxbridge Golf Course are shown on the SES3 and AP4, ES, Volume 5: Traffic and Transport Map: TR-003-009.

Cumulative effects

- 5.4.97 The above assessment has taken into account cumulative effects, including planned developments by taking account of background traffic growth, as well as traffic and transport impacts of works being undertaken in neighbouring areas.
- 5.4.98 There are no new or different likely significant cumulative effects for traffic and transport as a result of AP4 amendments interacting with one another or AP2 amendments.

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

- 5.4.99 The additional land required for the provision of a haul road through Uxbridge Golf Course will give rise to new and different significant effects with regard to air quality, community, sound, noise and vibration, and traffic and transport.
- 5.4.100 There are two new adverse residual significant effects on NO₂ concentrations for two assessed receptors (on Ickenham Road and High Road, Ickenham), which arise through the use of revised assessment methodology for impacts descriptors. Previously, they would have been described as not significant.
- 5.4.101 The provision of a haul road through Uxbridge Golf Course means that the residual significant amenity effect reported in the main ES on the residents of the B467

Swakeleys Road will no longer occur. New adverse amenity effects on residents of Ickenham Road are expected as a result of changes in methodology for air quality.

- 5.4.102 As a result of the amendment the likely residual significant noise effects identified in the main ES arising from construction traffic on Harvil Road and B467 Swakeleys Road are no longer likely.
- 5.4.103 There is a major adverse significant residual effect in relation to congestion and delays at the A40/Swakeleys Roundabout (moderate reported in the main ES and Part 1 of the SES and AP2 ES) and a moderate adverse effect at the Swakeleys Road/Woodstock Drive junction (minor adverse reported in the main ES and Part 1 of the SES and AP2 ES). There is a minor adverse effect in relation to congestion and delays at the Swakeleys Road/Harvil Road junction (moderate adverse reported in the main ES and Part 1 of the SES and AP2 ES).

5.5 Provision of rail access track to the West Ruislip depot (AP4-006-005)

- 5.5.1 The Bill provides for the removal of two rail sidings, that LUL use occasionally to hold trains prior to entering their depot at West Ruislip, as part of the Northolt tunnel portal works (refer to map CT-05-018 in the main ES Volume 2, CFA6 Map Book).
- 5.5.2 No significant effects were reported in the main ES regarding the removal of the sidings.
- 5.5.3 The AP4 revised scheme proposes a new link that connects the CML to the LUL depot on the existing railway network. This will provide direct access from the west to the LUL depot at West Ruislip (there is already access to the depot from the east). The link allows a more direct access to the LUL depot, and removes the need to temporarily hold trains prior to entering the depot from the west (refer to maps CT-05-018 in the SES3 and AP4 ES Volume 2, CFA6 Map Book).
- 5.5.4 The works to construct the new link will be managed from the West Ruislip portal satellite compound and undertaken within planned possessions during the second quarter of 2017. Working hours are anticipated to be 24 hours per day during the planned possessions.
- 5.5.5 The provision of additional trackwork to provide a direct access from the west rail access track to the West Ruislip depot is not considered to make changes that require a reassessment of the environmental effects or proposed mitigation as set out in the main ES for: agriculture, forestry and soils, air quality, community, cultural heritage, ecology, land quality, landscape and visual assessment, socio-economics, traffic and transport, and water resources and flood risk. However there were changes where reassessment was considered to be required for sound, noise and vibration.

Sound, noise and vibration

Introduction

- 5.5.6 This section of the report describes the environmental baseline in relation to sound, noise and vibration that is relevant to the assessment. It then identifies any new or different likely significant environmental effects as a result of the amendment, compared to those of the SES3 scheme.

- 5.5.7 Consideration is given to the change in construction and operational noise and vibration and to the identification of new receptors not previously included in the main ES or SES and AP2 ES.

Scope, assumptions and limitations

- 5.5.8 The assessment scope, key assumptions and limitations for the sound, noise and vibration assessment 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.
- 5.5.9 Local assumptions and limitations for sound, noise and vibration are set out in main ES (Volume 2, CFA6 Report).

