M54 to M6 Link Road

TR010054

Environmental Statement Addendum: Proposed Scheme Changes October 2020

Regulation 5(2)(a)

Planning Act 2008

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

October 2020

Infrastructure Planning

Planning Act 2008

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

M54 to M6 Link Road

Development Consent Order 202[ ]

8.6

Environmental Statement Addendum: Proposed Scheme Changes October 2020

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Planning Inspectorate Scheme Reference	TR010054
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1 Introduction

1.1 Background

1.1.1 Highways England (the Applicant) is developing a link road between the M54 and M6 to provide a link between Junction 1 of the M54, M6 North and the A460 to Cannock. The M54 to M6 Link Road (the Scheme) aims to reduce congestion on local / regional routes, particularly the A449 and A460, and deliver improved transport links to encourage the development of the surrounding area.

1.1.2 The likely environmental impacts and effects resulting from the Scheme during construction and operation are reported in the Environmental Statement (ES) [TR010054/APP/6.1] submitted as part of the Development Consent Order (DCO) application for the Scheme.

1.1.3 The application for the Scheme was submitted by the Applicant to the Planning Inspectorate on 30 January 2020. The application was accepted for Examination on 28 February 2020. The Pre-Examination period has no statutory timescale and has been elongated due to Covid-19 restrictions. The Examination will commence on 21 October 2020.

1.1.4 The DCO process is designed to be front-loaded and the acceptance of post submission changes are at the discretion of the Examining Authority (ExA) with guidance on the procedure for making changes during the post-acceptance phase set out in The Planning Inspectorate Advice Note 16: Requesting Changes (Version 2, March 2018). Advice Note 16 (AN16) highlights the importance, where applicant's consider changes are necessary, of making any changes as early in the examination process to allow sufficient time for participants in the examination to fully engage and comment upon such changes. The Applicant has fully considered the guidance provided within AN16 and, being mindful of this advice has resolved to proceed with a small number of changes to the Scheme.

1.1.5 A total of seven changes are proposed, these changes have arisen through detailed design work, 2020 survey results, consideration of construction methods and efforts to minimise the impacts of the Scheme on local people and the environment following discussions related to the development of Statements of Common Ground. The Applicant's notification of proposed scheme changes [AS-043/8.3] was submitted to the Planning Inspectorate on 28 July 2020.

1.2 Purpose of this report

1.2.1 This report has been produced to assess the design changes and document any alterations to the content of the ES [TR010054/APP/6.1, TR010054/APP/6.2 and TR010054/APP/6.3] and associated documents as submitted to the Planning Inspectorate on 30 January 2020.

1.2.2 On 31 July 2020 'DMRB Updates and the Impact on the DCO Application' was submitted to the Planning Inspectorate [AS-059/8.2]. This document assessed the changes to the ES and other application documents resulting from updates to the air quality and noise and vibration methodology, DMRB LA 105 and LA 111. This document also presented some minor alterations to Chapter 7: Landscape and

Visual [APP-046/6.1], Chapter 8: Biodiversity [AS-026/6.1], Chapter 12: Population and Human Health [APP-051/6.1], Chapter 15: Assessment of Cumulative Effects [APP-054/6.1] and Chapter 16: Summary [APP-055/6.1] of the ES as a result of changes to the air quality and noise chapters.

1.2.3 Alongside DMRB update document AS-059/8.2, Version 2 of Chapter 11: Noise and Vibration [AS-046/6.1] of the ES was submitted to the ExA on 30 July 2020, which reassessed the Scheme in line with DMRB LA 111. Alterations to the content of the ES as set out in this ES Addendum take into account the changes to the ES as reported in DMRB update document [AS-059/8.2] and Version 2 of Chapter 11 [AS-046/6.1].

2 Scheme Description

2.1 Post Application Design changes

2.1.1. In May 2020, the Applicant requested a minor, non-material change to the application to remove an area of the Order limits along the M54 proposed to enable alteration of an existing road sign. This sign was located along the verge of the existing highway and no alteration is now required. There was no change to the ES assessment or conclusions as a result of this change.

2.1.2. The Applicant is submitting a formal request to the ExA to make seven further changes to the application. These design changes are as follows:

- Realignment of the eastbound slip road from the M54 at Junction 1 towards Featherstone, moving it further from Featherstone village.
- Reducing the width of the link road's central reservation and placing the drainage in the verge, rather than next to it.
- Increase to the steepness of the section of the link road approaching M6 Junction 11 to reduce the height of the embankment.
- Change to the bridge design and construction method at M54 Junction 1.
- Relocation of the new bridge over the proposed link road at Hilton Lane and change to route of nearby Public Right of Way (PRoW) (Shareshill Footpath 5).
- Change to alignment of the slip road at the revised M54 Junction 1 leading on to M54 eastbound to reduce the impact on Tower House Farm.
- Amendments to the Environmental Masterplan based on 2020 survey results and ongoing consultation.

2.1.3. Table 2.1 sets out the differences between the Scheme as submitted to the Planning Inspectorate in January 2020 and the design changes assessed in this technical note. The differences between the two designs (Changes 1 - 6) are shown in Figure 1. The changes to the Environmental Masterplans are highlighted in Figure 2.

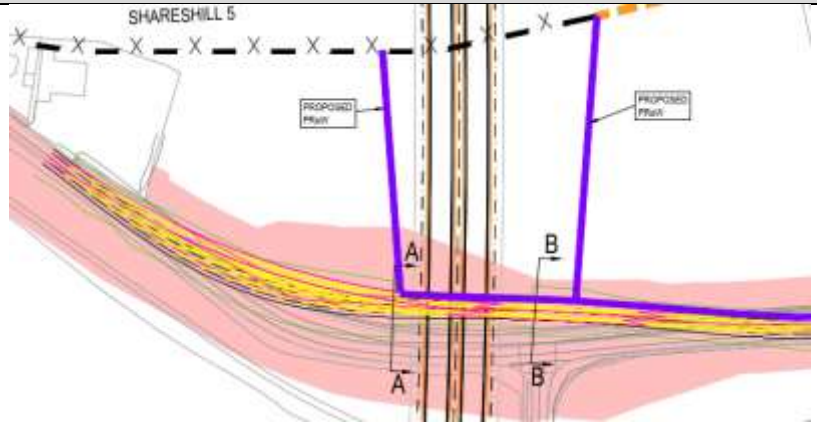
2.1.4. Alterations to Figure 2.9: Construction works [APP-065/6.2], including the addition of satellite compounds and minor alterations to soil storage areas have also been considered as part of the assessment of design changes. Where soil storage areas were partly located in an area no longer required permanently for environmental mitigation, the storage areas have been adjusted, where appropriate, to allow this land to remain with the landowner during construction and operation of the Scheme. Figure 2.9 of the ES has been revised and a new version (Version 2) submitted to the Examining Authority with this Note.

Table 2.1: Description of design changes

Element of the Scheme affected	Post- submission design change	
M54 Junction 1	**Change 1) M54 Junction 1 eastbound diverge to Featherstone** This change proposes to omit the near straight from the M54 Junction 1 eastbound diverge to Featherstone, reducing the length of the slip road. This allows the diverge to be relocated further downstream and reduces the extent of widening through the existing earth bund north of the M54. **Change 4) M54 Junction 1 change to bridge structure** This change would alter the main structure at M54 Junction 1 where the M54 passes over the junction. The main structure (currently 112m span) would be altered to two smaller structures that can be constructed adjacent to the M54 at the site compound and then moved into their final position. Given the reduced structure size there is an opportunity to shift the alignment of the road under the structure (by approximately 20m) and reduce the size of Junction 1. This alteration to the design would result in a significant reduction in the period for which traffic management has to be in place, with a temporary closure of the M54 for approximately three weeks with a diversion route in place, rather than approximately two years of complex traffic management. This would reduce the overall construction programme by six months. The signed diversion route, eastbound, will encourage drivers to proceed along the M54 to Junction 2, head north along the A449 and then turn-right at A449/A5 Gailey Island along the A5 to M6 Junction 12. Westbound drivers will be encouraged to use the M6 Junction 12 and travel along the A5 westbound, turn left at A5/A449 Gailey Island and head south	 Light blue lines illustrates the design submittted with the DCO wpplication in January 2020, the grey lines illustrate the design change as assessed in this report.

Element of the Scheme affected	Post- submission design change	
	along the A449 to the M54 at Junctions 2. Given a 'free choice' of routes, instead of using the signed diversion, some vehicles will divert from the M54 from a point further west of Junction 2 and use parallel routes such as the A5 (to destinations north and east) and the A41 (to destinations south) and a number of more minor roads. **Change 6) Change to alignment of the M54 eastbound on slip** This change proposes to alter the alignment of the slip road between Featherstone Interchange eastern roundabout and the M54 eastbound further west from its current position to reduce the impact on Tower House Farm.	
Mainline of the Scheme	**Change 2) Reduce the width of the link road** The width of the link road would be reduced by decreasing the width of the central reserve and reducing the width of the verge area by putting the surface water channel in the verge rather than adjacent to it. This change would reduce the width of the road by 4.2 m for the length of the mainline with the exception of the M54 slip roads. The northbound free flow slip road would be reduced in width between 3.2 m and 4.4 m over a length of approximately 200 m. The southbound slip road would be reduced in width between 4.1 m and 7.0 m over a length of 500 m.	

Element of the Scheme affected	Post- submission design change		
Approach to M6 Junction 11	**Change 3) Increase gradient of the incline on the approach to Junction 11, reducing the embankment height at Latherford Brook** The height of the proposed embankment south of M6 Junction 11 has been reduced resulting in a steeper incline towards the M6 Junction 11. This change reduces the vertical height of the embankment by approximately 0.7 m as it crosses over Latherford Brook. The width of the embankment would be reduced from 105 m at its widest point to 85 m, moving the base of the south-eastern side of the embankment up to 6.5 m away from the Brookfield Farm ancient woodland and the western side up to 12.5 m from the fishing pond at Brookfield Farm. A minor change has also been incorporated to the diversion route of Saredon Footpath (FP) 8 PRoW as a result of changes to the embankment. The diversion would follow the existing alignment of the PRoW more closely, utilising the existing crossing point over Watercourse 5 (Latherford Brook).		Light blue lines illustrate the design submittted with the DCO application in January 2020, the grey lines illustrate the design change as assessed in this report.
Hilton Lane Bridge	**Change 5) Relocation of Hilton Lane Overbridge and change to PRoW** Hilton Lane bridge would be constructed approximately 12 m north of the submitted design. The bridge would be constructed off-line which would avoid the need for a temporary diversion. A short section of new footway would be provided adjacent to the eastbound carriageway of Hilton Lane where the road crosses over the Scheme on Hilton Lane Bridge to provide a diversion route for Shareshill FP 5. The footway would no		

Element of the Scheme affected	Post- submission design change	
	longer be extended to tie into the existing footway on Hilton Lane west of the Scheme. Shareshill FP5 to the west of the Scheme would be retained on its current alignment until it meets the Scheme. Shareshill FP5 would then be diverted in a southerly direction parallel to the Scheme to meet Hilton Lane. The footpath would link into the new footway on Hilton Lane Bridge to allow users to cross over the mainline of the Scheme. The footpath would then divert north to tie into the current alignment of the PRoW, as proposed in the previous design. This change would avoid the need for the closure of Hilton Lane while the carriageway is relocated for provision of the footway and for the bridge construction reducing disruption to traffic.	
Environmental Mitigation	**Change 7) Revision of the Environmental Masterplan** The following changes to the Environmental Masterplans are proposed as a result of changes to the Scheme design described above, updated baseline information following the results of 2020 great crested newt surveys and further consultation with key stakeholders. These changes are illustrated in Figure 2 of this report. EM1) Reduction in the size of the construction compound to the north-west of Junction 11: The size of the compound area has been reviewed with the contractor to reduce the impact on existing habitat. This has involved detailed consideration of the plant and material storage requirements to ensure that the revised compound area is sufficient. This process has resulted in a reduction in the size of the site compound to minimise the impact on existing habitats. EM2) Removal of one ecology pond south-west of M6 Junction 11: Two ecology ponds were proposed in the ES to compensate for the loss of one pond during the construction of the Scheme assumed to contain great crested newt (GCN). This was in line with mitigation agreed with Natural England. The pond to be lost was found to not support GCN during 2020 surveys. Therefore, one pond previously proposed has been removed and only one ecological mitigation pond is required in this location. EM3) Removal of proposed species rich grassland to the south-east of M6 Junction 11: The Scheme changes reduce the overall footprint of the Scheme and therefore the extent of mitigation has been reviewed. This location is Best and Most Versatile (BMV) agricultural land (Grade 3a), with high quality soils capable of consistently producing moderate to high yields of a narrow range of arable crops. Natural England requested that the loss of BMV land be reduced wherever possible. Transforming this parcel into	

Element of the Scheme affected	Post- submission design change
	species rich grassland by inverting/scarifying the topsoil to bring the less nutrient rich subsoil to the surface would be in opposition to the need to retain BMV land. Consequently, it is proposed to remove the proposed habitat creation from the land parcel. EM4) Additional hedgerows in the north of the Scheme: Opportunities have been identified for additional hedgerow creation to provide additional biodiversity enhancements. New hedgerows have been placed in areas that would be required permanently for environmental mitigation, so no additional land acquisition is required. EM5) Reduction in woodland planting in the area between Park Road and Hilton Lane: The changes to the Scheme have reduced the loss of woodland as part of the scheme, including reduction of loss of ancient woodland, where compensatory planting had been agreed [with Natural England] at a ratio of 7:1. As a consequence, less woodland planting is required to mitigate the impact of the Scheme. EM6) Removal of three ecology ponds and wet grassland that were proposed as GCN mitigation south of Dark Lane: This habitat was proposed to provide a receptor area for GCN assumed to be present in ponds to be lost during the construction of the Scheme. These ponds were found not to support GCN during surveys in 2020, therefore the receptor area is no longer required. EM7) Reduction in the size of the southern construction compound to the east of Featherstone: The size of the compound area has been reviewed with the contractor with a view to reducing the impact on existing habitats. This has involved detailed consideration of the plant and material storage requirements to ensure that the revised compound area is sufficient. EM8) Repositioning of individual trees: Individual trees proposed to the south of the Scheme within the boundary of Hilton Park have been repositioned in line with OS 1st edition map (1900 – 1902). EM9) Removal of a strip of woodland along the length of utilities diversion (diversion of high pressure gas main to the south of the Scheme and utilities diversions within Lower Pool): The removal of woodland and tree planting within 6m of the utilities diversion for health and safety and access reasons. This has been replaced with a strip of species-rich grassland. EM10) Area of retained woodland removed from the Environmental Masterplan. These areas are to be retained by the landowner and will no longer be acquired temporarily or permanently for the purpose of the Scheme. EM11) Increase in area of ancient woodland compensation planting required due to an increased impact from nitrogen deposition on ancient woodland, following a change in the air quality assessment methodology as set out in Section 4.4 of this report. EM12) Small area of woodland screening reduced to allow landowner vehicular access to a business. EM13) Small area of woodland planting changed to species rich grassland on the Environmental Masterplan. The planting was shown in close proximity to a watercourse and was included in error on previous iterations.

3 Methodology

3.1.1 The design changes have been assessed in line with the methodologies set out in the ES [TR010054/APP/6.1]. Chapter 4: Environmental Assessment Report of the ES outlines the overarching process for the assessment of environmental impacts whilst the topic specific methodologies are set out in chapters 5 to 15 of the ES. Details of the methodology for the noise and vibration assessment are provided in Version 2 of Chapter 11: Noise and Vibration [AS-046/6.1]. Any changes to the results of the noise and vibration assessment are compared to those outlined in Version 2 of the chapter.

4 Review of Assessment Findings

4.1 Air quality

Construction

Dust assessment

4.1.1 No material differences to the construction dust risk assessment are predicted compared to that reported in the ES. Therefore, the results of the assessment remain as outlined in Chapter 5: Air quality [APP-044/6.1].

