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M4 Corridor around Newport

Environmental Statement Supplement

Volume 1: Main Text

Welsh Government

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Environmental Statement Supplement

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Contents

Glossary

AADT:	Annual Average Daily Traffic
ALC:	Agricultural Land Classification
BoCC:	Birds of Conservation Concern
CHMP:	Cultural Heritage Management Plan
CIEEM:	Chartered Institute of Ecology and Environmental Management
CL:	Contaminated Land
Defra:	Department for Environment, Food and Rural Affairs
DMRB:	Design Manual for Roads and Bridges
EIA:	Environmental Impact Assessment
EPA:	Environmental Protection Act
ES:	Environmental Statement
ESS:	Environmental Statement Supplement
GCR:	Geological Conservation Review
HGV:	Heavy Goods Vehicle
HLCA:	Historic Landscape Character Area
IAQM:	Institute of Air Quality Management
IDD:	Internal Drainage District
IEMA:	Institute of Environmental Management and Assessment
LANDMAP:	Landscape Assessment and Decision Making Process
M4CaN:	M4 Corridor around Newport
MTAN:	Minerals Technical Advice Note
NCN:	National Cycle Route
NERC:	Natural Environment and Rural Communities
NMU:	Non-Motorised User
NNR:	National Nature Reserve
NRW:	Natural Resources Wales
NSR:	Noise Sensitive Receptor
NTS:	Non-Technical Summary
OPRA:	Operational Risk Assessment
PPW:	Planning Policy Wales
RIGS:	Regionally Important Geodiversity Site
RSPB:	Royal Society for the Protection of Birds
SEWBRC:	South East Wales Biological Records Centre
SINC:	Site of Interest for Nature Conservation
SPA:	Special Protection Area
SSSI:	Site of Special Scientific Interest
WLGA:	Welsh Local Government Agency
WTA:	Water Treatment Area

Non-Technical Summary

1. Draft Orders for the proposed M4 Corridor around Newport (M4CaN) were published by Welsh Government in March 2016, together with an Environmental Statement (ES) and associated reports.

2. M4CaN (referred to in this document as 'the Scheme') includes a proposed new section of three lane motorway between Castleton (Junction 29 of the existing M4) and Magor (Junction 23 of the existing M4) to the south of Newport in South Wales, together with a number of Complementary Measures on the existing M4 between the same junctions.

3. Since March 2016, further information pertinent to the Scheme has become available and modifications to the design have been made. These, together with errata and a number of clarifications, are reported in an Environmental Statement Supplement (ESS) which should be read alongside the published March 2016 ES. This document is the summary of the ESS.

4. In common with the March 2016 ES, the ESS comprises three volumes: Volume 1 – text; Volume 2 – figures; and Volume 3 – appendices. Volume 1 of the ESS is divided into four parts, A – D.

5. Part A is concerned with errata and sets out factual errors, inconsistencies and omissions. These relate primarily to baseline information.

6. Part B provides clarification with respect to cultural heritage survey work and proposed mitigation, the marine historic environment, aspects of the landscape and visual assessment during construction, the impact on Barecroft Fields which is part of the Magor Marsh nature reserve, and the impact during construction on the Cardiff to Newport cycleway (NR88).

7. Part C provides updated and/or additional information that has become available since the publication of the March 2016 ES. It includes updates to the Drainage Strategy and Reen Mitigation Strategy provided as appendices to Chapter 2 of the March 2016 ES and updates the status of some recent Welsh legislation.

8. With regard to air quality Part C updates some technical and policy guidance, and provides more recent air quality data and further assessment of air quality during construction. None of the updates materially alter the assessment and conclusions of the March 2016 ES with respect to air quality.

9. With regard to cultural heritage additional survey information regarding the Pye Corner Barrage Balloon Tethers (HB087) is provided. In light of that information the significance of effect has been assessed as large adverse, which would be a significant effect. Additional non-designated Historic Landscape Character Areas (HLCAs) are also identified, and corresponding amendments and additions to the text provided in Chapter 8 of the March 2016 ES are made. Further photomontages showing additional views of the Scheme are included.

10. Part C also acknowledges that Natural Resources Wales (NRW) have updated their guidance for the use and interpretation of LANDMAP.

11. With regard to ecology and nature conservation Part C provides updated guidance produced by the Chartered Institute of Ecology and Environmental Management (CIEEM), additional information relating to Sites of Special Scientific Interest (SSSIs)

provided by NRW, and additional environmental information arising from new surveys and desk based research.

12. The additional ecological survey reports include those for the Wintering Bird Survey 2015 - 2016, Breeding Bird Survey 2016, Great Crested Newt Survey 2016 and Bat Hibernation Roost Survey 2016. Interim statements with regard to the Dormouse Survey 2016 and the Bat Emergence Survey 2016 are also included. None of the additional survey information materially alters the assessment and conclusions of the March 2016 ES with respect to ecology and nature conservation.

13. Part C also includes updates to the Environmental Permitting Regulations and updates to Appendix 11.1 of the March 2016 ES and its supporting Contaminated Land (CL) annexes.

14. Under All Travellers Part C provides a summary of the Active Travel Action Plan for Wales which was published in February 2016. Part C also provides the results of the Agricultural Land Classification (ALC) survey of a plot of agricultural land not surveyed originally.

15. With regard to the water environment Part C provides water quality data from further rounds of quarterly surface water monitoring, time series data for groundwater levels in shallow and deep aquifers below Newport Docks together with other additional hydrogeological data and groundwater measurements. An update to the Flood Consequences Assessment (FCA, ES Appendix 16.1) is also provided. None of the additional data materially alter the assessment and conclusions of the March 2016 ES with respect to the water environment.

16. Appendix 17.2 (Planning Applications (for cumulative assessment)) and Appendix 18.1 (Register of Environmental Commitments) are also updated.

17. Part D is concerned with two matters. The first describes and assesses modifications to the Scheme design since the publication of the draft Orders and the March 2016 ES that require either a supplementary draft Order or a modification to an existing Order. The second describes modifications to the Environmental Management Plans.

18. Significant modifications to the Scheme design are described at the Magor Interchange and at Docks Way Junction. Minor modifications are described for the Glan Llyn Junction and between Junctions 23 and 23A where the proposed dual carriageway is lowered. Minor local modifications are also described.

19. At Magor Interchange Bencroft Lane is realigned further eastwards. This requires a supplementary draft Order, but has the consequential benefit of lowering the interchange and the westbound off slip. The outfall of Water Treatment Area 12B is also redesigned.

20. At Docks Way Junction, whilst there would be no change to the amount of land required, the layout, horizontal and vertical alignment of the junction and the link road have been revised. In addition the reinforced earth embankment between the junction roundabout and the western approach to the Usk Crossing has been replaced by a series of piers.

21. It is anticipated that a further supplement to the March 2016 ES will be published in November 2016 which will include reporting of the remaining two ecological surveys, a Navigation Risk Assessment and updates to the Buildability Report (ES Appendix

3.1) and the Pre-Construction Environmental Management Plan (Pre-CEMP) (ES Appendix 3.2).