Existing baseline

- 5.5.10 The existing baseline sound and vibration information for this area is described in the main ES (Volume 2, CFA6 Report: Section 11.2). Baseline sound levels representative of the assessment locations affected by the amendment have been used in the construction and operational assessments.

Future baseline

Construction (2017)

- 5.5.11 The future baseline for construction in 2017, and construction traffic in 2021, remains unchanged from that reported in the main ES (Volume 2, CFA6 Report: Section 11.2).
- 5.5.12 Volume 5, Appendix CT-004-000 of the SES3 and AP4 ES provides details of the developments that are assumed to have been implemented by 2017, additional to those identified in the main ES and SES and AP2 ES.
- 5.5.13 None of the identified developments affect the assessment of the AP4 revised scheme's likely construction impacts on sound, noise and vibration.

Operation (2026)

- 5.5.14 The future baseline for operation in 2026 remains unchanged from that reported in the main ES (Volume 2, CFA6 Report: Section 11.2).
- 5.5.15 Volume 5, Appendix CT-004-000 of the SES3 and AP4 ES provides details of the developments that are assumed to have been implemented by 2026, additional to those identified in the main ES and SES and AP2 ES.
- 5.5.16 None of the identified developments affect the assessment of the AP4 revised scheme's likely operational impacts on sound, noise and vibration.

Effects arising during construction

- 5.5.17 The provision of a rail access track to the West Ruislip depot will not give rise to any new or different significant sound, noise and vibration effects during construction compared to those reported in the main ES or SES.

Effects arising from operation

- 5.5.18 SES3 identified a likely significant (on a community basis) adverse noise effect at approximately 55 dwellings and associated shared community open areas in the vicinity of The Greenway and Hoylake Crescent in Ickenham, identified as OSV6-Co1 on SES and AP2 ES Map Series SV-01 and SV-02 (SES and AP2 ES Volume 5, CFA6 Map Book).
- 5.5.19 The amendment includes the provision for two new sets of switches and crossings on the CML close to The Greenway, Ickenham, which have the potential to increase noise levels from trains operating on this existing line.
- 5.5.20 An assessment has been undertaken to determine whether operational noise levels from the amendment would result in a new or different likely significant effect, using the significance criteria detailed in the main ES (Volume 5: Appendix SV-001-000).
- 5.5.21 The predicted operational sound and vibration levels as a result of this amendment are presented in Table 11.

Table 11: Operational airborne sound level, noise impacts and effects

Assessment Location		Impact criteria										Significance criteria								Significant effect
ID	Area represented	AP4 revised scheme only (year 15 traffic)			Do nothing (Opening year baseline)			Do something (Opening year baseline plus year 15 traffic) ²⁴		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation of effect	
		D ²⁵	N ²⁶	M ²⁷	D	N	M	D	N	D	N									
410569	The Greenway, Ickenham	57	48	71/74	59	53	57	61	55	3	2	A	11	R	T	-	-	-	-	OSV6-Co1
410650	The Greenway, Ickenham	54	45	68/71	48	45	53	55	48	7	3	A	16	R	T	-	-	-	-	OSV6-Co1
412058	Hoylake Crescent, Ickenham	51	42	63/66	49	44	47	53	46	4	2	NA	11	R	T	-	-	-	-	OSV6-Co1
413146	Bushey Road, Ickenham	50	41	62/65	49	47	44	51	43	2	0	NA	17	R	T	-	-	-	-	

²⁴ Where the AP₄ revised scheme modifies an existing source, i.e. road or railway realignments, the AP₄ revised scheme only level in the table includes the sound from the modified source. In this situation the Do something (Opening year baseline + Year 15 traffic) level has been corrected so as to not double count the sound associated with the road or railway on its new and existing alignment.

²⁵ D - Day - L_{pAeq,07:00-23:00}.

²⁶ N - Night - L_{pAeq,23:00-07:00}.