Local air quality assessment

HDV traffic

4.1.2 As the design changes reduce the timescales required for construction from 3 years to 2.5 years, the effect of the design changes is such that over the shortened construction period there would be higher hourly flows of Heavy Duty Vehicles (HDVs) during the working day. The effect of this has been assessed and it is concluded that there would be no change to the conclusion of 'not significant' as determined in Chapter 5: Air quality of the ES [APP-044/6.1].

4.1.3 Sixty-two residential receptors are predicted to experience different concentrations of nitrogen dioxide (NO_2) in the Do-Something (DS) scenario and therefore will result in changes in NO_2 between the Do-Minimum (DM) and DS scenarios with the design changes, compared to those reported in the ES [APP-044/6.1]. Table 4.1 details the changes to those results as reported in Table 1 of Appendix 5.3 [APP-167/6.3]. Receptor locations are illustrated on Figure 5.3 [APP-070/6.2]. As reported in paragraph 4.1.2 these changes would not alter the conclusions of the assessment reported in Chapter 5: Air quality of the ES [APP-044/6.1].

Table 4.1: Changes to Appendix 5.3, Table 1: Annual mean Nitrogen Dioxide (NO_2) results for construction phase

Receptor ID	ES-reported results [APP-167/6.3]		Replacement values incorporating design changes outlined in this document.	
	LTT_{E6} 2024 Do-Something NO_2 ($\mu g/m^3$)	LTT_{E6} NO_2 change ($\mu g/m^3$) (DS-DM 2024)	LTT_{E6} 2024 Do-Something NO_2 ($\mu g/m^3$)	LTT_{E6} NO_2 change ($\mu g/m^3$) (DS-DM 2024)
R307	23.1	0.1	23.2	0.2
R308	21.9	0.1	22.0	0.2
R309	21.8	0.1	21.9	0.2
R310	18.8	0.1	18.9	0.1
R312	18.4	0.1	18.5	0.1
R319	19.1	0.1	19.2	0.1
R320	19.2	0.1	19.3	0.1

Receptor ID	ES-reported results [APP-167/6.3]		Replacement values incorporating design changes outlined in this document.	
	LTT_{E6} 2024 Do-Something NO_2 ($\mu g/m^3$)	LTT_{E6} NO_2 change ($\mu g/m^3$) (DS-DM 2024)	LTT_{E6} 2024 Do-Something NO_2 ($\mu g/m^3$)	LTT_{E6} NO_2 change ($\mu g/m^3$) (DS-DM 2024)
R322	19.6	0.1	19.7	0.1
R323	19.7	0.1	19.8	0.2
R324	20.0	0.1	20.0	0.2
R325	20.1	0.1	20.2	0.2
R326	20.1	0.1	20.2	0.2
R327	20.6	0.1	20.6	0.2
R328	20.6	0.1	20.7	0.2
R329	21.1	0.1	21.2	0.2
R330	21.6	0.1	21.7	0.2
R331	22.0	0.1	22.1	0.3
R332	22.6	0.2	22.8	0.3
R333	23.5	0.2	23.6	0.3
R334	24.8	0.2	25.0	0.4
R335	25.9	0.2	26.1	0.5
R336	30.6	0.3	31.0	0.7
R341	18.1	0.1	18.2	0.1
R344	18.3	0.1	18.4	0.1
R347	18.7	0.1	18.8	0.1
R348	18.9	0.1	18.9	0.2
R349	19.1	0.1	19.2	0.2
R350	19.3	0.1	19.3	0.2
R351	19.5	0.1	19.6	0.2
R352	19.9	0.1	19.9	0.2
R353	20.5	0.1	20.6	0.2
R354	20.9	0.1	21.0	0.2
R355	20.8	0.1	20.9	0.2

Receptor ID	ES-reported results [APP-167/6.3]		Replacement values incorporating design changes outlined in this document.	
	LTT_{E6} 2024 Do-Something NO_2 ($\mu g/m^3$)	LTT_{E6} NO_2 change ($\mu g/m^3$) (DS-DM 2024)	LTT_{E6} 2024 Do-Something NO_2 ($\mu g/m^3$)	LTT_{E6} NO_2 change ($\mu g/m^3$) (DS-DM 2024)
R356	20.9	0.1	21.0	0.2
R357	20.9	0.1	21.0	0.3
R358	20.9	0.1	21.0	0.2
R359	21.5	0.2	21.6	0.3
R360	21.2	0.1	21.3	0.3
R361	20.7	0.1	20.8	0.2
R362	20.3	0.1	20.4	0.2
R363	19.9	0.1	20.0	0.2
R364	19.6	0.1	19.6	0.2
R365	19.3	0.1	19.4	0.2
R366	19.0	0.1	19.1	0.2
R369	18.9	0.1	18.6	0.1
R373	26.3	0.2	26.5	0.5
R374	36.7	0.5	37.4	1.2
R375	36.0	0.4	36.7	1.1
R376	24.8	0.2	25.1	0.5
R377	36.5	0.5	37.2	1.1
R378	26.3	0.2	26.5	0.4
R379	27.6	0.2	27.9	0.6
R380	25.7	0.2	25.8	0.4
R381	27.2	0.3	27.3	0.4
R382	25.9	0.3	26.1	0.5
R383	30.9	0.4	31.3	0.7
R384	21.7	0.2	21.6	0.2
R385	23.5	0.2	23.6	0.3
R386	19.6	0.1	19.7	0.1

Receptor ID	ES-reported results [APP-167/6.3]		Replacement values incorporating design changes outlined in this document.	
	LTT_{E6} 2024 Do-Something NO_2 ($\mu g/m^3$)	**LTT_{E6} NO_2 change ($\mu g/m^3$) (DS-DM 2024)**	**LTT_{E6} 2024 Do-Something NO_2 ($\mu g/m^3$)**	**LTT_{E6} NO_2 change ($\mu g/m^3$) (DS-DM 2024)**
Concentrations and changes in reported concentrations reported to 1 decimal place.				

4.1.4 Five residential receptors are predicted to experience different concentrations of PM_{10} in the DS scenario and, therefore, will result in changes in PM_{10} between the DM and DS scenarios with the design changes, compared to those reported in the ES [APP-044/6.1]. Table 4.2 details the changes to those results as reported in Table 4 of Appendix 5.3 [APP-167/6.3]. Receptor locations are illustrated on Figure 5.3 [APP-070/6.2]. As reported in paragraph 4.1.2 these changes would not alter the conclusions of the assessment reported in Chapter 5: Air quality of the ES [APP-044/6.1].

Table 4.2: Changes to Appendix 5.3, Table 3: Annual mean Particulate Results (PM_{10}) for construction phase

Receptor ID	ES-reported results [APP-167/6.3]		Replacement values incorporating design changes outlined in this document.	
	2024 Do-Something PM_{10} ($\mu g/m^3$)	**Change ($\mu g/m^3$) (DS-DM 2024)**	**2024 Do-Something PM_{10} ($\mu g/m^3$)**	**Change ($\mu g/m^3$) (DS-DM 2024)**
R373	14.8	<0.1	14.9	<0.1
R374	15.4	<0.1	15.4	0.1
R375	15.3	<0.1	15.4	0.1
R377	15.4	<0.1	15.5	0.1
R383	16.8	<0.1	16.8	0.1
Concentrations and changes in reported concentrations reported to 1 decimal place.				

4.1.5 Nine residential receptors are predicted to experience different concentrations of $PM_{2.5}$ in the DS scenario and, therefore, changes in $PM_{2.5}$ between the DM and DS scenarios with the design changes, compared to those reported in the ES [APP-044/6.1]. Table 4.3 details the changes to those results as reported in Table 5 of Appendix 5.3 [APP-167/6.3]. Receptor locations are illustrated on Figure 5.3 [APP-070/6.2]. As reported in paragraph 4.1.2 these changes would not alter the conclusions of the assessment reported in Chapter 5: Air quality of the ES [APP-044/6.1].

Table 4.3: Changes to Appendix 5.3, Table 5: Annual mean Particulate Results ($PM_{2.5}$) for construction phase

Receptor ID	ES-reported results [APP-167/6.3]		Replacement values incorporating design changes outlined in this document.	
	2024 Do-Something $PM_{2.5}$ ($\mu g/m^3$)	Change ($\mu g/m^3$) (DS-DM 2024)	2024 Do-Something $PM_{2.5}$ ($\mu g/m^3$)	Change ($\mu g/m^3$) (DS-DM 2024)
R307	9.3	<0.1	9.4	<0.1
R325	9.3	<0.1	9.4	<0.1
R330	9.4	<0.1	9.5	<0.1
R335	9.7	<0.1	9.8	<0.1
R374	10.6	<0.1	10.6	0.1
R375	10.5	<0.1	10.5	0.1
R377	10.6	<0.1	10.7	0.1
R380	10.0	<0.1	10.1	<0.1
R383	10.9	<0.1	10.9	0.1
Concentrations and changes in reported concentrations reported to 1 decimal place.				

Traffic management

4.1.6 Due to the design change of Junction 1 of the M54 the proposed period of traffic management at this junction is expected to reduce from over two years to three weeks. Three weeks of traffic management falls under the six month threshold for which detailed assessment needs be carried out according to DMRB HA207/07 guidance[1]. It is unlikely that this short timescale could result in noticeable changes to annual mean concentrations of NO_2, PM_{10} or $PM_{2.5}$.

4.1.7 However, qualitative assessments of the risk of exceeding the short term (1-hour) mean NO_2 objective and the short term (24 hour) mean PM_{10} objective have been carried out. There is no short term mean objective for $PM_{2.5}$.

4.1.8 All links predicted to experience a change in Annual Average Daily Traffic (AADT) of +≥1,000 vehicles during the period of traffic management have been identified and compared to known baseline conditions in the area. The 1,000 vehicle change has been considered for two sets of traffic data. Two sets of traffic data have been utilised to capture different driver responses to the traffic management.

4.1.9 The first set of traffic data describes driver behaviour which follows the planned diversionary route ("planned route"); the effect of this is to maximise the number of vehicles following the diversionary route encompassing the A449, A5 and M6. This scenario is intended to capture driver behaviour for road users who are unfamiliar

[1] This threshold has increased to two years with the revised methodology set out in DMRB LA105: Air Quality.

with the locality (e.g. long-distance travellers) or the road closures in the early stages of works. These travellers are therefore more likely to follow the signed diversion route.

4.1.10 The second set of traffic data ("unplanned route") describes a more distributed diversionary approach whereby drivers utilise a range of routes to avoid the road closures. This scenario is intended to capture driver behaviour for road users who are familiar with the locality (e.g. local commuters) or road users who have encountered the road closures during the later stages of the works. These travellers are more likely to find their own route around the road closures rather than follow the signed diversion route.

Nitrogen dioxide

4.1.11 In both traffic management scenarios (planned and unplanned route) the affected road links pass through one Air Quality Management Area (AQMA) which is designated for 1-hour mean NO_2, Walsall AQMA. Identified links within this AQMA include slip roads at Junction 10 of the M6, the A454, the B4464 and the B4484. However the 1-hour mean objective has not been exceeded within this AQMA in any year between 2012 and 2016, with the highest annual mean concentration of NO_2 being 47.5 µg/m^3 in 2016 (the most recent year of data available), which is well below the threshold of 60 µg/m^3, below which exceedances of the 1-hour mean are considered unlikely. It is therefore considered that the risk of short-term exceedances due to the traffic management in this AQMA is low.

4.1.12 Additionally, in the unplanned route scenario there are affected links in Birmingham city centre, with increases and decreases in AADT above the DMRB criteria. Overall along the A38 corridor, an improvement in AADT is predicted. Therefore, it is considered that there is no risk of short-term exceedances in this area during the period of traffic management.

4.1.13 The largest expected increase in AADT as a result of the traffic management plan is on the M6 between junctions 10A and 11 between 24,700 and 27,200 AADT, of which between 2,600 and 3,800 are HDV. There are no residential properties within 200m of this section of the M6, however Hilton Park Services is located here. At Hilton Park services, the Applicant's monitoring when annualised to 2017, shows concentrations of 53.6 µg/m^3 at a location approximately 10 m from the carriageway (M6J10AJ13_004_0710). It is possible with this large increase in AADT that concentrations could increase to the extent where the 1-hour mean is exceeded in this location. However, the service station itself (where the 1-hour mean would apply) is approximately a further 7 m back from the road, where concentrations would be lower, and in practice, people are not likely to spend a full hour in this location. Furthermore, 18 exceedances of the 1-hour mean objective value are permitted. Eighteen exceedances in the short timescale considered (three weeks) is considered unlikely.

PM_{10}

4.1.14 In both traffic management scenarios (planned and unplanned route) the affected road links pass through two AQMAs which are designated for 24-hour mean PM_{10}, Wolverhampton AQMA and Birmingham AQMA. However, the 24-hour mean

objective has not been exceeded within these AQMAs in any year between 2014 and 2018, with zero exceedances of the objective of 50 µg/m^3 recorded in 2018 (35 exceedances are permitted). Furthermore, it is not possible for 35 24-hour exceedances to occur within the three-week traffic management period alone. It is therefore considered that the risk of exceedances of the 24-hour PM_{10} objective due to the traffic management in these AQMA is low.

4.1.15 In conclusion, there is a low risk of likely significant effects on short-term air quality objectives from the implementation of the proposed three-week closure. This is because either beneficial changes are anticipated in locations sensitive to short-term changes in air quality or, on the basis of a qualitative risk assessment, it is considered unlikely that there would be either relevant exposure or sufficiently elevated concentrations of NO_2 or PM_{10}.

4.1.16 The overall conclusions of the assessment remain as outlined in Chapter 5: Air Quality of the ES [APP-044/6.1]. However, the design changes would result in a number of minor amendments to the construction assessment, these changes are identified in Table 4.4. The maximum annual mean NO_2 concentration in the construction phase DS would be below the national air quality objective. As such, the construction of the Scheme would not perceptibly worsen NO_2 concentrations that are already above objective, nor does it create any new exceedances. Neither does it perceptibly improve NO_2 concentrations above the air quality objective or remove an existing exceedance of the objective.

Table 4.4: Changes to Chapter 5: Air Quality [APP-044/6.1] Construction Assessment

Paragraph Number	Changes to text (tracked)
5.4.5	The Scheme would require works to the existing road network, which would necessitate the use of construction phase traffic management interventions during the works. The single construction period that is considered for the quantitative assessment of construction vehicle movement emissions ~~also considers the effect of traffic management on the M54~~ **does not consider traffic management interventions.** The traffic management layouts provided by the buildability advisor indicate management of traffic on the M54 through Junction 1 **for a duration of three weeks. Three weeks of traffic management falls under the threshold for which detailed assessment needs be carried out, as it is unlikely that this short timescale could result in noticeable changes to annual mean concentrations**.~~, whereby a lower speed limit would be enforced for a stretch of the motorway either side of Junction 1, as well as the diversion of a proportion of HGV traffic from the eastbound carriageway onto the Junction 1 eastbound diverge and merge slip roads. As a worst case assumption, this intervention on the M54 would coincide with when Scheme construction vehicle movements would be at their most frequent.~~
5.9.7	This section provides the predictions for the effect of ~~both traffic management (the diversion of vehicles at M54 Junction 1) and~~ additional HGVs on sensitive receptors located along affected routes for the construction phase.
5.9.10	Of the sensitive receptors for human health that were modelled to consider construction phase effects, most are predicted to experience an imperceptible change in annual mean NO_2 concentrations (±≤0.4 µg/m^3). DMRB IAN 174/13 (Ref 5.3) defines the predicted magnitude of change in concentration into bands of which imperceptible is the smallest (less than 0.4µg/m^3). Specific changes in NO_2 concentrations as a result of the Scheme's construction are only listed below where more than an imperceptible change is predicted:

Paragraph Number	Changes to text (tracked)

	• The maximum predicted worsening in of NO_2 annual mean concentrations experienced at any of the human health receptors in the construction phase study area is ~~+0.5~~ **1.2** µg/m^3.
	• There would be a worsening of **between** +0.5 µg/m^3 and **1.2 µg/m^3** of the NO_2 annual mean concentration experienced at ~~two~~ **ten** receptors at the following location:
	  • residential properties on the A460 Cannock Road (R374 and R377, **R373 to R376, R379, E382 R383**), due to an increase in HDV traffic (+420 AADT and 220 HDVs).
	  • **residential properties on Dark Lane closest to the A460 Cannock Road (R335, R336), due to an increase in HDV traffic (+420 AADT and 220 HDVs).**
	  • **residential properties on W Winds closest to the A460 Cannock Road (R377), due to an increase in HDV traffic (+420 AADT and 220 HDVs).**
	• All other receptors are predicted to experience an imperceptible increase in annual mean NO_2 concentrations.