22. Copies of the Supplementary Orders, this ES Supplement and Summary, and supporting information are available to view during normal office hours at the locations below.

- Orders Branch, Transport, Department of Economy Science and Transport, Welsh Government, Cathays Park, Cardiff, CF10 3NQ.
- Newport City Council, Civic Centre, Godfrey Road, Newport, NP20 4UR.
- Monmouthshire County Council, County Hall, Rhadyr, Usk, NP15 1GA.
- Monmouthshire County Council, Innovation House, Wales 1 Business Park, Magor, Monmouthshire, NP26 3DG.
- Newport Central Library, John Frost Square, Newport, NP20 1PA.

23. Further copies of the ES Supplement Summary can be obtained free of charge from the Welsh Government in Cardiff at the following address.

Orders Branch
Transport
Department of Economy, Science and Transport
Welsh Government
Cathays Park, Cardiff
CF10 3NQ.

24. The ES Supplement and Summary (together with the full March 2016 ES) are available to view and download from the Welsh Government website:

http://www.wales.gov.uk/m4newport

25. Electronic copies of the March 2016 ES and ES Supplement (on DVD) can be purchased from the above Welsh Government address at a cost of £20 (including postage and packaging).

26. Paper copies of the March 2016 ES and ES Supplement are also available from the above address, although an administrative charge will be made to cover the cost of copying (price on application).

1 Introduction

1.1 Introduction

1.1.1 M4CaN (referred to in this document as 'the Scheme') includes a proposed new section of three lane motorway between Castleton (Junction 29 of the existing M4) and Magor (Junction 23 of the existing M4) to the south of Newport in South Wales.

1.1.2 The Scheme would also include a range of Complementary Measures. These are measures that would assist in alleviating travel related problems on the existing M4. The measures include reclassification of the existing M4 as a trunk road between Castleton and Magor, relief to Junction 23A with a new M4/M48/B4245 connection and provision of cycle and walking friendly infrastructure. These measures are complementary to the provision of the new section of motorway but would not by themselves alleviate the travel related problems on the existing M4.

1.1.3 The Welsh Government's draft Orders and Environmental Statement for the M4 Corridor around Newport (M4CaN) were published in March 2016. Since the publication of the draft Orders and the March 2016 ES, the detail of the design has continued to be progressed and those potentially affected by the draft Orders have had the opportunity to comment on them.

1.1.4 Supplements and modifications to the draft Orders have been developed by the Welsh Government to be published in September 2016 for the following reasons.

- Amendments to the details of parties in the Schedules to the Compulsory Purchase Order following receipt of further information on title holders, lessees and interested parties.
- Amendments to the Scheme further to matters raised by responses received to the draft Orders.

1.1.5 This document is Volume 1 of a supplement to the March 2016 ES (referred to as the ES Supplement) and should be read alongside the published ES. This ES Supplement is provided voluntarily to give greater clarity to environmental aspects of the Scheme by correcting minor factual errors and by providing new information and/or data.

1.2 Scope and Content of the ES Supplement

1.2.1 This ES Supplement is divided into four parts, Part A to Part D. Part A identifies and corrects, by ES chapter, a number of minor factual errors, inconsistencies and omissions. These relate primarily to baseline information. Part B provides points of clarification in relation to the text provided within the ES. None of these corrections or clarifications alter the conclusions or the significance of effects set out in the ES.

1.2.2 Part C introduces new supplementary information that has become available since the publication of the March 2016 ES, including the findings of additional survey work. Details of modifications to the Scheme design since publication of the March 2016 ES are provided and the effects considered in Part D. A non-

technical summary of this ES Supplement is provided at the beginning of this document and is also available as a separate bilingual document.

1.2.3 Table 1.1 sets out the structure of this ES Supplement. This volume of the ES Supplement (Volume 1) includes the main text. Figures and appendices to accompany the text are provided separately in Volumes 2 and 3 respectively. Figures and appendices within this ES Supplement have been referenced as follows.

- New figures or appendices (not previously forming part of the March 2016 ES) are numbered according to their ES chapter number and then in numerical order e.g. 10.1, 10.2 etc. To distinguish such new documents from the figures and appendices published in the March 2016 ES, these new figures and appendices are pre-fixed with an 'S'.
- Figures or appendices that formed part of the March 2016 ES but have been updated or replaced retain their previous ES figure/appendix number but are pre-fixed with an 'R' to distinguish them from the previous version.

1.2.4 Appendix S1.1 sets out which parts of the March 2016 ES have been updated.

ES Supplement Table 1.1: Structure of the ES Supplement

Structure of ES Supplement	
Volume 1: Text	Glossary
	Non- Technical Summary
Part A	Errata: Sets out factual errors, inconsistencies and omissions. These relate primarily to baseline information.
Part B	Clarifications: Sets out clarifications in relation to the text provided in the March 2016 ES.
Part C	Additional information: New supplementary information that has become available since the publication of the March 2016 ES, including the findings of additional survey work.
Part D	Design modifications: Details of changes to the Scheme since publication of the March 2016 ES.
Volume 2: Figures	
Updated and new figures and drawings to accompany the text.	
Volume 3: Appendices	
Updated and new specialist reports forming technical appendices to the text.	

1.3 The Assessment Team

1.3.1 The Welsh Government awarded a Professional Services Contract for the Scheme development and environmental surveys, including publication of the March 2016 ES and up to and including any Public Local Inquiry. The contract was awarded to a Joint Venture of Costain, Vinci and Taylor Woodrow with a consultant joint venture of Arup and Atkins, supported by environmental sub-consultant RPS.

1.3.2 The Environmental Impact Assessment (EIA) process has been managed by RPS, taking into account information provided by the Welsh Government, design and consultant team. RPS is a registrant of the Institute of Environmental Management and Assessment (IEMA) Quality Mark. Details of the EIA project team are provided in Table 1.2.

ES Supplement Table 1.2: EIA Topic Specialists

Topic	Main Author/Contributor
EIA project management	RPS
Air Quality	Arup (part of Arup Atkins Joint Venture)
Cultural Heritage	RPS
Landscape and Visual Effects	Atkins (part of Arup Atkins Joint Venture)
Ecology and Nature Conservation	RPS
Geology and Soils	RPS
Materials	RPS
Noise and Vibration	RPS
All Travellers	RPS
Community and Private Assets	RPS
Road Drainage and the Water Environment	RPS
Assessment of Cumulative Effects and Inter-relationships	RPS
Environmental Management	RPS

1.4 Publication of the ES Supplement

1.4.1 This ES Supplement is submitted to accompany the publication of Supplementary Orders for the Scheme.

1.4.2 Copies of the Supplementary Orders, this ES Supplement and supporting information are available to view during normal office hours at the locations below.

- Orders Branch, Transport, Department of Economy Science and Transport, Welsh Government, Cathays Park, Cardiff, CF10 3NQ.
- Newport City Council, Civic Centre, Godfrey Road, Newport, NP20 4UR.
- Monmouthshire County Council, County Hall, Rhadyr, Usk, NP15 1GA.
- Monmouthshire County Council, Innovation House, Wales 1 Business Park, Magor, Monmouthshire, NP26 3DG.
- Newport Central Library, John Frost Square, Newport, NP20 1PA.