²⁷ M - Max - L_{pAFmax}. In the AP₄ revised scheme only column, two values are presented. The first is the value for the HS2 mitigated train and the second is the value for the TSI compliant train. For further information refer to Volume 5: Appendix SV-001-000.

Where the change cell is coloured red this denotes a major airborne noise impact, orange denotes a moderate airborne noise impact and yellow denotes a minor airborne noise impact.

Where the type of effect cell contains NA – this means generally no adverse effects; A - an adverse effect; S - a significant adverse effect. For further information refer to the main ES Volume 5: Appendix SV-001-000.

Where the type of receptor cell contains R – this means residential; B – is non-residential. T – is traditional building construction.

- the forecast adverse effects are not considered to be significant on a community basis (further information on methodology is provided in the main ES Volume 5: Appendix SV-001-000).

Where the significant effect cell is coloured purple this denotes a significant effect has been identified.

Assessment Location		Impact criteria										Significance criteria								Significant effect
ID	Area represented	AP4 revised scheme only (year 15 traffic)			Do nothing (Opening year baseline)			Do something (Opening year baseline plus year 15 traffic) ²⁴		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation of effect	
		D ²⁵	N ²⁶	M ²⁷	D	N	M	D	N	D	N									
419154	Hoylake Crescent, Ickenham	51	42	64/67	52	44	44	52	44	1	0	NA	25	R	T	-	-	-	-	
419263	Hoylake Crescent, Ickenham	52	43	72/75	49	47	57	54	48	5	1	A	11	R	T	-	-	-	-	OSV6-Co1
422671	The Greenway, Ickenham	52	42	65/68	48	45	53	53	47	5	2	A	11	R	T	-	-	-	-	OSV6-Co1
422998	The Greenway, Ickenham	52	43	68/70	59	53	57	60	54	1	1	A	10		T	-	-	-	-	
423037	The Greenway, Ickenham	55	46	72/75	59	53	57	61	55	2	2	A	10	R	T	-	-	-	-	
700377	The Greenway, Ickenham	58	49	68/70	59	53	57	61	54	3	1	A	5	R	T	-	-	-	-	OSV6-Co1

- 5.5.22 The amendment will increase the operational airborne noise level associated with the AP₄ revised scheme, such that a further approximately 10 residential properties in The Greenway, represented by assessment location 410569, as shown in SES₃ and AP₄ Map Series SV-02, are forecast to experience minor operational airborne noise impacts. Given the proximity of these properties to the existing significant adverse operational noise effect in Ickenham, as reported within SES₃, they have been included within the significant effect identified as OSV6-Co1.
- 5.5.23 There will be an increase from approximately 55 to approximately 65 residential dwellings included within the likely significant effect in Ickenham, reference OSV6-Co1. The increase in the number of affected properties is considered to give rise to a different operational airborne noise significant effect to that reported in SES₃.
- 5.5.24 The amendment does not alter the predicted operational ground-borne noise or vibration levels presented in the main ES, SES or SES₃.

Mitigation and residual effects

- 5.5.25 No other mitigation measures are proposed other than those identified in the main ES (Volume 2, CFA6 Report: Section 11).
- 5.5.26 The provision of an access track to the West Ruislip depot will give rise to a different residual significant operational noise effect, specifically an increase in the number of affected properties from approximately 55 to approximately 65.

Cumulative effects

- 5.5.27 This assessment has considered the potential cumulative operational noise effects of the scheme and other committed developments.
- 5.5.28 There are no new or different likely significant cumulative effects for sound, noise and vibration as a result of the proposed amendment acting in combination with another amendment in AP₄, or in AP₂, as a result of any relevant committed development interacting with the AP₄ revised scheme.

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

- 5.5.29 The provision of an access track to the West Ruislip depot will give rise to a different residual significant operational noise effect, specifically an increase in the number of affected properties from approximately 55 to approximately 65. However, these do not change the level of significance of effects reported in the main ES.

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 in Section 3 and there are no further combined effects to report.

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