Operation

Local air quality assessment

4.1.17 The effect of the design changes on predicted air quality at public exposure and ecological receptors has been fully assessed using detailed dispersion modelling. It is concluded that there would be no change to the assessment of 'not significant' as determined in Chapter 5: Air quality of the ES [APP-044/6.1].

4.1.18 Thirty-four residential receptors are predicted to experience differing concentrations of NO_2 in the Do-Something (DS) scenario, or changes in NO_2 between the Do-Minimum (DM) and DS scenarios with this assessed design compared to those reported in the ES [APP-044/6.1]. Table 4.5 details the resultant changes to those results reported in Table 2 of Appendix 5.3 [APP-167/6.3]. Receptor locations are illustrated on Figure 5.3 [APP-070/6.2].

Table 4.5: Changes to Appendix 5.3, Table 2: Annual mean NO_2 results for operation

Receptor ID	ES-reported results [APP-166/6.3]		Replacement values incorporating design changes outlined in this document.	
	LTT_{E6} 2024 Do-Something NO_2 (µg/m^3)	LTT_{E6} NO_2 change (µg/m^3) (DS-DM 2024)	LTT_{E6} 2024 Do-Something NO_2 (µg/m^3)	LTT_{E6} NO_2 change (µg/m^3) (DS-DM 2024)
R232	18.6	0.7	18.6	0.6
R233	18.1	1.2	18.0	1.1
R305	16.4	0.5	16.4	0.6
R306	16.9	1.7	17.0	1.8
R311	17.8	1.4	18.0	1.5
R312	19.9	2.8	19.9	2.7
R314	19.3	1.9	19.2	1.8
R315	19.1	1.7	19.1	1.6

Receptor ID	ES-reported results [APP-166/6.3]		Replacement values incorporating design changes outlined in this document.	
	LTT_{E6} 2024 Do-Something NO_2 ($\mu g/m^3$)	LTT_{E6} NO_2 change ($\mu g/m^3$) (DS-DM 2024)	LTT_{E6} 2024 Do-Something NO_2 ($\mu g/m^3$)	LTT_{E6} NO_2 change ($\mu g/m^3$) (DS-DM 2024)
R317	18.7	0.9	18.6	0.9
R318	18.4	0.8	18.4	0.7
R319	18.3	0.5	18.2	0.4
R324	17.8	-0.7	17.8	-0.8
R326	17.8	-0.9	17.7	-1.0
R331	18.0	-2.5	17.9	-2.5
R332	18.1	-3.0	18.0	-3.0
R336	19.6	-8.7	19.6	-8.8
R339	18.3	1.4	18.2	1.4
R340	18.1	1.3	18.1	1.2
R348	17.4	-0.2	17.3	-0.2
R349	17.3	-0.4	17.3	-0.5
R350	17.4	-0.6	17.3	-0.6
R351	17.4	-0.8	17.3	-0.8
R352	17.4	-1.0	17.4	-1.1
R356	17.7	-1.7	17.6	-1.7
R362	17.7	-1.2	17.6	-1.2
R364	17.6	-0.6	17.5	-0.6
R366	17.6	-0.1	17.5	-0.2
R367	17.6	0.1	17.6	0.0
R371	18.0	0.9	17.9	0.9
R372	18.2	1.1	18.1	1.1
R376	18.8	-4.2	18.8	-4.3
R380	19.1	-4.8	19.2	-4.6
R381	20.4	-4.7	20.1	-5.1
R382	19.7	-4.2	21.2	-2.7

Receptor ID	ES-reported results [APP-166/6.3]		Replacement values incorporating design changes outlined in this document.	
	LTT_{E6} 2024 Do-Something NO_2 ($\mu g/m^3$)	**LTT_{E6} NO_2 change ($\mu g/m^3$) (DS-DM 2024)**	**LTT_{E6} 2024 Do-Something NO_2 ($\mu g/m^3$)**	**LTT_{E6} NO_2 change ($\mu g/m^3$) (DS-DM 2024)**
Concentrations and changes in reported concentrations reported to 1 decimal place.				

4.1.19 Six residential receptors are predicted to experience differing concentrations of PM_{10} in the DS scenario, or changes in PM_{10} between the DM and DS scenarios with this assessed design compared to those reported in the ES [APP-044/6.1]. Table 4.6 details the changes to those results reported in Table 4 of Appendix 5.3 [APP-167/6.3]. Receptor locations are illustrated on Figure 5.3 [APP-070/6.2].

Table 4.6: Changes to Appendix 5.3, Table 4: Annual mean Particulate Results (PM_{10}) for operation

Receptor ID	ES-reported results [APP-166/6.3]		Replacement values incorporating design changes outlined in this document.	
	2024 Do-Something PM_{10} ($\mu g/m^3$)	**Change ($\mu g/m^3$) (DS-DM 2024)**	**2024 Do-Something PM_{10} ($\mu g/m^3$)**	**Change ($\mu g/m^3$) (DS-DM 2024)**
R233	13.7	0.1	13.6	0.1
R361	13.6	-0.2	13.7	-0.2
R371	13.7	0.1	13.8	0.1
R380	13.7	-0.8	13.7	-0.7
R381	13.8	-0.7	13.8	-0.8
R382	13.8	-0.3	14.0	-0.1
Concentrations and changes in reported concentrations are reported to one decimal place.				

4.1.20 Three residential receptors are predicted to experience differing concentrations of $PM_{2.5}$ in the DS scenario, or changes in PM_{10} between the DM and DS scenarios with this assessed design compared to those reported in the ES [APP-044/6.1]. Table 4.7 details the resultant changes to those results reported in Table 6 of Appendix 5.3 [APP-167/6.3]. Receptor locations are illustrated on Figure 5.3 [APP-070/6.2].

Table 4.7: Changes to Appendix 5.3, Table 6: Annual mean Particulate Results ($PM_{2.5}$) for operation

Receptor ID	ES-reported results [APP-166/6.3]		Replacement values incorporating design changes outlined in this document.	
	2024 Do-Something PM_{10} ($\mu g/m^3$)	**Change ($\mu g/m^3$) (DS-DM 2024)**	**2024 DS PM_{10} ($\mu g/m^3$)**	**Change ($\mu g/m^3$) (DS-DM 2024)**
R380	8.9	-0.8	9.0	-0.7

Receptor ID	ES-reported results [APP-166/6.3]		Replacement values incorporating design changes outlined in this document.	
	2024 Do-Something PM_{10} ($\mu g/m^3$)	Change ($\mu g/m^3$) (DS-DM 2024)	2024 DS PM_{10} ($\mu g/m^3$)	Change ($\mu g/m^3$) (DS-DM 2024)
R381	9.1	-0.7	9.0	-0.8
R382	9.0	-0.3	9.2	-0.1
Concentrations and changes in reported concentrations are reported to one decimal place.				

4.1.21 The overall conclusions of the local air quality assessment remain as outlined in Chapter 5: Air Quality of the ES [APP-044/6.1]. Hhowever, the design changes would result in a number of minor amendments to the operational assessment, these changes are identified in Table 4.8.

Table 4.8: Changes to Chapter 5: Air Quality [APP-044/6.1] Operational Assessment

Paragraph Number	Changes to text (tracked)
5.4.5	The Scheme would require works to the existing road network, which would necessitate the use of construction phase traffic management interventions during the works. The single construction period that is considered for the quantitative assessment of construction vehicle movement emissions ~~also considers the effect of traffic management on the M54~~ **does not consider traffic management interventions.** The traffic management layouts provided by the buildability advisor indicate management of traffic on the M54 through Junction 1 **for a duration of three weeks. Three weeks of traffic management falls under the threshold for which detailed assessment needs be carried out, as it is unlikely that this short timescale could result in noticeable changes to annual mean concentrations**~~., whereby a lower speed limit would be enforced for a stretch of the motorway either side of Junction 1, as well as the diversion of a proportion of HGV traffic from the eastbound carriageway onto the Junction 1 eastbound diverge and merge slip roads. As a worst case assumption, this intervention on the M54 would coincide with when Scheme construction vehicle movements would be at their most frequent.~~
5.9.7	This section provides the predictions for the effect of ~~both traffic management (the diversion of vehicles at M54 Junction 1) and~~ additional HGVs on sensitive receptors located along affected routes for the construction phase.

5.9.10	Of the sensitive receptors for human health that were modelled to consider construction phase effects, most are predicted to experience an imperceptible change in annual mean NO_2 concentrations (±≤0.4 $\mu g/m^3$). DMRB IAN 174/13 (Ref 5.3) defines the predicted magnitude of change in concentration into bands of which imperceptible is the smallest (less than 0.4$\mu g/m^3$). Specific changes in NO_2 concentrations as a result of the Scheme's construction are only listed below where more than an imperceptible change is predicted:
	• The maximum predicted worsening in of NO_2 annual mean concentrations experienced at any of the human health receptors in the construction phase study area is ~~+0.5~~ **1.2** $\mu g/m^3$.
	• There would be a worsening of **between** +0.5 $\mu g/m^3$ and **1.2 $\mu g/m^3$** of the NO_2 annual mean concentration experienced at ~~two~~ **ten** receptors at the following location:
	  ◦ residential properties on the A460 Cannock Road (~~R374 and R377~~**R373 to R376, R379, E382 and R383**), due to an increase in HDV traffic (+420 AADT and 220 HDVs).
	  ◦ residential properties on Dark Lane closest to the A460 Cannock Road (R335, R336), due to an increase in HDV traffic (+420 AADT and 220 HDVs).

Paragraph Number	Changes to text (tracked)
	• residential properties on W Winds closest to the A460 Cannock Road (R377), due to an increase in HDV traffic (+420 AADT and 220 HDVs). • All other receptors are predicted to experience an imperceptible increase in annual mean NO_2 concentrations.

5.9.17	Of the sensitive receptors for human health that were modelled and are predicted to be within the 40 µg/m³ annual mean NO_2 objective, more than half (275 out of 521) are predicted to experience an imperceptible change in annual mean NO_2 concentrations (±≤0.4 µg/m³). Specific changes in NO_2 concentrations as a result of the Scheme's operation are only listed below where more than an imperceptible change is predicted:
	• There would be improvements of >-4 µg/m³ to the NO_2 annual mean concentrations experienced at ~~14~~ **13** receptors (R334-R336, R373-**R381,** R383) located closest to the A460 Cannock Road, through Featherstone and Hilton, to the west of the Scheme, resulting in concentrations of ~~18.5~~ **18.4** µg/m³ to 21.3 µg/m³. This is due to the decrease in traffic flow on this road (-21,985 AADT, -3,072 HDVs and a change of speed band in the AM-peak, Inter-peak and PM-peak periods) as a result of the alternative route provided by the Scheme.
	• There would be improvements of between -2.1 to -4.0 µg/m³ of the NO_2 annual mean concentration experienced at 10 receptors in the following five locations:
	  • ~~six~~ **seven** receptors set further back from the A460 Cannock Road (R330-R333, R359, **R382,** R385) on Dark Lane and New Lane at Featherstone and Hilton; resulting in concentrations of 17.8 µg/m³ to ~~19.2~~ **21.2** µg/m³. This is due to the decrease in traffic flow on the A460 Cannock Road, in Hilton and Featherstone (-21,985 AADT, -3072 HDVs and a change in speed band in the AM-peak, Inter-peak and PM-peak periods), as a result of the alternative route provided by the Scheme;
	  • one receptor (R307) on Church Road, Shareshill west of the Scheme, resulting in a concentration of 17.6 µg/m³, due to the decrease in traffic flow (-23,879 AADT -3,165 HDVs and a change in speed band in the Inter-peak period) on the A460 Cannock Road, in Shareshill, as a result of the alternative route provided by the Scheme;
	  • one receptor (R259) on Gailey Roundabout, resulting in a concentration of 22.1 µg/m³, predominantly due to the decrease in traffic flow (-4,575 AADT and -337 HDVs) on the A5 between the Gailey Roundabout and the M6 at Junction 12;
	  • one receptor (R292) on Watling Street, Gailey, resulting in a concentration of 25.8 µg/m³, due to the decrease in traffic flow (-4,309 AADT and -310 HDVs) on the A5 between the Gailey Roundabout and the M6 at Junction 12; and
	  • one receptor (R253) on Stafford Road, Standeford, resulting in a concentration of 18.1 µg/m³, due to a decrease in traffic flow (-3,740 AADT and -165 HDVs on the southbound carriageway and -3,432 AADT and -113 HDVs on the northbound carriageway) on the A449.
	• There would be improvement of between -0.5 to -2.0 µg/m³ of the NO_2 annual mean concentrations experienced at ~~113~~ **114** receptors. These include the following locations:
	  • several receptors in close proximity to the A5, west of the A449 (R001-R007, R009, R010-R013, R015, R018-R020 and R022), due to a decrease in traffic and HDV flows (-2,757 AADT and -214 HDVs);
	  • a number of receptors located adjacent to the A462 and Lichfield Road corridor, east and northeast of Wolverhampton (including R157-R159, R161, R163 -R180, R182, R183, R185, and R187-R189), due to a decrease in traffic (-1,707 AADT and -310 HDVs);
	  • a number of receptors located off the A460, north of the M54 (including R239, R240, R250-R258), due to a decrease in traffic flow (-2,520 AADT and -165 HDVs on the northbound carriageway and -2,194 AADT and -86 HDVs on the southbound

Paragraph Number	Changes to text (tracked)
	carriageway) and the A449, north of the A5 (R260-R264, R266, R270-R272, R275, R277 and R279), again due to a decrease in traffic flow (-2,593 AADT and -173 HDVs); and • receptors located adjacent to New Road, between the A460 and the A449 (R386, R387, R389, R390, R392 and R393), due to a decrease in traffic flow (-2,406 AADT and -71 HDVs). • There would be a worsening of between +0.5 to +2.0 µg/m^3 of the NO_2 annual mean concentration experienced at ~~103~~ **102** receptors. These include the following locations: • receptors located adjacent to the M54, west of Junction 2 (R037, R038, R041-R044), due to an increase in traffic and HDV flows (+2,157 AADT and +218 HDVs on the eastbound carriageway and +2,403 AADT and +175 HDVs on the westbound carriageway); • receptors on the A449 south of the M54 (R046-R049, R051-R056, R058 and R078), due to an increase in traffic flow (+1,752 AADT and +296 HDVs on the northbound carriageway and +574 AADT and +16 HDVs on the southern carriageway); • receptors on the B4484, between the A460 and Lichfield Road, in Wolverhampton (R113, R115, R121, R123, R124, R129 and R130), due to an increase in traffic flow (+1,303 AADT and +40 HDVs); • receptors along the A460, south of the M54 (R134, R136-R138, R140-R145, R151, R153 and R154), due to an increase in traffic (+5,056 AADT, +298 HDVs and a change in speed band in the AM-peak, Inter-peak and PM-peak periods); • two receptors adjacent to the M6, between Junction 12 and Junction 13 (R283 and R284), due to an increase in traffic flow (+1,603 AADT and +67 HDVs on the northbound carriageway and +1984 AADT and +80 HDVs on the southbound carriageway); • multiple receptors located near to the operational Scheme (+24,168 AADT and +2,212 HDVs on the northbound carriageway and +25,154 AADT and +2,413 HDVs on the southbound carriageway), on the A460 Cannock Road (R305 and R306), Hilton Lane (R310 and R311), Dark Lane (R314-~~R319~~**R318**) and Park Road (R337-R344 and R369-R372), but set back further than those on the same roads that experience a greater level of impact; and • receptors on the A4601 between M6 Junction 11 and Wedge Mills (R404-R420, R422-R425 and R427-R429), due to an increase in traffic flow (+1,916 AADT and +140 HDVs). • There would be a worsening of between +2.1 to +4.0 µg/m^3 of the NO_2 annual mean concentration experienced at six receptors in the following three locations: • two receptors (R312 and R313) on Dark Lane, resulting in concentrations of 19.9 µg/m^3 and 19.8 µg/m^3 respectively, due to presence of traffic flows associated with the operational Scheme (+24,168 AADT and +2,212 HDVs on the northbound carriageway and +25,154 AADT and +2,413 HDVs on the southbound carriageway); • one receptor (R045) on the A449 immediately adjacent to Junction 2 of the M54, resulting in concentrations of 38.5 µg/m^3, due to the increase in flow on the M54 east of Junction 2 (+2,296 AADT and +167 on eastbound carriageway and +2355 AADT and +228 HDVs on westbound carriageway), the M54 Junction 2 eastbound slip on (+6,784 AADT and +426 HDVs and a change in speed band in the AM-peak, Inter-peak and PM-peak periods) and the nearest section of the M54/A449 roundabout at Junction 2 (+4,783 AADT and +349 HDVs), which offsets the decrease in traffic flow on the A449 Stafford Road (-433 AADT and -1,620 HDVs)

Paragraph Number	Changes to text (tracked)
	on southbound carriageway and -337 AADT and -1,731 HDVs on northbound carriageway); and • three receptors (R135, R152 and R155) on the A460 to the south of the M54, resulting in concentrations of 29.0 µg/m^3, due to an increase in traffic flow on a stretch of Cannock Road to the north of Old Fallings Lane (+2,034 AADT and +93 HDVs), and concentrations of 22.2, µg/m^3 and 21.7 µg/m^3, due to an increase in traffic flow on a stretch of Cannock Road to the north of Underhill Lane (+5,056 AADT and +298 HDVs). • There would be no worsening of more than 4 µg/m^3 of the NO_2 annual mean concentrations at any sensitive receptors.