1.4.3 In addition, copies of the draft Orders, the March 2016 ES and associated reporting published in March 2016 are available in the same locations.

1.4.4 Further copies of the Non-Technical Summary (which is available as a separate bilingual document) can be obtained free of charge from the Welsh Government in Cardiff at the following address.

Orders Branch
Transport
Department of Economy, Science and Transport
Welsh Government
Cathays Park, Cardiff
CF10 3NQ.

1.4.5 The full March 2016 ES and ES Supplement are available to view and download from the Welsh Government website.

http://www.wales.gov.uk/m4newport

1.4.6 Electronic copies of the March 2016 ES and ES Supplement (on DVD) can be purchased from the above Welsh Government address at a cost of £20 (including postage and packaging).

1.4.7 Paper copies of the March 2016 ES and ES Supplement are also available from the above address, although an administrative charge will be made to cover the cost of copying (price on application).

1.5 Next Steps

1.5.1 It is anticipated that a further supplement to the March 2016 ES will be published in November 2016 which will include the following.

- Reporting of the remaining ecological surveys (dormouse and bat emergence surveys).
- A Navigation Risk Assessment.
- Updates to the Buildability Report (Appendix 3.1 of the March 2016 ES).
- Updates to the Pre-Construction Environmental Management Plan (Pre-CEMP) (Appendix 3.2 of the March 2016 ES).

1.5.2 Welsh Government plan to hold a Public Local Inquiry commencing in November 2016. Such Inquiries are held before an independent Inspector who would hear and consider the evidence both for and against the published Scheme and subsequently report their findings and recommendations to the Welsh Ministers. The Welsh Ministers would consider all issues, including any new information arising, before deciding whether to proceed with the Scheme and, if so, make the Orders with or without modification.

1.5.3 Subject to the above process, the approximate key dates for progressing the M4 Corridor around Newport are as follows.

- Start of Public Local Inquiry: November 2016.
- Start of construction: Spring 2018.
- Completion of construction of new section of motorway: Autumn 2021.
- Completion of work associated with reclassification of existing motorway: Spring 2022.

2 Part A: Errata

2.1.1 The following errata have been identified in relation to the March 2016 ES.

Non-Technical Summary

NTS, Page 4

2.1.2 The NTS states that 'Newport has four out of seven of its Air Quality Management Areas influenced by the M4'. It should be noted that Newport has nine Air Quality Management Areas in total, although seven are within the vicinity of the Scheme. It is correct that four of these are adjacent to the existing M4.

NTS, Page 6

2.1.3 The NTS states that 'Out of seven Air Quality Management Areas designated by Newport City Council, four are influenced by the existing M4'. It should be noted that Newport has nine Air Quality Management Areas in total, although seven are within the vicinity of the Scheme. It is correct that four of these are adjacent to the existing M4.

NTS, Cultural Heritage (Pages 27-33)

2.1.4 The NTS summarises the likely significant effects of the Scheme on heritage receptors. It is noted that, a number of additional effects are reported in the ES chapter (which were not reported in the NTS). These include significant effects on the following during construction.

- Llanfihangel Conservation Area.
- Effect on shrunken medieval settlement at Llanfihangel.
- Effect on moated site at Rush Wall/North Row.
- Effect on complex of earthworks at Pont-y-Cwcw Reen.

2.1.5 In addition, a significant effect on the Llanfihangel Conservation Area during operation of the proposed new section of motorway is reported in the ES chapter but was not included within the NTS text.

NTS, Geology and Soils (Page 40)

2.1.6 The NTS states that 'with the mitigation measures proposed the only significant effect would be on the sensitive surface waters of the Gwent Levels where a potentially significant effect is predicted during construction.' It should be noted that the potential for a significant effect does not apply generally but refers only to the site CL-26. It is also noted that further ground investigation has been undertaken since publication of the ES and this is reported within this ES Supplement.

Chapter 2: Scheme Description

ES Volume 1 Paragraph 2.3.57

2.1.7 Should read: 'In addition to these existing resources, five new public bridleways would be created as part of the proposed new section of motorway (four of these

are described in the section above). These would also be available for use by cyclists. The additional bridleway would run eastwards along Rush Wall from North Row to the south of the new carriageway, linking to the existing alignment of Barecroft Common (Figures R2.4 and R2.6).'

ES Volume 1 Paragraph 2.3.102

2.1.8 Should read: 'The proposed new section of motorway would cross reens and field ditches at a series of locations, which would be infilled. The estimated length of reens that would be infilled and culverted is approximately 2,755 metres. The estimated length of field ditch crossings that would be infilled as part of the Scheme is approximately 9,373 metres. Details are provided in Appendix 2.3 of the March 2016 ES and Appendix S2.1 of this ES Supplement.'

ES Volume 1 Paragraph 2.3.97

2.1.9 The subheading 'Reen Network' should be at the same level as the heading Highway Drainage on page 2-24 (Heading 3). As a consequence, sub-headings in the sections below the 'Reen Network' heading should be one level higher than shown.

ES Volume 2, Figure 2.4

2.1.10 Minor corrections to the labelling have been made to the General Arrangement Plans provided at Figure 2.4 of the March 2016 ES. Details are provided at Appendix S2.3. In addition, as number of amendments have been made to accommodate additional information arising and the modifications to the design of the proposed new section of motorway. Therefore, a replacement Figure 2.4 is provided at Figure R2.4.

ES Volume 2, Figure 2.5

2.1.11 Minor corrections to labelling have been made to the Highway Drainage and Reen Mitigation Plans provided at Figure 2.5 of the March 2016 ES. Details are provided at Appendix S2.3. In addition, as number of amendments have been made to accommodate additional information arising and the modifications to the design of the proposed new section of motorway. Therefore, a replacement Figure 2.5 is provided at Figure R2.5.

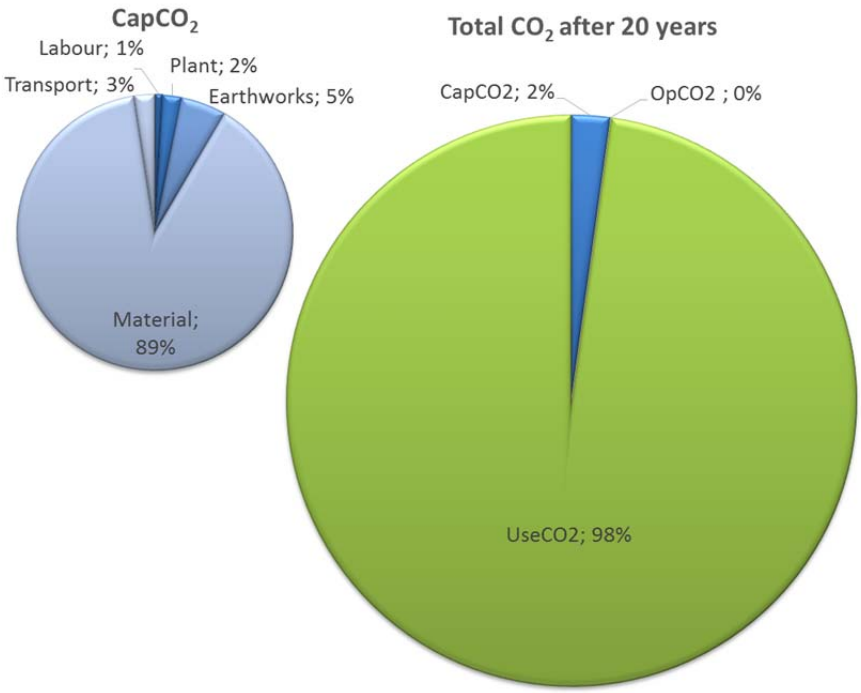
ES Volume 2, Figure 2.6

2.1.12 Minor corrections have been made to the Environmental Masterplans provided at Figure 2.6 of the March 2016 ES. In addition, as number of amendments have been made to accommodate additional information arising and the modifications to the design of the proposed new section of motorway. Therefore, a replacement Figure 2.6 is provided at Figure R2.6.

ES Volume 3 Appendix 2.4

2.1.13 Figure 3 was omitted from Appendix 2.4. This is provided below.

Appendix 2.4 Figure 3: Cumulative Carbon Emissions for the Scheme after 20 years (5 years Construction and 15 years Operation – Year 2037)



Chapter 3: Scheme Construction

ES Volume 1 Paragraph 3.3.11

2.1.14 Third bullet point should read: 'Protection measures in line with a Dust Management Plan'.

ES Volume 3 Appendix 3.2, Annex A (Air Quality)

2.1.15 Second reference should be replaced with: 'Institute of Air Quality Management (IAQM) (2014) Guidance on the Assessment of Dust for Demolition and Construction'.

Chapter 6: Legislative and Policy Context

ES Volume 1 Paragraph 6.5.2

2.1.16 Should read: 'The Newport Local Development Plan 2011-2026'.

Chapter 7: Air Quality

ES Volume 1 Paragraph 7.7.12

2.1.17 Should read: 'The proposed construction work would require the demolition of both buildings and structures. Twelve residential properties would be demolished as part of the Scheme'.

ES Volume 1 Paragraphs 7.7.35 – 7.7.41

2.1.18 The assessment of construction traffic included in the March 2016 ES assessed only vehicle movements associated with the movements of material across the local road network and did not include staff movement to and from construction compounds. It also did not include vehicle movements along the haul road. The assessment has been updated to reflect staff vehicles and the movement of vehicles along the haul road. The results of this are provided within this ES Supplement (Part C).

ES Volume 1 Section 7.8

2.1.19 The air quality modelling undertaken for the 'Do Something' (with Scheme) scenario presented within the March 2016 ES did not include the reduction of the reclassified M4 to two lanes in each direction through the existing M4 Junction 28. This aspect of the Scheme would have a minimal effect on modelled pollutant concentrations in the area as vehicles would move slightly further from properties adjacent to the carriageway. At this location, all properties within 200 metres are commercial properties and no residential properties would be affected. Therefore, this would not alter the conclusions set out in the March 2016 ES.

Chapter 8: Cultural Heritage

ES Volume 1 Paragraph 8.6.9

2.1.20 First sentence should read: 'Part of the land at this location would initially be required for topsoil storage during construction and the whole of the archaeological site would subsequently be subject to woodland planting as part of the landscape and ecological mitigation for the Scheme.'

ES Volume 1 Paragraph 8.6.11

2.1.21 First sentence should read: 'Part of the land at this location would be required for the borrowing of stone during construction and the whole of the archaeological site would subsequently be subject to woodland planting as part of the landscape and ecological mitigation for the Scheme'.

Chapter 9: Landscape and Visual Effects

ES Volume 1 Paragraph 9.4.10

2.1.22 Should read: 'This LCA is located between the urban edges of Newport to the east and Cardiff to the west. It extends south to the A48, St Mellons Golf Club and the Parc Golf Club. To the north, it extends into Bassaleg and the River Rhymney.'

ES Volume 1 Paragraph 9.4.13

2.1.23 First sentence should read: 'The field sizes are predominantly medium sized, becoming larger as the landscape rises to the north.'

2.1.24 Third sentence should be replaced with: 'An arched pedestrian bridge over the A48 is a distinct feature in the south of the area.'

ES Volume 1 Paragraph 9.4.20

2.1.25 Third sentence should read: 'There is an irregular layout of fields but a large proportion are rectangular in nature, particularly to the west and south.'

ES Volume 1 Paragraph 9.4.44

2.1.26 First sentence should read: 'The landcover is primarily rural with gently rolling large fields, which are mainly pasture and arable.'

ES Volume 1 Section 9.7/9.8

2.1.27 Note that a detailed assessment of impacts on heritage features is provided in Chapter 8 of the ES.

ES Volume 1 Paragraph 9.7.86

2.1.28 First sentence should read: 'Viewpoint 13, Church Lane would experience a negligible magnitude of impact on visual amenity during the construction phase.'

ES Volume 1 Paragraph 9.7.90

2.1.29 Second sentence: After 'Receptors at these locations….' Insert ',which at viewpoint location 25 also includes users of National Cycle Network route 4'.

ES Volume 1 Paragraph 9.7.93

2.1.30 Third sentence: Replace 'horizontal emphasis' with 'vertical emphasis'.

ES Volume 1 Paragraph 9.7.94

2.1.31 Fourth sentence: replace 'These horizontal features…' with 'These vertical features…'

ES Volume 1 Paragraph 9.7.206

2.1.32 Insert the following after the second sentence: 'Residents at Windmill Cottages would also have direct short distance views of the Ifton Quarry haul road and construction traffic moving along this route.'

ES Volume 1 Paragraph 9.7.215

2.1.33 After the third sentence insert the following new sentence: 'A proportion of the golf course would be required for construction of the new road.'

ES Volume 1 Paragraph 9.7.229

2.1.34 First sentence should read: 'Workers at Gwent Eurocentre (Receptor 110) have their views towards the proposed new section of motorway limited by the design of the building and mature vegetation.'

ES Volume 1 Paragraph 9.7.242

2.1.35 At the end of the paragraph add the following sentences: 'PROW receptor group 43 covers users of a route with public access which follows Pencoed Reen. This track forms part of National Cycle Network Route 88. Cyclists using this route

would also be subject to a temporary large adverse significance of effect on their visual amenity for the reasons described above.'

ES Volume 1 Paragraph 9.7.246

2.1.36 Add the following to the end of the paragraph: 'Users of the Wales Coast Path as it follows Lighthouse Road and heads towards the A48 (PRoW group 48) would have glimpsed and intermittent views through vegetation alongside the route to construction of the proposed new section of motorway as it approaches the Ebbw and Usk Bridges and of the bridge construction itself.'