Designated ecosystem assessment

4.1.22 Air quality impacts at ecological sites are discussed in Section 4.4 – Biodiversity of this report.

Local air quality compliance risk assessment

4.1.23 There is no change to the local air quality compliance risk assessment as a result of the design changes. No Defra PCM links are affected. The results remain as outlined in Chapter 5: Air quality of the ES [APP-044/6.1].

Regional Assessment

4.1.24 There is no change to the regional assessment as a result of the design changes as there has been no change to the operational traffic flows as a result of these changes. The results remain as outlined in Chapter 5: Air quality of the ES [APP-044/6.1].

Conclusions

4.1.25 Overall it is concluded that there would be no change to the overall conclusions of the construction or operational air quality assessment as reported in Chapter 5: Air quality of the ES [APP-044/6.1]. No likely significant air quality effects are anticipated as a result of the Scheme.

4.2 Cultural heritage

Construction

4.2.1 The proposed design changes do not result in any change to the assessment of construction effects on cultural heritage, with the exception of the period over which the change in noise level is experienced during construction. The design changes result in a six month reduction of the construction programme, however this would result in greater overlapping of construction work activities which would increase the duration for which higher than ambient noise levels are experienced at Grade I listed buildings, Hilton Hall and the Conservatory. This change would not alter the conclusions of the assessment. The following paragraphs of Chapter 6: Cultural Heritage [APP-045/6.1] should be amended as follows:

Paragraph 6.9.13 "The construction noise that would be experienced from this asset during construction is anticipated to reach levels which are slightly higher than the

*existing ambient noise levels. Noise levels are anticipated to be at this level during ~~two~~ **seven** months of the construction period."*

*Paragraph 6.9.16 "The construction noise that would be experienced from this asset would be slightly higher than the existing ambient noise levels, approximately 2 dB. This is the maximum monthly construction noise anticipated during the construction phase. Noise levels are anticipated to be at this level slightly above the ambient for a total of ~~two~~ **seven** months of the construction program."*

4.2.2 There will be no changes to the physical effects on recorded archaeological sites, or changes to the impact caused by changes in the setting of heritage assets from that reported in Chapter 6: Cultural Heritage of the ES [APP-045/6.1].

Operation

4.2.3 The proposed design changes do not result in any change to the assessment of operational effects on cultural heritage. There would be no change to the significance of heritage assets as a result of the changes in traffic noise level, lighting or visual intrusion.

4.3 Landscape and visual

Construction

4.3.1 During construction, the design changes would result in minor alterations to the construction activity assessed in the ES. Construction activity would occur in broadly the same areas as before (when considered in the context of the landscape and visual study area) and would not constitute any differences in activity type. Therefore, the effect on landscape character would remain as reported in Chapter 7: Landscape and Visual of the ES [APP-046/6.1]. In terms of visual amenity, there would likely be differences in views (in comparison to those considered at construction stage in the ES) arising from changes such as the extended retention of vegetation along Hilton Lane. However, these differences from the ES would be relatively minor and not be sufficient to alter the assessed level of effect. As a whole, the conclusions on changes to landscape character and visual amenity during construction are unchanged from those of the ES [APP-046/6.1].

Operation

4.3.2 It is considered that the operational design changes are relatively minor when considered in the context of the landscape and visual study area. The reduction in road width means that more existing woodland and other vegetation can be retained. This in turn helps to retain existing elements of the landscape character. However, the fundamental principle of development (i.e. a new highway within agricultural land) has not changed and thus the assessment of changes to the landscape character summarised in Chapter 7: Landscape and Visual of the ES remains unchanged. Whilst there may be some small changes to visual amenity during operation (in comparison to that assessed in the ES), it is felt that these changes are not going to have a notable effect on the assessed viewpoints. Overall, the conclusions on changes to landscape character and visual amenity during operation are unchanged from those reported in ES [APP-046/6.1].

Appendix 7.1 Arboricultural Impact Assessment Report

4.3.3 Environmental Statement Appendix 7.1 Arboricultural Impact Assessment Report [APP-174/6.3] has been revised and a new version (Version 2) submitted to the ExA with this report. Annex A: Tree Constraints Plans, Annex B: Tree Survey Schedule and Annex C: Tree Protection Plans have all been updated to reflect the design changes. As a result of the design changes and reporting amendments the number of tree features to be removed to facilitate the Scheme has been reduced from a total of 239 to 176 across all tree categories.

4.4 Biodiversity

4.4.1 Chapter 8: Biodiversity of the ES has been revised and a new version (Version 3) submitted to the Planning Inspectorate with this report.

4.4.2 An additional appendix, Appendix 8.15 Great Crested Newt (2020) has been produced, following further surveys undertaken between April and June 2020. That appendix provides an update to the baseline information available for biodiversity receptors. The changes to the baseline information have been included in the update to Chapter 8: Biodiversity (Version 3) of the ES.

4.4.3 Appendix 8.2: Biodiversity Metric Calculation (Version 3) has also been updated and submitted to the Planning Inspectorate with this report. The revised metric follows the methodology in The Biodiversity Metric 2.0 (Natural England, 2019) was issued for use part way through preparation of the application and the assessment of the Scheme, therefore version 1 of the metric (2012) was used to support the initial submission of the ES.

4.4.4 Chapter 8: Biodiversity of the ES (Version 3) has been updated based on the revised design incorporating design changes 1 to 7. Design change 7 captures the amendments to the Environmental Masterplan based on 2020 GCN survey results and ongoing consultation. Following an update to the air quality methodology as set out in the DMRB LA 105 the impact from nitrogen deposition was reassessed and the results reported in 'DMRB Updates and the Impacts on the DCO Application' [AS-059/8.2]. These results are presented in Version 3 of the biodiversity chapter. The majority of the change reported in the updated chapter is as a result of the change in methodology as reported in AS-059/8.2. The design changes result in minor changes to the impact on a number of receptors but do not alter the conclusions on significant residual effects resulting from nitrogen deposition, which remain as outlined in AS-059/8.2.

4.4.5 A summary of the key points of comparison between Version 2 and Version 3 of Chapter 8: Biodiversity of the ES is provided below.

Baseline

<u>2020 GCN Survey Results</u>

4.4.6 A total of 32 waterbodies were identified for survey in spring 2020 in an effort to fill in any gaps in the 2019 survey data. These surveys included those waterbodies where access was not previously possible, waterbodies that were dry in previous surveys and additional waterbodies identified after the 2019 survey season (waterbodies 29 and 70). Full details of the GCN surveys undertaken in 2020 are

presented in Appendix 8.15 [AS-not yet assigned/6.3] and Figure 8.36 [AS-not yet assigned/6.2]. These documents have been submitted alongside the documents on Scheme changes.

4.4.7 Of those 32 waterbodies, 12 could not be accessed for Habitat Suitability Index survey and one further waterbody had access revoked prior to eDNA survey.

4.4.8 Of those 19 waterbodies accessed, six waterbodies were found to be dry with no suitability for breeding GCN and two had water levels too low to sample. eDNA surveys were undertaken at a total of 11 waterbodies identified as offering suitability to support GCN and holding sufficient water for samples to be collected. No GCN were recorded during the 2020 eDNA surveys, it is therefore likely that the species is absent from these waterbodies. As a result, it is considered that four of the eleven GCN metapopulations (3, 5, 7 and 9) identified in Appendix 8.11 [APP-183/6.3] are not present.

4.4.9 A total of 13 waterbodies could not be accessed for eDNA surveys in 2020 due to a lack of landowner permission and COVID-19 concerns. Under the precautionary principle, GCN are still assumed to be present in those waterbodies that could not be surveyed in either 2019 or 2020.

4.4.10 Following the results of the 2019 and 2020 surveys, seven GCN metapopulations have been identified, where GCN are confirmed or assumed to be present. Of these seven metapopulations, two consist of known medium sized populations of GCN (4 and 6) and five consist of assumed populations (1, 2, 8a, 8b and 10). A medium population size is assumed for each metapopulation, as detailed in Appendix 8.11 [APP-183/6.3] and the new Appendix 8.15 [AS-not yet assigned/6.3] submitted alongside this document. The results of the 2019 GCN surveys are shown on Figure 8.29 [APP-133/6.2], results of the 2020 GCN surveys are shown in new figure, Figure 8.35 [AS-not yet assigned/6.2].

4.4.11 None of the waterbodies known or assumed to support GCN are situated within the Scheme boundary. Metapopulations 2, 6, 8b and 10 are located less than 100m from the Scheme boundary (distance is taken from the Scheme boundary to the closest waterbody within that metapopulation). The remaining three metapopulations (1, 4 and 8a) are located 419m, 244m and 339m from the Scheme boundary respectively.

4.4.12 A Natural England EPS licence will be sought to allow for the clearance of GCN terrestrial habitat necessary to undertake construction of the Scheme. The approach to this mitigation is detailed as part of a draft Natural England EPS derogation licence (refer to Appendix 8.3: Letter of No Impediment [APP-177/6.3]). Semi-improved grassland, woodland, hedgerows and ecology ponds provided by the Scheme will provide long-term habitat for GCN post-construction. These areas are also required to mitigate for impacts on bats and to replace those habitats lost during construction of the Scheme.

4.4.13 This update to the baseline data has been used to inform the alterations to the design of environmental mitigation (Design change 7) as illustrated in Figure 2: Updates to the Environmental Masterplan.

Construction

4.4.14 The reduction in the width of the embankment required to the south of M6 Junction 11 (Design change 3) would reduce the loss of ancient woodland within Brookfield Farm SBI and LWS. The assessment reported in Version 1 [APP-047/6.1] and 2 [AS-025/6.1] of the ES Biodiversity chapter identified 0.0015 ha of ancient woodland which would be lost during the construction of the Scheme, with a further 0.042 ha of ancient woodland located within 15 m of the construction works assumed to be lost due the potential for root damage at this distance. The change to the design would remove the direct loss of ancient woodland, limiting the loss of ancient woodland to 0.029 ha within 15 m of the construction works only. Though this presents a reduction in the loss of ancient woodland, the impact as reported in Version 1 and 2 of the Biodiversity chapter, would not alter as a result of the design changes as any loss of ancient woodland is considered to be a major adverse impact on a receptor of national importance resulting in a large adverse effect.

4.4.15 Though the design changes have reduced the overall footprint of the Scheme, this would not alter the results of the construction assessment. The area of mitigation measures required has been reduced in response to design changes 1 to 6. These reductions can be seen as part of design change 7 and indicated in Figure 2: Updates to the Environmental Masterplan. Overall, the conclusions of the construction assessment are unchanged from those reported in the ES Biodiversity chapter [APP-047/6.1]. Further details are provided in Chapter 8: Biodiversity of the ES, Version 3 submitted to the Planning Inspectorate with this report.

Operation

Designated sites of international importance

4.4.16 There are no statutory international nature conservation designations within 2 km of the Scheme or within 200 m of the Affected Road Network (ARN). The design changes outlined in Section 2 of this report would not result in any changes to the conclusions of the operational assessment on sites of international importance. No operational impacts on internationally designated sites are anticipated and no mitigation is required.

Designated sites of national importance

4.4.17 The design changes outlined in Section 2 of this report would not result in any changes to the conclusions of the operational assessment on designated sites of national importance.

4.4.18 Version 3 of the Biodiversity chapter presents updated figures for the predicted nitrogen deposition for these sites in line with the assessment reported in AS-059/8.2 ‘DMRB Updates and the impact on the DCO Application’. These changes have been incorporated into the updated Chapter to avoid the reader needing to reference two documents. As reported in AS-059/8.2, these changes do not result in changes to the conclusions of the operational assessment of impacts on SSSI as reported in Version 1 [APP-047/6.1] and 2 [AS-025/6.1] of the Biodiversity chapter.

Non-statutory designated site, ancient woodland and veteran trees

4.4.19 Chapter 8: Biodiversity, Version 3 presents the changes to the assessment of impacts from nitrogen deposition. The majority of these updates result from a change in the air quality methodology. The results presented in Versions 1 [APP-047/6.1] and 2 [AS-025/6.1] of the Biodiversity Chapter utilised air quality methodology set out in HA207/07[2]. Following an update to the air quality methodology as set out in the DMRB LA 105 the impact from nitrogen deposition was reassessed and the results reported in AS-059/8.2 'DMRB Updates and the Impacts on the DCO Application'. These results are presented in Version 3 of the biodiversity chapter but the changes in nitrogen deposition reported do not result from the design changes outlined in Section 2 of this report with the exception of four of the veteran trees outlined below which see a slight reduction in nitrogen deposition with the design changes, refer to Table 4.9.

4.4.20 The design changes would not alter the levels of nitrogen deposition predicted at non-designated sites or ancient woodland within 2 km of the Scheme or 200 m of the ARN. The slight alterations to the Scheme alignment would, however, result in a small reduction in the change in nitrogen deposition predicted at four veteran trees (T211, T214, T221 and T137) by 0.1 kg N ha^{-1} yr^{-1}, refer to Table 4.9 below. For T211 and T214, this does not change the conclusion of the assessment as the predicted nitrogen deposition is still below the >0.4 kg N ha^{-1} yr^{-1} threshold for determining whether any change is significant. Conversely, the conclusion does not change for T137 as the nitrogen deposition is still above the threshold. For T221, the conclusion does change, as the predicted nitrogen deposition is now below the >0.4 kg N ha^{-1} yr^{-1} threshold and therefore any effect on this veteran tree would be negligible.