ES Volume 1 Paragraph 9.7.247

2.1.37 Omit the last sentence. Replace with: 'The section of Coast Path that follows Lighthouse Road north of Duffryn Way and links to the A48 via an off-road route also forms part of National Cycle Network Route 4. Cyclists using this route would also be subject to a temporary slight adverse significance of effect on their visual amenity for the reasons described above.'

ES Volume 1 Paragraph 9.7.251

2.1.38 Should be replaced with: 'The section of the Wales Coast Path that runs under the site of the River Usk Crossing is to be temporarily stopped up and diverted through the nearby industrial areas. This would change the visual amenity for users of this path and they would experience a temporary very large adverse significance of effect. This would also affect users of National Cycle Network Route 4, which shares the route of the Coast Path in this area.'

ES Volume 1 Paragraph 9.7.256

2.1.39 'Eyler Pill Reen' should read 'Elver Pill Reen'.

ES Volume 1 Paragraph 9.7.269

2.1.40 Insert after first sentence: 'Receptor group 147 (footpaths 378/22/1, 378/3/1 & 378/5/1) would also have direct and close proximity views of the Ifton Quarry haul road and associated construction traffic. Users would need to cross the haul road as they travel along these routes.'

ES Volume 1 Paragraph 9.7.310

2.1.41 Last sentence should read: 'Immense structures such as supporting piers and precast concrete road sections and the compounds, working areas, large plant and lifting equipment involved would be highly noticeable.'

ES Volume 1 Paragraph 9.7.311

2.1.42 Second sentence should read: 'The construction of the River Usk Crossing and elevated approaches and the associated compounds, working and fabrication areas would dominate views for boat users in this vicinity in much the same way as for receptors on the River Ebbw.'

ES Volume 1 Paragraph 9.8.94

2.1.43 Fourth sentence should read: 'The proposed new section of motorway and the River Usk Crossing would be visible in the middle long distance views as a narrow ribbon of highway across the Levels landscape.'

ES Volume 1 Paragraph 9.8.103

2.1.44 Second sentence should read: 'The close proximity to the route as it runs to the south east of Imperial Park coupled with the extensive removal of woodland as part of construction works means that there would be clear, direct and short range views towards moving traffic, highway infrastructure and the bare earth of newly formed embankments.'

ES Volume 1 Paragraph 9.8.113

2.1.45 Fourth sentence should read: 'Viewpoint 21, PRoW behind Pennard Close would have intermittent views from upper storeys of the houses adjacent to this PRoW of the vertical highway features such as gantries, signage and lighting along with the noise barrier and moving traffic along the carriageway visible above this, particularly where the motorway is raised over the South Wales to London Mainline railway.'

ES Volume 1 Paragraph 9.8.115

2.1.46 After first sentence add: 'This is because significant screen planting would be detrimental in this area due to the open character of the existing landscape.'

ES Volume 1 Paragraph 9.8.117

2.1.47 Second sentence: After 'Receptors at these locations….' Insert ', which at viewpoint location 25 also includes users of National Cycle Network route 4'.

2.1.48 Remove last sentence.

ES Volume 1 Paragraph 9.8.122

2.1.49 Third sentence: Amend '…strong horizontal emphasis…' to '…strong vertical emphasis…'

ES Volume 1 Paragraph 9.8.125

2.1.50 Fourth sentence: replace 'These horizontal features…' with 'These vertical features…'

ES Volume 1 Paragraph 9.8.220

2.1.51 Last sentence - bracketed phrase: Amend to 'three two storey properties - receptors 18, 19 and 20a'.

ES Volume 1 Paragraph 9.8.244

2.1.52 Last sentence: 'averse' should read 'adverse'

ES Volume 1 Paragraph 9.8.290

2.1.53 Eyler Pill Reen' should read 'Elver Pill Reen'.

ES Volume 1 Paragraph 9.8.293

2.1.54 Last sentence should read: 'Therefore they would experience a moderate adverse significance of effect upon their visual amenity in Year 15'.

ES Volume 1 Paragraph 9.8.295

2.1.55 First sentence should read: 'These receptors have the potential to be affected by the presence of the proposed new section of motorway, M48/M4 junction, link roads and associated works to local roads.'

ES Volume 1 Paragraph 9.8.297

2.1.56 End of first sentence: Amend to '… on the northern edges of Magor.'

ES Volume 1 Paragraph 9.8.301

2.1.57 End of first sentence: Amend to '… on the northern edges of Magor.'

ES Volume 1 Paragraph 9.8.303

2.1.58 First sentence should read: 'These receptors have the potential to be affected by the presence of the proposed new section of motorway, M48/M4 junction, link roads and associated works to local roads.'

ES Volume 1 Paragraph 9.8.358

2.1.59 Third sentence: Amend to '…proximity of water treatment area 1…'

2.1.60 At the end of the paragraph add the following sentences: 'PROW receptor group 43 covers users of a route with public access which follows Pencoed Reen. This track forms part of National Cycle Network Route 88. Cyclists using this route would also be subject to a large adverse significance of effect on their visual amenity for the reasons described above.'

ES Volume 1 Paragraph 9.8.360

2.1.61 Delete the words 'the construction phase for'

ES Volume 1 Paragraph 9.8.362

2.1.62 Second sentence should read: 'Although woodland planting around the Castleton Interchange and alongside the proposed new section of motorway would screen and filter the majority of views to the road, traffic and infrastructure, glimpsed views of moving traffic are likely to remain, particularly that associated with the flyover sections and along the top of the largest and steepest embankments'.

ES Volume 1 Paragraph 9.8.365

2.1.63 At the end of the paragraph add the following sentences: 'The section of Coast Path that follows Lighthouse Road north of Duffryn Way and links to the A48 via an off-road route also forms part of National Cycle Network Route 4. Cyclists

using this route would also be subject to a moderate adverse significance of effect on their visual amenity for the reasons described above.'

ES Volume 1 Paragraph 9.8.372

2.1.64 Replace in entirety with the following paragraph: 'Users of the Wales Coast Path as it follows the east bank of the River Usk and heads east away from the river towards Pye Corner on footpath 401/4 (Receptor groups 63 and 64) would have very close proximity views of the proposed new section of motorway including viaduct and bridge sections over industrial areas and the River Usk. The section of the Coast Path at the southern end of Corporation Road and to the south of the Solutia Chemical Works site also forms part of National Cycle Network Route 4. The supporting structures of the elevated sections of route would visually dominate and overshadow most parts of this route. Large sections of the Coast Path and National Cycle Network Route 4 would pass under the proposed new section of motorway several times; under viaduct sections to the south and south west of the Solutia Chemical Works site and under the River Usk Crossing as the Coast Path follows the bank of the River Usk. Visual amenity along these 'underpass' sections has the potential to be very poor and users are predicted to experience a very large adverse significance of effect.'

ES Volume 1 Paragraph 9.8.394

2.1.65 First sentence should read: 'These receptors have the potential to be affected by the presence of the proposed new section of motorway, M48/M4 junction, link roads and associated works to local roads.'