Table 4.9: Changes in nitrogen deposition at statutory and non-satutory designated sites as a result of the design changes

Ecological site and importance (value)	HA207/07 findings reported in the ES [APP-047/6.1]	LA 105 findings reported in AS-059/8.2	Design changes and LA 105
Veteran Tree 1 (Sweet Chestnut, T211) – National importance	DS Ndep is above the critical load. The change in Ndep is +0.1 kg N ha^{-1} yr^{-1}.	DS Ndep is above the critical load. The change in Ndep is +0.3 kg N ha^{-1} yr^{-1}.	DS Ndep is above the critical load. The change in Ndep is +0.2 kg N ha^{-1} yr^{-1}.
Veteran Tree 2 (Common Oak, T214) – National importance	DS Ndep is above the critical load. The change in Ndep is +0.1 kg N ha^{-1} yr^{-1}.	DS Ndep is above the critical load. The change in Ndep is +0.4 kg N ha^{-1} yr^{-1}.	DS Ndep is above the critical load. The change in Ndep is +0.3 kg N ha^{-1} yr^{-1}.
Veteran Tree 3 (Sweet Chestnut, T221) – National importance	DS Ndep is above the critical load. The change in Ndep is +0.2 kg N ha^{-1} yr^{-1}.	DS Ndep is above the critical load. The change in Ndep is +0.5 kg N ha^{-1} yr^{-1}.	DS Ndep is above the critical load. The change in Ndep is +0.4 kg N ha^{-1} yr^{-1}.

[2] Highways Agency (2007) Design Manual for Roads and Bridges HA207/07 Air Quality

Ecological site and importance (value)	HA207/07 findings reported in the ES [APP-047/6.1]	LA 105 findings reported in AS-059/8.2	Design changes and LA 105
Veteran Tree 7 (Small-leaved Lime, T137#)– National importance	DS Ndep is above the critical load. The change in Ndep is +0.3 kg N ha^{-1} yr^{-1}.	DS Ndep is above the critical load. The change in Ndep is +0.8 kg N ha^{-1} yr^{-1}.	DS Ndep is above the critical load. The change in Ndep is +0.7 kg N ha^{-1} yr^{-1}.

Habitats

4.4.21 The design changes outlined in Section 2 of this report would not result in any changes to the conclusions of the operational assessment on habitats reported in paragraphs 8.9.146 to 8.9.148 of the Biodiversity chapter of the ES (Version 2) [AS-025/6.1].

4.4.22 Though the overall conclusions of the assessment are unaltered, the losses and gains for each habitat type has been altered by the design changes. These are reported in Version 3 of the Chapter 8: Biodiversity and Version 3 of Appendix 8.2: Biodiversity Metric Calculation. The recalculation of the biodiversity metric has used updated methodology published by Natural England, referred to as The Biodiversity Metric 2.0. The updated calculations show that following completion of the Scheme, total biodiversity units would be marginally higher, with an area based gain of 2.21% of units, a linear based gain of 26.27% and a 2.23% gain of river based units. The Scheme is within the range -5 % to +5 % for river and area based habitats (woodland, grassland etc.) which can be classed as no net loss in accordance with Table 11.9 of CIRIA C776a Good practice principles for development (Ref 8.47), and can be classed as achieving a net gain in linear (hedgerow) habitats.

Protected species and other fauna

4.4.23 The design changes outlined in Section 2 of this report would not result in any changes to the conclusions of the operational assessment on protected species reported in paragraphs 8.9.149 to 8.9.182 of the ES [AS-025/6.1].

4.5 Geology and Soils

Construction

4.5.1 It is considered that the design changes are minor, that no further assessment is required and the results of the assessment for Geology and Land Contamination remain as reported in Chapter 9: Geology and Soils of the ES [APP-048/6.1].

4.5.2 Table 9.14 of the ES [APP-048/6.1] set out the total permanent loss of ALC land (by grade) and the proposed change in land use with the Scheme. Table 4.10 outlines how the design changes would alter these figures.

Table 4.10: Changes to Table 9.14, Area of ALC permanently impacted by the Scheme

Aspect of the Scheme	Area of ALC permanently impacted (ha)							
	Grade 2		Grade 3a		Total BMV (Grade 2 and 3a)		Grade 3b	
	ES*	DC**	ES	DC	ES	DC	ES	DC
Amenity grassland	1.4	1.5	0.2	0.2	1.6	1.7	0.2	0.2
Drainage ponds	0.6	0.6	0.5	0.5	1.1	1.1	-	-
Ecology ponds	1.1	0.9			1.1	0.9	-	-
Marsh and wetlands	0.7	-	0.3	-	1 -	-	-	-
Species rich grassland	15.5	16.1	7.3	6.0	22.8	22.1	4.6	4.7
Ancient woodland compensation planting	-	0.15	1.4	1.4	1.4	1.6	0.55	1
Woodland planting	15.3	12	1.1	1.1	16.4	13.1	0.09	0.3
Hardstanding (permanently sealed)	5.8	5.2	1.9	1.7	7.7	6.9	0.8	0.7
Returned to current state (permanently acquired)	1.4	2.5	1.8	-	3.2	3.2	1	0.4
Total area of agricultural land permanently acquired	41.8	39	14.5	10.7	56.3	49.7	7.3	7.3
Total area of agricultural land temporarily acquired for construction[3]	11	12.1	4.7	6.4	15.7	18.5	1.2	1.2
Total area of agricultural land within the Scheme boundary***	52.8		19.3		72.1		8.4	

*ES = The Scheme design submitted to the planning inspectorate in January 2020

**DC = The Scheme design with the design changes proposed by the Applicant

*** Following the design changes there are a number of agricultural land parcels within the Scheme boundary for which no powers are being sought as part of the DCO Application and therefore these are not considered as temporary or permanent land acquisition.

4.5.3 Though the design changes would decrease the area of best and most versatile agricultural land (Grades 2 and 3a) permanently impacted by the Scheme. Some of this land would now be unaffected, whilst some would only be affected on a temporary basis during the construction period. This is a beneficial change, however, as set out in Table 4.11, it would not alter the significance of effects as reported in Chapter 9: Geology and Soils of the ES.

[3] These areas are required for constriction activities, satellite compounds and soils and material storage etc.

Table 4.11: Changes to Table 9.15, Summary of residual effects on geology, soils and contaminated land during construction

Description of resource/ receptor and impact	Sensitivity of receptor	Magnitude of impact	Significance of residual effects
Permanent loss of **39 ha** ~~41.8 ha~~ of soil resources BMV agricultural land Grade 2 (~~5.8 ha~~ **5.2 ha** of which would be permanently sealed under hardstanding	Very high	Major adverse	Very large adverse (Significant)
Temporary loss of **12.1 ha** ~~11 ha~~ of soil resources BMV agricultural land Grade 2	Very high	Minor adverse	Moderate adverse (Significant).
Permanent loss of **10.7 ha** ~~14.5 ha~~ of soil resources BMV agricultural land Grade 3a (~~1.9 ha~~ **1.7 ha** of which would be permanently sealed under hardstanding)	High	Moderate adverse	Moderate adverse (significant)
Temporary loss of **6.4 ha** ~~4.7~~ ha soil resources BMV agricultural land Grade 3a	High	Minor adverse	Slight adverse (not significant)

Operation

4.5.4 The proposed design changes do not result in any change to the assessment of operational effects on Geology and Soils. No alterations are required to Chapter 9: Geology and Soils of the ES [APP-048/6.1]. The results of the environmental impact assessment remain as reported in the ES.

4.6 Material Assets and Waste

Construction

Waste

4.6.1 A qualitative assessment of the design changes indicates that there is likely to be an overall reduction in the quantity of construction materials required to construct the Scheme and subsequently an overall reduction in construction waste. The Applicant's aim is to achieve a cut-fill balance; however, predicted cut and fill for the Scheme is still likely to be imbalanced and disposal of material will be required.

4.6.2 It is anticipated that the impact on landfill capacity is likely to be reduced slightly by the design changes. The Scheme would still result in less than 1% reduction or alteration in the regional capacity of waste infrastructure (specifically landfill), and there is adequate disposal capacity within the region to accommodate all the waste from the Scheme (although in practice a high proportion of waste would be recovered rather than requiring disposal). The effects therefore remain as slight adverse and not significant, as reported in Chapter 10: Material Assets and Waste [APP-049/ 6.1].

Material Assets

4.6.3 A qualitative assessment of material assets indicates that the design changes would be likely to result in an overall reduction in the quantity of construction materials required to construct the Scheme. The potential construction and demolition waste recovery rate remains at 94% and the potential recycled content for the aggregate remains at 30%. Therefore, the effects remain slight and not significant, as reported in Chapter 10: Material Assets and Waste [APP-049/ 6.1].

4.6.4 Overall, the outcome of the material assets and waste construction assessment remain as reported in Chapter 10: Material Assets and Waste [APP-049/ 6.1].

Operation

4.6.5 As recorded within the Scoping Opinion, material use and waste generation is expected to be very small during the operational and maintenance phase of the Scheme (refer to Appendix 4.1 [APP-160/6.3]). Thus, as confirmed in the Scoping Opinion, the consideration of effects associated with materials and waste during Scheme operation and maintenance have been scoped out of the assessment on the basis that the scale of such activities would be unlikely to result in a significant effect. As reported in Chapter 10: Material Assets and Waste [APP-049/6.1] the operational assessment of material use and waste generation remains scoped out of further assessment. No further assessment is required.

4.7 Noise and Vibration

4.7.1 Chapter 11: Noise and Vibration of the ES has been revised and a new version (Version 3) submitted to the ExA with this report. Appendix 11.3: Construction Phase Noise Predictions (Version 3), Appendix 11.4: Noise Modelling Details (Version 3) and Figures 11.1 to 11.5 have also been updated and submitted with this Note. A summary of the key points of comparison between Version 2 and Version 3 of Chapter 11: Noise and Vibration of the ES is provided below.

Construction

4.7.2 The key factors resulting in changes to the construction assessment are:

- the reduction in the total construction period by 6 months which result in changes to the timing of various construction works;
- slight changes in the location of a number of construction works relative to nearby receptors due to changes in the design; and
- the addition of three weeks of 24/7 working related to the closure of the M54 at Junction 1, which introduces new and different construction activities including more intensive use of the borrow pit located between Dark Lane and Hilton Lane during the closure.

4.7.3 Key changes to the construction assessment can be summarised as follows:

- Removal of significant construction noise effects (daytime and night-time) at R15A and R15B on Hilton Lane to the east of the Scheme, as a temporary road (at Hilton Lane) and changes to the nearby farm track are no longer proposed.
- Significant effects were previously identified at R10, R12, R16, R17A, R17B, R18A, R18B and R19, at these locations the following minor changes are anticipated:
  - At R10 (eastern edge of Featherstone) the significant night time effect in one month due to works to tie in the realigned A460 adjacent to the receptor remains, the magnitude of impact would increase slightly.
  - At R12 (Dark Lane) the daytime significant effect in one month remains though the magnitude of the impact is reduced. A new evening and

night-time significant effect is predicted due to the introduction of 24/7 working at the borrow pit during approximately two of the three weeks of the M54 closure at Junction 1. The haul road to the borrow pit is close to the receptor.

  - At R16 (Hilton Lane, east of the Scheme), the duration of the daytime significant effect increases from two months to three months, though the magnitude of the impact reduces. The evening significant effect is removed and the duration of the night-time significant effect is reduced from two months to one month, the magnitude of the night time impact also reduces. The changes are primarily related to the removal of the temporary road and changes to the realignment of Hilton Lane.
  - At R17A (Hilton Lane, west of the Scheme) night time significant effect remains and at R17B daytime, evening and night-time significant effects remain. However, the magnitude of impact is reduced and some changes to the source of the effects occurs, primarily due to the removal of the temporary road at Hilton Lane and the introduction of 24/7 working at the borrow pit during approximately two of the three weeks of the M54 closure at Junction 1.
  - At R18 (Hilton Lane, west of the Scheme), removal of daytime significant effect in one month. At R18B, night-time significant effect remains, though at R18A reduced from two months to one month (R18B remains one month) due to the removal of the temporary road at Hilton Lane and introduction of 24/7 working at the borrow pit during approximately two of the three weeks of the M54 closure at Junction 1.
  - At R19 (The Bungalow, Brookfield Farm) increase in duration of significant daytime construction noise effects from four to six months due to slight changes in the works close to the property.

- No significant effects were previously identified at R04, R06, R07, R09 and R13, with the design changes new significant construction noise effects of short duration are identified at these receptors as follows:
  - At R04, R06, R07, R09 and R13. At R04, R06, R07 and R09 on the south-east and east side of Featherstone new short term significant adverse effects are identified primarily related to the introduction of three weeks of 24/7 working to replace the bridge at M54 Junction 1.
  - At R13 on Park Road, off Dark Lane, new significant effects are primarily due to the introduction of 24/7 working at the borrow pit during approximately two of the three weeks of the M54 closure at Junction 1.
- The number of residential properties identified as potentially experiencing significant construction vibration annoyance effects due to works involving vibratory rollers is reduced from 77 to 58, due to slight changes in the extents of the works, including at Hilton Lane and Dark Lane.
- The conclusion with regard to the direct impact of the addition of construction traffic onto the local road network remains unchanged i.e. no significant adverse effects.

- The three week closure of the M54 at Junction 1 introduces a new source of traffic noise impacts due to re-routing of traffic around the closure. No significant traffic noise increases are anticipated on the signed diversion along the A449 and A5 due to the current relatively high volumes of traffic on these roads. Significant increases in traffic noise during the three week closure of the M54 at Junction 1 are concentrated on a small number of much more minor roads with existing low traffic flows. These minor roads are located west of Featherstone up to Calf Health to the north, Shareshill, the north-western end of Hilton Lane, the north and north-east edge of Wolverhampton and to the west of Wolverhampton. On such roads absolute traffic flows would remain low with the addition of re-rerouting traffic, however, the percentage increase in flow is large enough to result in significant increases in traffic noise levels.

Operation

4.7.4 Key changes to the operation assessment can be summarised as follows:

- There would be no change to the number of significant adverse operational traffic noise effects identified, the results remain as reported in Chapter 11: Noise and Vibration (Version 2) [AS-046/6.1].
- The significant beneficial operational traffic noise effects on properties close to the existing A460 bypassed by the Scheme would increase from 32 to 37 due to slight changes in the predicted traffic noise levels.

4.8 Population and Human Health

Construction

Private property and housing

4.8.1 There is no change to the assessment of construction impacts on private property and housing as a result of the design changes. The results remain as outlined in Chapter 12: Population and Human Health of the ES [APP-051/6.1].

Community land and assets

4.8.2 Though the three-week closure of M54 Junction 1 would result in some disruption to traffic for this short period, access to and from the A460 at Junction 1 will be maintained from the M54 west of Junction 1 and A460 south of the junction. This short-term disruption would negate the need for over two years of temporary traffic management measures, reducing the overall disruption to motorised users accessing wider community facilities. The results of the assessment of construction impacts on community land and assets remain as outlined in Chapter 12: Population and Human Health of the ES [APP-051/6.1].

Development land and business

4.8.3 The design changes would result in a reduction in the land required for the operation of the Scheme at Tower House Farm and the associated business providing motorhome services. This would ensure the majority of the yard and circulatory space would be returned to the landowner post construction, reducing the permanent impact of the Scheme on this business. However, up to 860 m^2 (part of the yard and circulatory space) would still be required temporarily during the

construction phase. Given the location and total area of land required permanently, it is anticipated that this would no longer permanently alter the operating conditions of the business. Though this is an improvement on the impact reported in Chapter 12 of the ES, this would not alter the overall conclusion, a permanent slight adverse effect is still anticipated.

Paragraph 12.9.13 "There are a number of businesses, a motorhome services business and fishing pond run from Farm Holding 5. The motorhome services business is an existing employment sites covering >1 - 5ha, therefore the sensitivity of this business is high. The Scheme would result in the temporary loss of up to 860 m2 (0.09 ha) of approximately 12,600m2 of land including part of the yard and circulatory space to accommodate the M54 Junction 1 eastbound on-slip (within the limits of deviation). This amendment to access and acquisition of land may result in changes to the operation of the business (i.e. reduced storage space) but it is unlikely to compromise the overall viability of the business as it currently operates. ~~*The Scheme would have a permanent minor adverse*~~ ***resulting in a temporary minor adverse impact. The majority of this land would be returned to the landowner post construction resulting in the permanent loss of 100 m2 (0.01 ha) of land on the edge of the yard. It is not anticipated that this loss of land would alter the operation of the business and therefore the Scheme would have a negligible*** *impact on the business resulting in a permanent slight adverse effect which is not significant."*

Agricultural land holdings

4.8.4 The design changes have resulted in some alterations to the temporary and permanent land acquisition required to construct and operate the Scheme. Of the nine agricultural holdings identified in Chapter 12: Population and Human Health of the ES [APP-051/6.1] only Agricultural Holding 9, as identified on Figure 12.3 [APP-150/6.2], would experience a change in the area required during construction and operation of the Scheme. The following amendments are required to Table 12.9 and 12.10 of the ES [APP-051/6.1].