ES Volume 1 Paragraph 9.8.418

2.1.66 Add to end of last sentence '… due to the visually positive and potentially iconic nature of the bridge.'

ES Volume 1 Paragraph 9.15.18

2.1.67 Second sentence, insert: 'measures' after 'complementary'.

Chapter 10: Ecology and Nature Conservation

ES Volume 1 Paragraph 10.4.20

2.1.68 First sentence: 'least duckweed' should read 'rootless duckweed'.

ES Volume 1 Paragraphs 10.4.28, 10.8.12, Table 10.17

2.1.69 The correct name of the SSSI is Rectory Meadow, Rogiet SSSI.

ES Volume 1 Paragraph 10.4.209

2.1.70 A list of scientific names of plants is given with no English names. The English names are:

Alisma lanceolatum	Narrow-leaved water plantain
Butomus umbellatus	Flowering rush
Ceratophyllum demersum	Rigid hornwort

Lemna gibba	Fat duckweed
Potamogeton trichoides	Hairlike pondweed
Veronica catenata	Pink water speedwell
Wolffia arrhiza	Rootless duckweed
Zannichellia palustris	Horned pondweed

ES Volume 1 Paragraph 10.5.4

2.1.71 Second and third sentence should read: '…would be some 77.6 hectares (ha). A further 8.85 ha would be temporarily affected.'

ES Volume 1 Paragraph 10.5.41

2.1.72 First sentence should read: 'As set out in Appendix 2.2: Drainage Strategy and Appendix S2.2 of this ES Supplement, it is proposed to provide means of regulating flows at the head and outflow of the cross flow culverts.'

ES Volume 1 Paragraph 10.5.44

2.1.73 Should read:

2.1.74 'As explained in the Reen Mitigation Strategy (Appendix 2.3 of the March 2016 ES and Appendix S2.1 of this ES Supplement), 2,755 m of reen and 9,373 m of field ditches would be infilled or culverted during the construction of the new section of motorway. These would be replaced by a total of 2,826 m of new main reen and 10,594 m of new field ditch.'

ES Volume 1 Paragraph 10.5.48

2.1.75 Fourth bullet should read: '8.06 ha of reedbeds'.

ES Volume 1 Paragraph 10.5.117

2.1.76 First sentence should read: 'As explained in Appendix 3.2: The Pre-Construction Environmental Management Plan…'

ES Volume 1 Paragraph 10.5.118

2.1.77 This paragraph refers to provision of means of escape for wildlife from excavations. This should refer to Appendix 3.2 (para 6.5.73) of the March 2016 ES.

ES Volume 1 Paragraph 10.5.119

2.1.78 This paragraph refers to provision of barn owl nest boxes. This should refer to Appendix 3.2 (para 6.5.57) of the March 2016 ES.

ES Volume 1 Paragraph 10.5.120

2.1.79 First sentence should read: 'As explained in Appendix 3.1: The Pre-Construction Environmental Management Plan…'

ES Volume 1 Paragraphs 10.5.121-10.5.124

2.1.80 These paragraphs refer to monitoring during construction and operation of the proposed new section of motorway. Reference should have been made to Appendix 3.2 (Pre-CEMP) of the March 2016 ES which refers to these matters at paras 6.5.75-6.5.78.

ES Volume 1 Paragraph 10.7.55

2.1.81 Should read:

2.1.82 'A total of 2755 m of reens and 9373 m of field ditches would be infilled or culverted during the construction of the new section of motorway. This is described in the Reen Mitigation Strategy (Appendix 2.3 of the March 2016 ES and Appendix S2.1 of this ES Supplement). Of these, 2,702 m of reens within the Gwent Levels SSSIs would be affected, together with 7,676 m of ditches. The Gwent Levels as a whole contain a total of 130 km of reen and 399 km of field ditches. The extent of loss thus amounts to some 2.1% of reens and 1.9% of field ditches.'

ES Volume 1 Paragraphs 10.7.64, 10.9.108, 10.12.42

2.1.83 Area of ponds should read 10.06 ha.

ES Volume 1 Paragraph 10.7.88

2.1.84 Reference to EMP (Figure 2.6 of the March 2016 ES) should be deleted.

ES Volume 1 Paragraph 10.7.102

2.1.85 Last sentence should read '8.06 ha of new reedbeds'.

ES Volume 1 Paragraph 10.7.135

2.1.86 This paragraph should read: '…Great Pencarn, Newport Docks and Tata Steel would be Moderate Adverse and the significance of effects would be Moderate or Large in the short and medium term. In the long term, as the new and replacement habitats develop, the magnitude of impacts would be Minor Adverse and the significance of effects would be Slight or Moderate.'

ES Volume 1 Paragraphs 10.7.176, 10.7.195

2.1.87 These paragraphs refer to an area of woodland loss of 49.7 ha. The correct figure is 49.8 ha.

ES Volume 1 Paragraph 10.8.183

2.1.88 'Ecological Clerk of Works' should read 'Environmental Clerk of Works'.

ES Volume 1 Paragraph 10.9.39

2.1.89 This paragraph refers to Chapter 16: Road Drainage and the Water Environment as explaining that the Drainage Strategy Report (Appendix 2.2 of the March 2016 ES) (that would be implemented as part of the Scheme) has been designed to ensure the capture of any fuel or other spillages that may occur during the operation of the road (e.g. through a vehicle collision or other incident).

2.1.90 The measures to protect the Gwent Levels Sites of Special Scientific Interest (SSSIs) are set out at paragraphs 16.5.1 to 16.5.15 of Chapter 16.

ES Volume 1 Paragraph 10.9.96

2.1.91 First sentence should read: '…short term episodic breaches of ambient chloride concentrations may occur…'.

ES Volume 1 Paragraph 10.9.156

2.1.92 Final sentence of the paragraph should read: 'Aquatic invertebrates with terrestrial or airborne adults may however be able to traverse the mammal crossings and the motorway to colonise new watercourses.'

ES Volume 1 Paragraph 10.12.53

2.1.93 This should read: '…the residual effects of the operation of the proposed new section of motorway would not be significant on any habitats and species included in the Reens, Ditches, Reedbeds and Ponds Ecological Unit, other than for otter.'

ES Volume 1 Table 10.19

2.1.94 An updated Table 10.19 is included in this ES Supplement (Part C).

ES Volume 3 Appendix 10.20

2.1.95 Plans missing from appendix. Provided within Appendix S10.1 of this ES Supplement.

ES Volume 3 Appendix 10.24, Annex C

2.1.96 It should be noted that the lime kiln is incorrectly referred to within Annex C as 'Tree 335' within this report.

ES Volume 3 Appendix 10.30, Paragraph 3.3.5

2.1.97 Reference to NRA should be to NRW.

Chapter 11: Geology and Soils

ES Volume 1 Table 11.1

2.1.98 Line 5, 3rd column. Should be replaced with: 'Confirmed no geological SSSIs, proposed geological SSSIs (GCR sites) or RIGS in the study area.'

ES Volume 1 Paragraph 11.2.5

2.1.99 First sentence should read: 'In Wales, Part IIA of the Environmental Protection Act (EPA) 1990, as introduced by Section 57 of the Environment Act 1995, came into effect in September 2001 with the implementation of the Contaminated Land (Wales) Regulations 2001 (now superseded by the Contaminated Land (Wales) Regulations 2006 and 2012 amendment).'