Table 4.12: Changes to Table 12.9, Assessment of temporary effects on agricultural holdings

Holding name	Sensitivity to change	Total area required during construction	Construction severance	Magnitude of Impact	Scale of construction effects	Area to be restored to agriculture
Farm holding 9	Medium	~~26.1~~ **22.6 ha**	Minor	Moderate	Moderate adverse	~~2.8~~ **6.7 ha**

Table 4.13: Changes to Table 12.10, Assessment of permanent effects on agricultural holdings

Holding name	Sensitivity to change	Land from holding	Permanent severance	Magnitude of impact	Significance of effect
Farm holding 9	Medium	~~23.3 ha~~ **15.9 ha** including **the partial** loss of car boot site and a fishing pool	Minor	Moderate	Moderate adverse (significant)

4.8.5 Agricultural Holding 9 is part of a much larger farmed estate, though the reduction in temporary and permanent land acquisition is beneficial it would not result in a material change in the scale of land take or severance already reported. Therefore, the conclusions remain as outlined in Chapter 12: Population and Human Health [APP-051/6.1].

Walkers, cyclists and horse-riders

4.8.6 The design changes would alter the diversion route proposed for Shareshill FP5 and Saredon FP 4, 8 and 1R/2214. This change to the diversion route of Shareshill FP5 would increase the journey length for users of Shareshill FP5 by approximately 165 m compared to an increase in journey length of 120 m as reported in Chapter 12: Population and Human Health of the ES [APP-051/6.1]. Though the journey length would increase, the length of the diversion would decrease as the PRoW could be maintained on its current alignment through agricultural fields for longer, rather than being diverted along Hilton Lane. This alteration to the diversion would still result in a minor impact on journey length and would still provide improved connection to Dark Lane. However, the diversion would no longer provide a new connection along the length of Hilton Lane. Paragraph 12.9.36 of the ES should be updated as follows:

Paragraph 12.9.36 "Shareshill FP5 (low sensitivity) would be permanently severed during construction of the Scheme. ***The footpath would be diverted south adjacent to the western embankment of the Scheme*** *and realigned along Hilton Lane, over the new Hilton Lane overbridge on a new section of footway, then diverted north parallel to the Scheme to tie into the current alignment of the footpath. This would result in a minor increase in journey length of approximately ~~120~~* ***165 m****. Though this would result in an increase in journey length for walkers using this route, it would provide greater connectivity to other WCH facilities, providing a link between Hilton Lane and the new shared footway/ cycleway off Dark Lane. Therefore, this would result in a neutral effect which is not significant."*

4.8.7 Alterations to the diversion route for Saredon FP 1R/2214, Saredon 8 and Shareshill FP4 (considered as a single route in the ES) would more closely following the existing alignment of Saredon FP8 allowing the existing crossing over Watercourse 5 (Latherford Brook) to be utilised. This would result in a reduction in journey length of approximately 77 m compared to journey length reduction of approximately 64 m with the previous PRoW diversion assessed in Chapter 12: Population and Human Health of the ES [APP-051/6.1]. The conclusions of the assessment remain as outlined in paragraph 12.9.38 of the ES [APP-051/6.1], a permanent slight beneficial effect, which is not significant.

Human health

4.8.8 Although the design changes would not alter the conclusions of the human health assessment as set out in Chapter 12: Population and Human Health [APP-051/6.1], Paragraph 12.9.33 and 12.9.44 would require minor amendments to reflect the change in the construction noise effects reported in Chapter 11: Noise and Vibration (Version 3) and summarised in Section 4.7 of this report

Paragraph 12.9.33: "There is potential for residents to be affected by noise exceedances or worsening in air quality due to construction activities and

*construction traffic where present. Construction works and increased traffic noise from **re-routing of existing traffic or** additional vehicle movements including HGVs would increase noise and vibration impacts at nearby noise sensitive receptors, although these impacts would be temporary in nature."*

*Paragraph 12.9.44: "The assessment in respect of construction noise and vibration concludes that the majority of effects on noise sensitive receptors would not be significant, however receptors closest to the construction works in the vicinity of the A460 (section to be realigned), **the south-east and east side of Featherstone closest to the M54 Junction 1 closure works**, Dark Lane/**Park Road**, Hilton Lane and Brookfield Farm would experience significant adverse effects during construction. For the majority of these receptors the impact would be short term. Once specific details of the construction works are available, the potential to reduce the magnitude of construction noise impacts, for example, through the use of localised site hoarding, will be determined through the requirements in the CEMP. **Temporary significant adverse construction traffic noise effects are predicted due to re-routing of traffic during the three-week closure of the M54 at Junction 1. These impacts would be experienced at the receptors closest to a small number of minor roads with existing low traffic flows, including to the west of Featherstone up to Calf Health to the north, Shareshill, the north-western end of Hilton Lane, the north/north-east edge of Wolverhampton and to the west of Wolverhampton**"*

Operation

Private property and housing

4.8.9 There is no change to the assessment of operational impacts on private property and housing as a result of the design changes. The results remain as outlined in Chapter 12: Population and Human Health of the ES [APP-051/6.1].

Community land and assets

4.8.10 There is no change to the assessment of operational impacts on community land and assets as a result of the design changes. The results remain as outlined in Chapter 12: Population and Human Health of the ES [APP-051/6.1].

Development land and business

4.8.11 There is no change to the assessment of operational impacts on development land and business as a result of the design changes. The results remain as outlined in Chapter 12: Population and Human Health of the ES [APP-051/6.1].

Agricultural land holdings

4.8.12 There is no change to the assessment of operational impacts on agricultural land holdings as a result of the design changes. The results remain as outlined in Chapter 12: Population and Human Health of the ES [APP-051/6.1].

Walkers, cyclists and horse-riders

4.8.13 There is no change to the assessment of operational impacts on walkers, cyclists and horse riders as a result of the design changes. The results remain as outlined in Chapter 12: Population and Human Health of the ES [APP-051/6.1].

Human health

4.8.14 Although the design changes would not alter the conclusions of the human health assessment as set out in Chapter 12: Population and Human Health [APP-051/6.1], Paragraph 12.9.73 and Appendix 12.1 (Table 1.4, row 3) would require minor amendments to reflect the change in the operational noise effects reported in Chapter 11: Noise and Vibration (Version 3) and summarised in Section 4.7 of this report

*Paragraph 12.9.73 "As detailed in Chapter 11: Noise and Vibration, the majority of properties would experience either no change or a negligible change in noise levels from traffic during operation in the short term (2024). The overall trend in the study area is for a slight increase in traffic flows, and therefore traffic noise. Six residential properties (in Hilton and Shareshill) are anticipated to experience a significant adverse effect as a result of increases in traffic noise levels on the worst affected façade, whilst ~~32~~ **37** properties, close to the A460, Featherstone, and 11 properties close to Old Stafford Road, would experience a significant beneficial effect…"*

4.9 Road Drainage and the Water Environment

Surface Water

Construction

4.9.1 During construction, the design changes would result in minor alterations to the construction methodologies, removal of hard shoulder from eastbound slip at M54 Junction 1, change of main structure at M54 Junction 1, reducing overall width of link road, reducing height and width of embankment south of M6 Junction 11, and slight relocation of the Hilton bridge.

4.9.2 It is considered there would be no additional impacts with regards to surface water as a result of the proposed design changes. Although at a local level these changes may alter the nature of some works, at a development level there would be no significant change to the scope and scale of activities and thus the impact assessment and mitigation reported in Chapter 13: Road Drainage and the Water Environment of the ES [APP-052/6.1] remain the same.

4.9.3 The reduction in the size of the construction compound to the north-west of M6 Junction 11 and to the east of Featherstone are positive for the water environment, but this change would not result in any change to the impact assessment reported in Chapter 13: Road Drainage and the Water Environment of the ES [APP-052/6.1]

Operation

4.9.4 There are no amendments associated with the proposed outlined design changes that would significantly alter the surface water operational assessment as outlined in Chapter 13: Road Drainage and the Water Environment of the ES [APP-052/6.1]. Reductions in the width of the carriageway along the new link road and slip roads by reducing the width of the central reservation and the verge have varying impacts on the impermeable (i.e. hard standing) and permeable (i.e. soft verge areas) that drain to each of the 17 road catchments. However, these changes are relatively minor, resulting in an overall decrease in the impermeable area of the Scheme and do not

alter the outcome of the water quality impact assessment and treatment trains proposed.

4.9.5 The reduction in the width of the proposed carriageway and the changes to the remodelled Junction 1 on the M54 would result in a reduction in the length of proposed watercourse culverts. These changes are summarised in Table 4.11:

Table 4.14: Changes in culvert lengths

Watercourse	Original culvert lengths (approx. m)	Revised culvert lengths (approx. m)	Change (m)
Watercourse 2	182 m and 58 m (2 No. culverts)	166 m and 52 m (2 No. culverts)	Reduced 22 m
Watercourse 3	60 m	55 m	Reduced 5 m
Watercourse 4	55 m	50 m	Reduced 5m

4.9.6 For Watercourses 3 and 4, the length of the proposed culverts have been reduced by approximately 5 m. For Watercourse 2, the two culverts proposed have been reduced from 182 m to 166 m, and 58 m to 52 m, respectively. This results in a total reduction of approximately 22 m. Therefore, the total culverting of Watercourse 2 reduces from approximately 240 m to approximately 218 m. The reduced length of culverting represents approximately 10.5% of the total first order 2,100 m length of this watercourse (i.e. upstream of Watercourse 1), down from approximately 12%.

4.9.7 Overall, although reducing the length of culverts is a positive change to the design, it does not alter the outcome of the impact assessment presented in Chapter 13: Road Drainage and the Water Environment of the ES [APP-052/6.1].

4.9.8 The reduction in the width of the link road and lowering of the embankment south of M6 Junction 11 would result in a reduction in the width of the embankment as it crosses over Latherford Brook (Watercourse 5). The width of the embankment would reduce from approximately 92 m to 71 m. The width of the bridge would also reduce from 44 m to 30 m. Although this would reduce the length of Watercourse 5 (Latherford Brook) passing through and affected by new structures either side of the channel, the more important factor for assessing the potential impact on the channel is the form of the structure. In this case, a 10 m wide clear span bridge is proposed, and this remains unchanged. Therefore, although the change in the design is positive, it would not result in any change to the impact assessment reported in Chapter 13: Road Drainage and the Water Environment of the ES [APP-052/6.1] or the outcome of the WFD assessment reported in Appendix 13.4 [APP-203/6.3].

4.9.9 One ecology mitigation pond proposed to the south-west of M6 Junction 11 and three ecology mitigation ponds south of Dark Lane will no longer be provided due to 2020 surveys confirming that none of the ponds which would be lost as a result of the Scheme contain GCN.

4.9.10 Paragraphs 13.9.100 and 101 of Chapter 13: Road Drainage and the Water Environment of the ES [APP-052/6.1] provide details of the ponds that would be lost or partially lost because of the Scheme and how this would be mitigated. Paragraph 13.9.100 included an omission. An additional five un-named ponds were identified by the biodiversity assessment as reported in Chapter 8: Biodiversity of the ES but

not assessed within Chapter 13: Road Drainage and the Water Environment [APP-052/6.1] Ponds 25, 26, 29, 65 and 73 (Refer to Figure 8.29 [APP-133/6.2] for the location of these ponds) This addendum now provides an assessment of these five water features.

4.9.11 Pond 65 is located to the north of the A460 at M54 Junction (NGR SJ 95627 06770). It appears to be a small ephemeral feature surrounded by wet woodland. Pond 65 has been found not to support GCN (refer to Appendix 8.15). As this pond has been found to be frequently dry this feature it is not considered a 'water body' within Chapter 13: Road Drainage and the Water Environment and thus it is not necessary to assess its loss as part of the assessment reported in Chapter 13: Road Drainage and the Water Environment.

4.9.12 Pond 73 is located in a field of improved grassland between the A460 and Watercourse 5 Latherford Brook (SJ 95550 06571). It is described in Appendix 8.11 [APP-183/6.3] of the ES as a ditch, drainage feature connected to stream (i.e. Watercourse 5). Flows in the channel would be intermittent with it wetting up during heavy or prolonged rainfall. It is likely artificial and cut to support field drainage. From a water environment perspective, this feature is a very minor tributary of Watercourse 5. Although it may have some local uses, it is not designated or supports any aquatic protected species and given its small size and limited and intermittent flow, its importance (water quality and morphology) would be no more than low.

4.9.13 Ponds 25, 26, and 29 are all located to the east of the A460 as it approaches the M54 (NGRs SJ 94264 05126, SJ 94340 05310, and SJ 94357 05290, respectively. Ponds 25 and 26 are both small woodland ponds, although do not support GCN, water vole or otter and they offer limited amenity value. Pond 29 is a more elongated feature which had shallow, stagnant water when the HSI was carried out, but was since observed to be dry. This pond does not support GCN, water vole or otter and has only limited amenity value, its importance (water quality and morphology) would be no more than low.

4.9.14 Paragraph 13.9.100 of the ES [APP-052/6.1] should be corrected as following:

Paragraph 13.9.100 "There are a number of ponds of low importance located within the footprint of the Scheme. Two would be lost during construction, Tower House Farm pond (near Old Ride), and a pond east of Brookfield Farm. The third and fourth pond, Lower Pool and a second pond east of Brookfield Farm, would be partially lost as a result of the Scheme. ***Five additional ponds are identified as lost in Chapter 8: Biodiversity (Ponds 25, 26, 29, 65 and 73) (Refer to Appendix 8.4, 8.10 and 8.11 and new Appendix 8.15 for further details [TR010054/APP/6.3]). Although these ponds may have some local uses, they are not designated, nor have they been found to support protected species. Given their low ecological value, limited amenity value and in some cases ephemeral nature, the importance of these ponds (water quality and morphology) would be no more than low."***

4.9.15 Although four of the twelve ecology mitigation ponds are now no longer proposed, there would still be a total of eight new ponds to compensate for the total loss of seven ponds and partial loss of two ponds (an approximate 1:1 ratio). Therefore, no

change to the conclusions of the assessment reported in Chapter 13: Road Drainage and the Water Environment [APP-052/6.1] is proposed. The following amendments would be required to Paragraph 13.9.101:

*Paragraph 13.9.101 ~~"Twelve~~ **Eight** new ecology ponds would be constructed as part of the Scheme. It is considered that these would mitigate for the loss of the ~~two~~ **seven** ponds, and partial loss of Lower Pool **and a second pond east Brookfield Farm**. Therefore, on balance it is considered there would be a negligible impact on pond morphology and habitat provision. This would result in a neutral effect (not significant).*

4.9.16 All other changes to the Environmental Masterplan (Figure 2.1 to 2.7 of the ES) are not relevant to the surface water assessment.

Groundwater

Construction

4.9.17 The proposed design changes do not alter the extent of the proposed cutting and/ or embankments associated with Scheme. The proposed relocation of the Hilton Lane Overbridge does not impact on the cutting extent or depth, only the above ground structure will be relocated. As a result, there are no additional impacts predicted with regards to groundwater and the likely dewatering requirements associated with the Scheme or the construction of the Hilton Lane Overbridge. The current assessment considers that localised dewatering of groundwater would be required based on the submitted design which includes up to 7.8m deep cutting and there may be potential impacts on the baseflow to watercourse number 4. As there is no change to the location or depth of the cutting, the current conclusions with respect to the groundwater assessment remain as outlined in Chapter 13: Road Drainage and the Water Environment of the ES [APP-052/6.1].

Operation

4.9.18 There are no amendments associated with the outlined design changes that would alter the groundwater assessment during the operational period.