ES Volume 1 Table 11.2

2.1.100 Non-designated GCRs should fall within the 'very high' sensitivity category.

ES Volume 1 Paragraph 11.4.28

2.1.101 First bullet point to include non-designated GCR sites. Second bullet point to be deleted.

ES Volume 3 Appendix 11.1, Para 1.2.2

2.1.102 First sentence should read: 'In Wales, Part IIA of the Environmental Protection Act (EPA) 1990, as introduced by Section 57 of the Environment Act 1995, came into effect in September 2001 with the implementation of the Contaminated Land (Wales) Regulations 2001 (now superseded by the Contaminated Land (Wales) Regulations 2006 and 2012 amendment).'

ES Volume 3 Appendix 11.1, Para 4.4.9

2.1.103 Last sentence should read: 'However it is notable that the groundwater beneath the proposed new section of motorway is naturally saline in places and thus can be unsuitable as a potable water supply.'

ES Volume 3 Appendix 11.2, Para 1.3.2

2.1.104 First sentence should read: 'The 'Guiding Principles' use the same terms and structure as the 'Model Procedures' of CLR11 which forms a detailed basis for further guidance published by the Welsh Local Government Agency (WLGA) 'Development of Land Affected by Contamination: A Guide for Developers' (WLGA and Environment Agency Wales, 2012).'

ES Volume 3 Appendix 11.2, Para 7.2.6

2.1.105 Second bullet point should read: 'The Contractor shall obtain hazardous waste consignment numbers from Natural Resources Wales for each and every consignment of hazardous waste removed from site.'

2.1.106 Third bullet should read: 'The Contractor shall provide returns from consignees of hazardous waste and provide completed consignment returns back to Natural Resources Wales for each consignment number given to the Contractor.'

ES Volume 3 Appendix 11.5, Table 2

2.1.107 Footnote to be added below the table: 'In the absence of a fixed application charge an OPRA profile will be used to calculate the cost'.

ES Volume 3 Appendix 11.5, Para 3.1.25

2.1.108 Heading above para should read: Protected Species Licences.

Chapter 12: Materials

ES Volume 1 Paragraph 12.2.10

2.1.109 Should be replaced with: 'Land use planning policies for minerals development are set out in Chapter 14 of PPW. These policies set out short and long term

future use and the safeguarding of mineral deposits. The overriding objective is to provide a sustainable pattern of mineral extraction by adhering to the following five key principles.

- Providing positivity for the safeguarding and working of mineral resources to meet society's needs.
- Protecting areas of importance to the natural and built heritage from inappropriate mineral development.
- Reducing the impact of mineral extraction and related operations during the period of working.
- Achieving a high standard of restoration and aftercare and providing for beneficial after-uses when mineral working has ceased.
- Encouraging the efficient and appropriate use of high quality materials and maximising the potential for re-use and recycling.'

ES Volume 1 Paragraph 12.2.11

2.1.110 First sentence should be replaced with: 'Chapter 14 of PPW is supported by the Minerals Technical Advice Note (Wales 1: Aggregates (MTAN 1) (Welsh Assembly Government, 2004).'

Chapter 13: Noise and Vibration

2.1.111 Within the noise model, subsequent to the publication of the March 2016 ES, an error was identified in the 'with-scheme' scenarios. This error is considered to be minor and without significant consequence.

2.1.112 The error, in summary, was that three road links in the model were not assigned the correct traffic flow in the 'with-scheme' scenarios. Two of these links are part of the new roundabouts at the Docks Way and Glan Llyn junctions, and are not significant, given the other roundabout links modelled. The third road link omitted is a 170 metre section of the existing B4245 Newport Road, as it enters Magor.

2.1.113 Also within the model, a number of the receptor prediction locations have been slightly moved, where they fell within a building. This change results in a slight increase in the overall number of receptors reported within the ES.

2.1.114 This has been addressed in the updated modelling provided, which also considers the modifications to the Scheme design (see Part D of this ES Supplement). The findings of the updated modelling are provided in Appendix R13.4, which also addresses the design modifications to the Scheme.

Chapter 14: All Travellers

ES Volume 1 Paragraph 14.4.43

2.1.115 This should read: 'The baseline surveyed 24 hour weekday two-way traffic flows on roads…'

2.1.116 In addition, the traffic flow figures in the bullets below paragraph 14.4.43 included some minor errors. The traffic flows have been updated to reflect the

modifications to the design. Updated traffic information is provided in Appendix R2.1.

ES Volume 1 Paragraph 14.5.1

2.1.117 Second sentence should read: 'In addition, four new public bridleways and two new public footpaths would be created as part of the Scheme'.

ES Volume 1 Paragraph 14.6.3

2.1.118 Third bullet point should read:

- A new public footpath would be created along the fence line of the proposed new section of motorway from public footpath 372/86/1 to the north of the existing M4 to meet St Bride's Road to the west.

2.1.119 An additional bullet point should be added to read:

- A new public bridleway would be created running eastwards along Rush Wall from North Row to the south of the new carriageway, linking to Barecroft Common.

ES Volume 1 Paragraph 14.6.8

2.1.120 Third paragraph should read: 'During construction, NMUs would continue to use the existing alignment of NR88 until the new bridge is operational'.

ES Volume 1 Paragraph 14.6.9

2.1.121 The first sentence should read: 'In addition to these existing resources, four new public bridleways would be created …'.

ES Volume 1 Paragraph 14.6.9

2.1.122 The first sentence should read: 'In addition to these existing resources, four new public bridleways would be created …'.

ES Volume 1 Paragraph 14.8.6

2.1.123 The first sentence should read: 'In addition to these existing resources, four new public bridleways would be created …'.

ES Volume 1 Paragraph 14.9.3

2.1.124 First sentence should read: 'In addition, the following temporary diversions …'

ES Volume 1 Paragraph 14.14.7

2.1.125 The fourth sentence should read: 'In addition, four new public bridleways and two new public footpaths created as part of the Scheme would be operational'.

Chapter 15: Community and Private Assets

ES Volume 1 Paragraph 15.4.171

2.1.126 This should read: 'This plot of approximately 3.38 ha of land is owned by an individual who does not farm the land in hand but lets it out to local farmers.'

ES Volume 1 Paragraph 15.4.200

2.1.127 First sentence should read: 'This holding comprises approximately 100 ha of owner occupied land together with 2-3 ha of land held on short term agreements.'

ES Volume 1 Paragraph 15.6.73

2.1.128 Last sentence should read: 'This loss of a part of the limited ownership of the holding would affect the day to day management of the holding and the capacity to sustain the current livestock numbers on the holding, as this enterprise would be more reliant on finding alternative short term tenancies and other short term arrangements.'