Flood Risk

4.9.19 The changes to the design will not impact the outcomes of the flood risk assessment, either during construction or operation of the Scheme.

4.9.20 The changes proposed to the design have not affected the structures (bridges, culverts) which would cross the five watercourses impacted by the Scheme, other than a slight reduction in the length of the structures required, due to reduced width of the link road. There has also been no change to the diversions of the watercourses assessed.

4.9.21 Whilst there has been a slight decrease in the land-take for the embankment which crosses the Latherford Brook, this change will not have improved the flood depths outlined in the flood risk assessment significantly, as the embankment still dissects natural overland flow paths.

4.9.22 There will be no change to the flood risk assessment concerning the impact of groundwater flooding as the Scheme cuttings have not been lowered.

4.9.23 There will be no change to the flood risk assessment concerning the impact of tidal flooding.

4.9.24 There will be no change to the flood risk assessment concerning the impact of flooding from sewers and drains or from artificial sources, as the design has not changed the route of the new road significantly.

4.9.25 The amount of impermeable area has been reduced, however the impact of this on surface water flood risk would be negligible.

4.9.26 The assessment of impacts on Flood Risk remain as outlined in Chapter 13: Road Drainage and the Water Environment of the ES [APP-052/6.1].

4.10 Climate

Greenhouse gas impact assessment

Construction

4.10.1 As a result of the design changes, fewer construction materials are required for the Scheme. Therefore, it is anticipated that the embodied carbon associated with the construction materials, which accounts for 61% of GHG emissions during construction, will be reduced.

4.10.2 This reduction in construction materials is also anticipated to result in a reduction in GHG emissions from a number of other key emissions sources during construction. For example, as discussed in more detail in Section 4.6 Materials Assets and Waste, there is anticipated to be a reduction in construction waste. GHG emissions associated with transportation of construction materials and waste will therefore also be reduced.

4.10.3 As described in Table 2.1, the design change at the Hilton Lane Overbridge would avoid the need for removal of mature vegetation to the south of Hilton Lane for a length of approximately 200 m.

4.10.4 The review of environmental mitigation will also have the following impacts in relation to the land use change calculations:

- Additional hedgerows to the east of the Scheme;
- Removal of woodland planting as a result of reducing the impact of the Scheme on existing habitats (e.g. avoiding direct loss of ancient woodland);
- Removal of species-rich grassland to reduce the amount of agricultural land lost to the scheme and due to reduced habitat loss across the scheme; and
- Removal of woodland and tree planting within 6m of the utilities diversion as per Cadent tree planting restrictions near gas pipes.

4.10.5 While these impacts include the removal of woodland planting and species-rich grassland, these mitigation removals are due to a decreased impact of the Scheme on existing habitats and ancient woodland. Therefore, these impacts are anticipated to balance out. All other impacts on the land use change calculations are anticipated to be minimal. The overall impact of the design changes on the land use change calculations is anticipated to be minor, and is therefore not anticipated to have an impact on the outcome of the assessment.

4.10.6 No major changes are anticipated in terms of emissions from construction activities and worker transportation.

4.10.7 The Applicant is aiming to achieve a cut-fill balance; however predicted cut and fill for the Scheme is still likely to be imbalanced and disposal of material will be required. While the design changes are likely to have an impact on the cut-fill balance built into the GHG calculations presented in Chapter 14: Climate of the ES [APP-053/ 6.1], any changes are anticipated to be minor, and are therefore not anticipated to have an impact on the outcome of the assessment.

4.10.8 Overall, the seven design changes are anticipated to result in a slight reduction in construction emissions as a result of the Scheme. Therefore, the GHG emissions presented for the construction phase of the Scheme are considered to represent a robust worst case [APP-053/ 6.1].

Operation

4.10.9 As discussed in more detail in Section 4.1 Air Quality, paragraph 4.1.24, the design changes are not anticipated to affect operational traffic flows. Therefore, associated GHG emissions, which account for 93% of operational GHG emissions, are not anticipated to change.

4.10.10 Due to the slight reduction in size of M54 Junction 1, the reduced width of the link road along the mainline and the reduced widths of the northbound free flow slip road and southbound slip road, maintenance emissions associated with road resurfacing are anticipated to decrease.

4.10.11 GHG emissions associated with operational energy use are anticipated to remain similar to those presented within Chapter 14: Climate of the ES [APP-053/6.1] as the number of pedestrian crossings, streetlights and lit traffic signs are not expected to change. Any increase or decrease in associated GHG emissions is not anticipated to be material in the context of the overall assessment as operational energy use accounts for less than 1% of operational emissions.

4.10.12 Overall, the design changes are not anticipated to affect the overall outcome of the assessment for the operational phase of the Scheme. Therefore, no further assessment is required.

Climate change resilience assessment

4.10.13 The seven design changes are not anticipated to affect the outcome of the climate change resilience assessment. Therefore, no further assessment is required.

In-combination climate change impact assessment

4.10.14 The seven design changes are not anticipated to affect the outcome of the in-combination climate change impact assessment. Therefore, no further assessment is required.

4.11 Cumulative Assessment

Cumulative impacts

4.11.1 The design changes have not resulted in any changes to the study areas used in the cumulative impacts assessment.

4.11.2 Whilst the construction period has been reduced from the previously described three years by approximately six months. There is therefore potential for a reduced overlap of the construction periods for the Scheme and other developments. However, as there is limited availability of information regarding the construction programmes of other developments, the temporal scope overlaps as described within Table 5.1.1 within Appendix 15.1 of the ES [APP-210/6.3] have not been adjusted. The assessment as reported in Chapter 15: Assessment of Cumulative Effects of the ES [APP-054/6.1] remains a worst case assessment based on the level of detail available.

Combined impacts

Construction

4.11.3 The following minor amendments are required to Table 15.4 of the ES [APP-054/6.1].

Table 4.15: Changes to Table 15.5, Summary of potential combined impacts upon a single receptor (construction)

Receptor	Value	Potential combined impacts					Mitigation	Residual (cumulative) effect
		Air Quality	Dust	Noise	Vibration	Visual		
Residential receptors on Park Road and Dark Lane (closest properties to the ~~Scheme~~ works)	High*	Worsening of the NO_2 annual mean concentration experienced at some properties, but below national air quality objective levels (not significant)	Potentially adverse effects not-significant)	Significant adverse effects are anticipated ~~(on receptors on Dark Lane only)~~	Significant adverse effects are anticipated (on receptors on Dark Lane only)	VP14: Major adverse (significant)	No additional mitigation has been identified above the measures as outlined within the Outline Environmental Management Plan (OEMP) [TR010054/APP/6.11].	**Combined impacts would particularly be felt during the period where the M54 Junction 1 is closed for three weeks and the nearby borrow pit is being worked 24/7. The noise and visual impacts are considered to be temporary but of a large scale for a receptor of high value.** There would be a temporary ~~moderate~~ **large** adverse combined effect (significant) on receptors of high value as a result of noise, vibration **(Dark Lane only)** and visual impacts.
Residential receptors on Dark Lane	**High***	**Worsening of the NO_2 annual mean**	**Potentially adverse effects**	**Significant adverse**	**No significant adverse**	**VP20 (closest viewpoint):**	**No additional mitigation has been identified above the**	**Effects are likely to be noteworthy in combination, as a**

Receptor	Value	Potential combined impacts					Mitigation	Residual (cumulative) effect
		Air Quality	Dust	Noise	Vibration	Visual		
(closest properties to the A460 Cannock Road)		**concentration experienced at some properties, but below national air quality objective levels (not significant)**	**(not-significant)**	**effects are anticipated**	**effects are anticipated**	**Slight adverse (not significant)**	**measures as outlined within the Outline Environmental Management Plan (OEMP) [TR010054/APP/6.11].**	**result of impacts on visual amenity, noise and dust. Slight adverse.**
Residential receptors on the **south-east and east side of Featherstone mainly on the** A460 Cannock Road	High*	Worsening of the NO_2 annual mean concentration experienced at some properties, but below national air quality objective levels (not significant)	Potentially adverse effects (not significant)	Significant adverse effects are anticipated	Significant adverse effects are anticipated **(receptors on the A460 Cannock Road)**	VP02: Major adverse (significant) **(receptors on the A460 Cannock Road)**	No additional mitigation has been identified above the measures as outlined within the OEMP [TR010054/APP/6.11].	There is likely to be temporary moderate adverse (significant) combined effects on these properties, as a result of construction noise, vibration and visual impacts. The visual impacts only would remain significant following construction.

4.11.4 The following text which was added to the ES in AS-059/6.1, following the review of updated methodology LA 111: Noise and vibration and LA105: Air quality. This text would sit between paragraphs 15.5.7 and 15.5.8 and would require the following amendments:

"Properties located along the ~~section of~~ A460 (Featherstone) which is modified by the Scheme are anticipated to experience moderate adverse (significant) combined effects as a result of noise, vibration ~~(A460 only)~~ and visual impacts. This is a temporary effect on receptors of high value."

4.11.5 No further alterations are required to the construction assessment.

Operation

4.11.6 The following minor amendments are required to Table 15.5 of the ES.

Table 4.16: Changes to Table 15.5, Summary of potential combined impacts upon a single receptor (operation)

Receptor	Value	Potential combined impacts					Mitigation Air Quality	Residual (cumulative) effect
		Air Quality	Dust	Noise	Vibration	Visual		
Residential receptors on Hilton Lane (west of the Scheme)	High *	Small increase in Annual Mean NO_2 for properties located closest to the Scheme, with small decreases for properties located within close proximity to the A460 Cannock Road. In addition, small improvements in PM_{10} (not significant).	N/A	Moderate~~/ minor~~ increase in noise (significant) for five properties only.	N/A	VP07: Negligible (not significant)	No additional mitigation has been identified above the measures as outlined within the OEMP [TR010054/APP/6.11].	Five receptors close to the Scheme are likely experience both minor changes in NO_2 concentrations and **significant** noise increases. Combined effects would be noteworthy, but unlikely to be significant. Slight adverse (not significant). For other properties, there would not likely be any significant combined effects – Neutral.
Residential receptors on the A460 Cannock Road, Featherston	High*	Large decreases in Annual Mean NO_2 Concentration, for properties off the A460 in	N/A	Generally not significant, however, ~~32~~ **37** residential properties close to the	N/A	VP 02: Year 1: Major adverse (significant) Year 15: Moderate	No additional mitigation has been identified above the measures as outlined within the OEMP [TR010054/APP/6.11].	Although significant beneficial effects have been identified, it cannot be assumed that a significant beneficial effect will outweigh or balance a significant adverse effect.

Receptor	Value	Potential combined impacts					Mitigation Air Quality	Residual (cumulative) effect
		Air Quality	Dust	Noise	Vibration	Visual		
e and Shareshill.		Featherstone. Small to medium decreases for properties in Shareshill (not significant).		existing A460 bypassed by the Scheme will experience significant beneficial effects.		adverse (significant)		Therefore, a worst case approach has been adopted and the moderate adverse (significant) effect remains but only in relation to one environmental aspect (i.e. visual effects). Therefore, this does not constitute a significant combined effect. There are unlikely to be any significant combined effects on these properties that are noteworthy – Neutral.

4.11.7 The following updates to paragraphs 15.5.11 and 15.5.12 to reflect the updates to the assessment in Table 15.5 above.

Paragraph 15.5.11 "On Hilton Lane (west of the Scheme) there is likely to be five properties that experiences both minor changes in NO_2 concentrations and moderate~~/minor~~ noise increases (significant). The combined effects would be noteworthy but are unlikely to be significant (slight adverse), however, significant effects in relation to traffic derived noise would remain (as reported in Chapter 11: Noise and Vibration). For other properties, there would not likely be any significant combined effects."

*Paragraph 15.5.12 "Significant beneficial noise effects have been predicted for ~~32~~ **37** residential properties located close to the existing A460 Cannock Road, Featherstone, and significant adverse visual effects have been predicted for properties located along the same section of this road. However, it cannot be assumed that a significant beneficial effect would outweigh or balance a significant adverse effect. Therefore, a worst case approach has been adopted and a moderate adverse (significant) visual effect (15 years after the completion of the Scheme) remains but only in relation to one environmental aspect (i.e. visual effects). Therefore, this does not constitute a significant combined effect."*

4.12 Summary

4.12.1 The updates to the ES as set out in this report would result in the following alterations to Chapter 16: Summary of the ES[4]. Table 16.1, summary of likely significant effects, row 7, Chapter 11: Noise and Vibration would be altered as follows:

Construction

- *"Significant adverse construction vibration effects for receptors along the section of A460 which is modified by the Scheme, near to the* ***eastern end of*** *Dark Lane* ~~*turning head*~~*, along Hilton Lane (east and west of the Scheme) and at Brookfield Farm.*
- *Significant adverse construction noise effect at the closest receptors to the construction works in the vicinity of the tie in to the existing A460,* ***the south-east and east side of Featherstone closest to the M54 Junction 1 closure works****, Dark Lane/****Park Road****, Hilton Lane (east and west of the Scheme) and Brookfield Farm.*
- ***Significant adverse construction traffic noise effects due to re-routing of traffic during the three week closure of the M54 at Junction 1 at the closest receptors to a small number of minor roads with existing low traffic flows, including to the west of Featherstone up to Calf Health to the north, Shareshill, the north-western end of Hilton Lane, the north and north-east edge of Wolverhampton and to the west of Wolverhampton.****"*

Operation

- *"Significant adverse, short-term effect on five residential properties located to the west of the Scheme on Hilton Lane.*
- *Significant adverse, short-term effect on one property at Brookfield Farm.*
- *Significant beneficial, short-term effect on* ~~*32*~~***37*** *properties close to* ~~*on*~~ *the existing A460 bypassed by the Scheme.*
- *Significant beneficial, short-term effect on 11 residential properties located on Old Stafford Road."*

4.12.2 The updates to the ES as set out in this technical note would result in the following alterations to Chapter 16: Summary of the ES. Table 16.1, summary of likely significant effects, row 11, Chapter 15: Cumulative Effects would be altered as follows:

- *"No significant cumulative effects as a result of other developments in the area.*
- *Temporary moderate adverse combined effect at residential receptors on Park Road and Dark Lane (closest properties to the* ~~*Scheme*~~ ***construction works****), Hilton Lane (east and west of the Scheme),* ~~*and*~~ *Brookfield Farm* ***and the south-east and east side of Featherstone mainly on the A460 Cannock Road****."*

[4] The text altered takes into account the amendments to this table set out in AS-059/8.2 'DMRB Updates and the Impact on the DCO Application', Section 3.12, which summarised the changes to significant environmental effects resulting from the updated methodology for the air quality and noise and vibration assessment as set out in the DMRB LA105 and LA111.

5 Alterations to other environmental application documents

5.1 Non-Technical Summary

5.1.1 The following alterations to the text capture the updates required under the summary of construction and operational assessment reported in Chapter 12 and the summary of likely significant residual effects reported in Table 17.1 of the Non-Technical Summary [APP-211/6.4]:

Construction

- *"Temporary significant adverse construction vibration effects are anticipated at the closest properties to the construction works along the section of A460 which is modified by the Scheme, in the vicinity* ***of the eastern end of*** *Dark Lane, Hilton Lane (east and west of the Scheme) and Brookfield Farm.*
- *Temporary significant adverse construction noise effects are anticipated at the closest properties to the construction works in the vicinity of the tie in to the existing A460,* ***the south-east and east side of Featherstone closest to the M54 junction 1 closure works****, Dark Lane/****Park Road****, Hilton Lane (east and west of the Scheme) and Brookfield Farm.*
- ***Temporary significant adverse construction traffic noise effects due to re-routing of traffic during the three week closure of the M54 at junction 1 at the closest receptors to a small number of minor roads with existing low traffic flows, including to the west of Featherstone up to Calf Health to the north, Shareshill, the north-western end of Hilton Lane, the north/north-east edge of Wolverhampton and to the west of Wolverhampton."***

5.1.2 No further changes to the Non-Technical Summary [APP-211/ 6.4] are required.

5.2 Habitats Regulation Assessment

5.2.1 The design changes would not change the findings of the Habitats Regulation Assessment: No Significant Effects Report [AS-035/6.9] as both Special Areas of Conservation remain scoped out of further assessment due to the distance of these sites from the Scheme and the ARN.

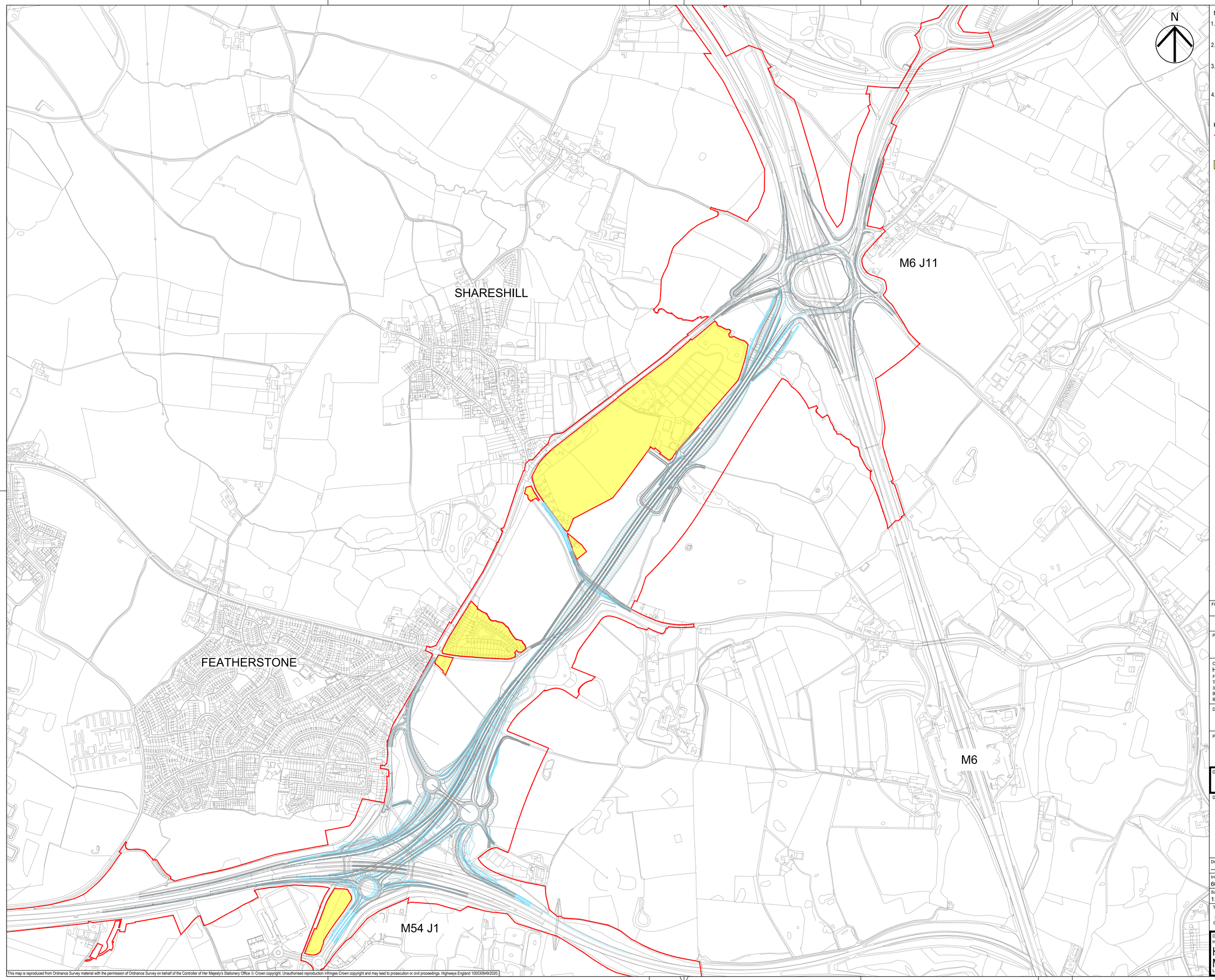
5.3 Outline Environmental Management Plan

5.3.1 The Outline Environmental Management Plan (OEMP) has been revised and a new version (Version 3) submitted to the Planning Inspectorate with this report. The design changes would result in a number of minor amendments to the Record of Environmental Actions and Commitments (REAC) tables as set out in Table 5.1. Plate 1.3 which illustrates the indicative construction programme has also been updated to reflect the six-month reduction in construction programme.

5.3.2 Version 3 of the OEMP also includes a number of alterations in response to queries raised in Written Questions and ongoing consultation. These changes are not summarised in this document.

Table 5.1 Changes to Table 3.4 of the OEMP as a Result of Scheme Changes

Ref	Action/ Commitment (Column 3)	Assumption on which the action is based (Column 6)
D- BIO9	**Great crested newt habitat:** Provision of replacement pond habitat at a ratio of 2:1 for those **ponds found to support populations of GCN, which would be** lost as a direct result of the Scheme **and replaced at a 1:1 ratio for those which do not support GCN**. Provision of species rich grassland and hedgerows which will provide suitable terrestrial habitat for great crested newts. **Monitoring:** Monitoring as per Natural England licence for great crested newts and to assess the success of habitat establishment for foraging and commuting GCN.	Assessment in the ES assumes three great crested newt ponds would be lost.
D-BIO11	**Ancient woodland compensation:** Ancient woodland compensation planting shall be provided adjacent to an existing area of ancient woodland (Brookfield Farm SBI and LWS) at a ratio of 7:1 **(by area) for those areas of ancient woodland lost during the construction of the Scheme.** **Ancient woodland compensation planting shall be provided adjacent to an existing area of ancient woodland (Brookfield Farm SBI and LWS) at a ratio of 1:1 (by area) for those areas of ancient woodland for which a significant adverse effect is anticipated as a result of increases in nitrogen deposition during the operation of the Scheme.** In combination with the compensatory planting, conservation led management of both ancient woodlands (Oxdon Leasow (Whitgreave's Wood) and the area within Brookfield Farm SBI and LWS) would seek to develop and improve upon the woodland structure, enhancement measures would include selective thinning. **Monitoring:** Monitoring undertaken as required by Natural England.	ES assumes loss of **0.35 ha of ancient woodland during construction and a significant adverse effect on 0.87 ha of ancient woodland as a result of increases in nitrogen deposition. This would require planting of (2.44 ha + 0,87 ha) 3.31** ~~3.39 ha~~ of ~~ancient~~ woodland **to provide compensation.**
D-BIO12	**Designated sites:** New woodland planting, new standing water habitats~~, new marshy and wet grassland,~~ and species-rich grassland to be created to mitigate the loss of habitat at Lower Pool LWS and SBI and Brook Field Farm LWS and SBI sites. The created woodland would be managed to have a variety in structure as well as abundant standing and fallen deadwood and hedgerows would be subject to relatively infrequent, rotational management to maximise biodiversity.	The ES assumes replacement habitat provided in line with the Environmental Masterplans Figure 2.1 to 2.7 [TR010054/APP/6.2]



NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DOCUMENTATION.
2. DO NOT SCALE FROM THIS DRAWING, USE ONLY PRINTED DIMENSIONS.
3. ALL DIMENSIONS IN MILLIMETRES, ALL CHAINAGES, LEVELS AND COORDINATES ARE IN METRES UNLESS DEFINED OTHERWISE.
4. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE PROJECT HEALTH & SAFETY FILE FOR ANY IDENTIFIED POTENTIAL RISKS.

KEY

- LIMITS OF LAND TO BE ACQUIRED OR USED PERMANENTLY OR TEMPORARILY (THE ORDER LIMITS)
- LAND NOT INCLUDED WITHIN THE ORDER LIMITS
- SCHEME DESIGN JAN 2020
- DESIGN CHANGES OCT 2020

Revision Details	By / Check	Date	Suffix
FIRST ISSUE		30/09/20	P01.1

Purpose of issue

DCO APPLICATION

Client

Highways England
Floor 5
Two Colmore Square
38 Colmore Circus
Birmingham
B4 6BN

Development Consent Order Number

TR010054

Project Title

M54 to M6 Link Road

Development Consent Order Drawing Number

TR010054

Drawing Title

FIGURE 1:
DESIGN COMPARISON

Designed	Drawn	Checked	Approved	Date
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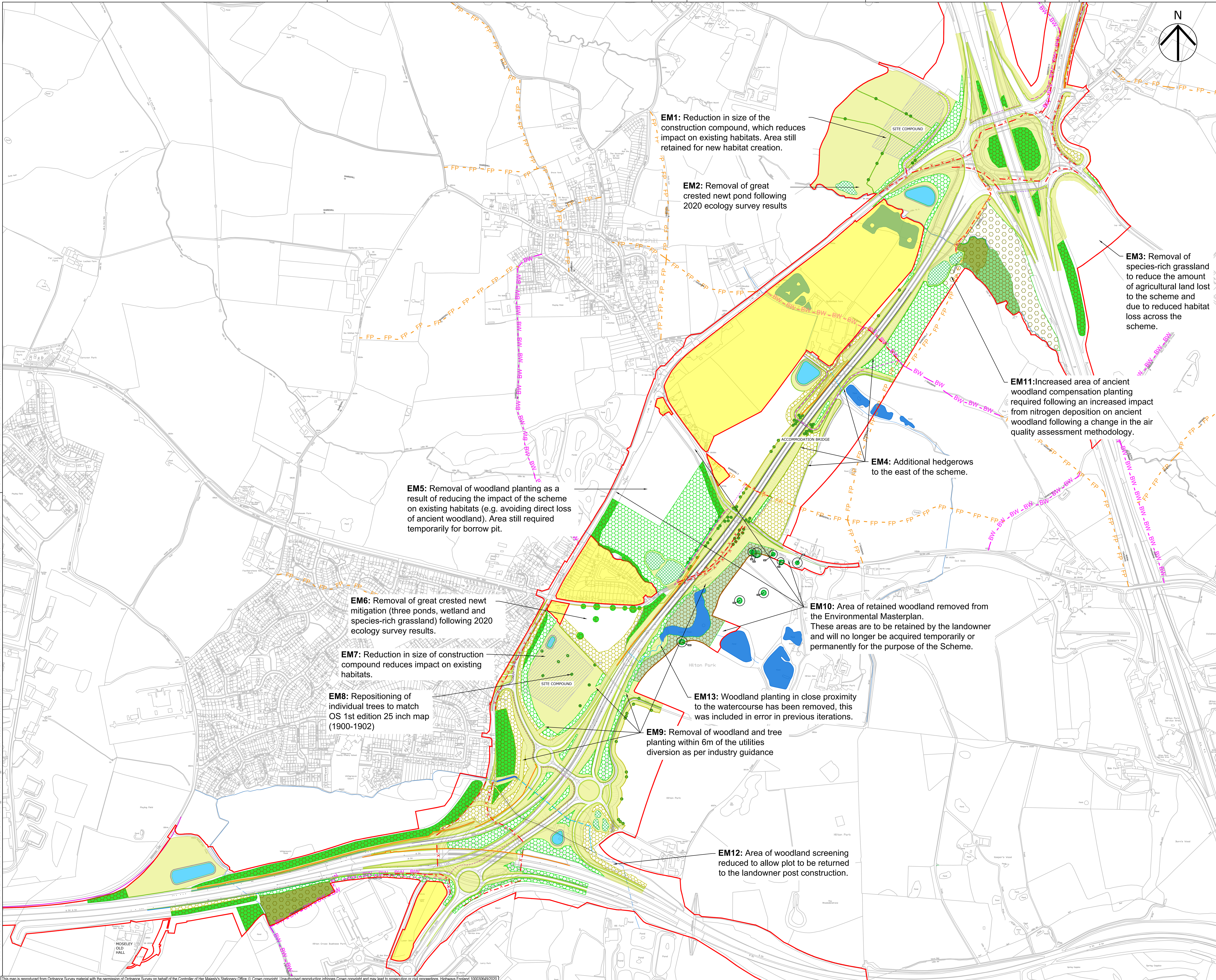
Internal Project No.	Suitability
60536736	S0
Scale @ A1	Zone
1:2000H/1:2000V	Highways General

Drawing Number

Highways England PIN - Originator - Volume
HE514465 - ACM - HGN -
Location - Type - Role - Number
M54_SW_PR_Z - DR - CH - 1018

Rev P01



SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION BOX

IT IS ASSUMED THAT ALL WORKS ON THIS DRAWING WILL BE CARRIED OUT BY A COMPETENT CONTRACTOR WORKING, WHERE APPROPRIATE, TO AN APPROPRIATE METHOD STATEMENT.

THIS DRAWING IS TO BE USED ONLY FOR THE PURPOSE OF ISSUE THAT IT WAS ISSUED FOR AND IS SUBJECT TO AMENDMENT.

EXCEPTIONAL RISKS RELATING TO THE WORKS ASSOCIATED WITH THIS DRAWING ARE IDENTIFIED BELOW.

CONSTRUCTION

MAINTENANCE / OPERATION / DECOMMISSIONING / DEMOLITION

Legend

- The Scheme
- Order limits
- Proposed site compound location
- Existing woodland for retention
- Existing woodland for retention and enhancement
- Existing ancient woodland for retention and enhancement
- Veteran trees
- Existing ponds
- Existing watercourse - open (subject to enhancements)
- Existing watercourse - culvert
- Existing PRoW - footpath
- Existing PRoW - bridleway

Proposed Mitigation

- Proposed ancient woodland compensation woodland - EFD
- Proposed species rich grassland (LE1.3) - EFB / EFD
- Proposed amenity grassland (LE1.1) - EFB
- Proposed woodland (LE2.1) - EFB / EFD
- Proposed woodland (LE2.1) - EFA
- Proposed native species hedgerow (LE4.3) - EFB / EFD
- Proposed native species hedgerow (LE4.3) - EFA
- Proposed individual trees (LE5.1) - EFB
- False cutting - EFA / EFG
- Existing watercourse - diverted - EFH
- Proposed drainage ponds EFH
- Diverted watercourse - culvert - EFH
- Proposed ditch - EFH
- Proposed noise barrier - EFG
- PRoW / footway removal
- Proposed PRoW - Footpath
- Proposed PRoW - Bridleway
- Proposed shared footpath / cycleway

Ecology

- Proposed area for ecology pond - EFD
- Proposed mammal tunnels - EFD

Planned Environmental Objectives

- EFA Visual screening
- EFB Landscape integration
- EFD Nature conservation and biodiversity
- EFH Water quality
- EFG Auditory amenity

Any areas of white would be returned to their current state post construction if they are disturbed during construction

Revision Details	By / Check	Date	Suffix
Updates following revision to permanent land take	RW / AS	28.09.2020	P15
Updates following revised noise barrier locations	RW / AS	10.09.2020	P14

Purpose of issue

DCO SUBMISSION

Client
Highways England
Floor 5
Two Colmore Square
38 Colmore Circus
Birmingham
B4 6BN

Development Consent Order Number

TR010054

Project Title

M54 to M6 Link Road

Drawing Title

FIGURE 2 CHANGES TO THE ENVIRONMENTAL MASTERPLAN

Designed	Drawn	Checked	Approved	Date
NW	LB	RW	TP	28.09.2020

Internal Project No. 60536736 — Suitability S8

Scale @ A1 1:5000 — Zone Highways General

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Drawing Number
Highways England PIN HE514465 - Originator ACM - Volume ELS - Location M54 - Type SW - Role R - Number 0001

Rev P15

Plot Date : 05 October 2020 14:50:36
File Name: \\NA.AECOMNET.COM\LFS\EMEA\CHESTERFIELD-UKCBY1\LEGACY\WP\2\CH_SHARED\CH_LANDSCAPE\PROJECTS\60518638-M54-M6 LINK\8.0 - TECHNICAL\8.1 - DWGS\ENVIRONMENTAL MITIGATION\ENVIRONMENTAL MITIGATION P15\M54 ENVIRONMENTAL MASTERPLAN P15 20200928