ES Volume 1 Paragraph 15.6.106

2.1.129 First sentence should read: 'A total of approximately 0.69 ha of land …'.

ES Volume 1 Paragraph 15.6.125

2.1.130 Bullet points – delete second reference to Berryhill Farm.

ES Volume 1 Table 15.27

2.1.131 The line for 3e,f under the column entitled Land Take Highway Boundary and other permanent land (ha) should read: '2.72'.

ES Volume 1 Table 15.30

2.1.132 The line for 1cb, Rosedew Farm '17.5' should be deleted from the column entitled 'Ecological Mitigation Areas (ha).

ES Volume 1 Table 15.30

2.1.133 The line for 1cd,ce, Ffynon Rhiwfyltt Farm, '17.5' should be inserted into the column entitled 'Ecological Mitigation Areas (ha).

Chapter 16: Road Drainage and the Water Environment

ES Volume 1 Paragraph 16.3.12

2.1.134 Third bullet should read: 'RPS Surface Water Monitoring 2015/2016 – Four Quarterly Rounds'.

ES Volume 1 Table 16.6

2.1.135 Column 4, row 10 should read: 'Black Rock Limestone subgroup (BRL)'

ES Volume 1 Paragraph 16.4.11

2.1.136 First sentence should read: '…principally through the complex network of tide locked freshwater surface watercourses.' The following should be added after the first sentence: 'These comprise main River reens, former Internal Drainage Board (IDB) maintained reens and field ditches, much of which forms part of the Gwent Levels suite of SSSIs.'

ES Volume 1 Paragraph 16.5.10

2.1.137 First sentence should read: '…most notably with the respect to heavy metals, organic contaminants associated with fuels, oils and hydrocarbon combustion and major ions principally associated with de-icing'.

ES Volume 1 Paragraph 16.5.17

2.1.138 Second sentence should read: 'The estimated length of reens that would be infilled and culverted is approximately 2,755 metres'.

2.1.139 Third sentence should read: 'The estimated length of field ditch crossings that would be infilled as part of the Scheme is approximately 9,373 metres.'

ES Volume 1 Table 16.18 and 16.20, Final column

2.1.140 Final column (several locations) should read: 'RTCs will be developed that are protective of groundwater quality'.

ES Volume 1 Paragraph 16.15.5

2.1.141 Third sentence should read: 'Re-use Target Concentrations will be developed that ensure no unacceptable impact to surface water quality would occur.'

ES Volume 3 Appendix 16.3, Table 3.3

2.1.142 Heading should read: Table 3.3 Principal Pollutant Removal Processes in Vegetated Systems (HA 103/06)

ES Volume 3 Appendix 16.3, Table 4.3

2.1.143 Footer should read: '**Lowest AF value taken from Table 3.1'.

3 Part B: Clarifications

3.1 Cultural Heritage

3.1.1 Following consultation with Cadw, it was agreed that additional clarifications would be placed in the ES Supplement.

Survey Work

3.1.2 One issue on which clarification was requested relates to the need for further explanation regarding the limitations of the remote sensing approaches and the rationale behind the limited amount of intrusive archaeological evaluation undertaken ahead of the publication of draft Orders.

3.1.3 Chapter 8 of the March 2016 ES included a section entitled Limitations of the Assessment (paragraphs 8.3.65 – 8.3.68). This explained that '*A key limitation is with regard to the presence/absence of buried archaeological remains within the Scheme boundary. A number of remote sensing methodologies have been utilised in order to gain as much information as possible at this stage regarding such remains, and some intrusive investigation has been undertaken previously in association with earlier iterations of the Scheme. However, there are some areas of land where ground-based remote sensing was proposed but not undertaken due to issues such as land use, topography or failure to agree access. There are also some areas of land which were brought into the Scheme at a stage when it was not possible to carry out ground-based remote sensing. In addition, there has not been any purposive intrusive archaeological investigation of any location within the Scheme boundary specific to the scheme itself. Consequently, the knowledge of buried archaeological remains, along with those areas considered to be of higher archaeological potential for the presence of archaeological remains, is based on the output from the remote sensing (ground and aerial based) along with the results of previous archaeological investigations and geotechnical surveys*.'

3.1.4 As described in the March 2016 ES, evaluation of the potential buried archaeological resource within the boundary for the proposed new section of motorway has been in the form of desk-based assessment supported by remote sensing allied with the results of previous archaeological fieldwork undertaken with regard to earlier proposed iterations of a new road in the general location of the proposed new section of motorway.

3.1.5 The remote sensing has included ground-based geophysical surveys and also airborne surveys. Two separate types of geophysical surveys were undertaken.

- Gradiometer (fluxgate magnetometer) survey of land on the higher ground at each end of the proposed new section of motorway.
- Electrical Resistance Tomography and Electro-Magnetic surveys within the Gwent Levels part of the proposed new section of motorway.

3.1.6 The results of the gradiometer surveys were reported in detail in Appendix 8.4 of the March 2016 ES and also summarised in Appendix 8.2 of the March 2016 ES. These surveys were aimed at identifying features or sites of archaeological interest within Scheme land take at each end of the proposed new section of motorway. The methodology employed (gradiometry) was considered to be an

appropriate technique for use on the subsoils in these areas. However, this methodology would not be appropriate for use for the Gwent Levels part of the proposed new section of motorway as the waterlogged subsoils here do not respond to magnetic surveys and gradiometer survey was not proposed for these areas.

3.1.7 As identified in paragraph 8.3.66 of the March 2016 ES, there are some areas of land where gradiometer survey was proposed but where it was not possible for this work to be undertaken. In some cases, this was due to the land use not being conducive for this type of survey (such as areas of scrub, or plant nurseries), or as a result of the land being too steep for the survey to be carried out.

3.1.8 There are some areas of land where gradiometer survey was proposed but where it was not possible to agree access for the work; mostly because of the presence of livestock that the owner/tenant was not willing to move for the duration of the survey.

3.1.9 There are also some areas of land at each end of the proposed new section of motorway which were brought into the Scheme at a stage when it was not possible to carry out ground-based remote sensing. This includes some areas of temporary land take required for storage of materials.

3.1.10 Initial proposals were for 60 hectares of land to be surveyed using gradiometer techniques. However, the total area of land that was actually surveyed was 52.4 hectares, for the reasons set out above. For the remainder of the land and for the land where gradiometer techniques were not proposed, desk based methodologies were employed as set out in the March 2016 ES.

3.1.11 Appendix 8.10 of the March 2016 ES comprises the Cultural Heritage Mitigation Plan (CHMP). This document describes the further archaeological work that is proposed ahead of and during construction, should the Scheme proceed. A total of 45 areas have been identified where future archaeological evaluation is proposed – these include land where gradiometer survey has been previously proposed but not undertaken, along with those areas of land that were brought into the Scheme at a late stage and/or where no archaeological evaluation has been undertaken other than desk-based assessment. The appropriate methodologies and extent of the archaeological evaluations to be undertaken in these areas would be determined following review of the likely impacts resulting from Scheme construction. Such methodologies would be agreed with the independent archaeological curator appointed by Welsh Government. As set out in the DMRB HA 75/01 (Highways Agency *et al*., 2001) the role of Curator is defined as '*the archaeologists charged with protecting and monitoring the archaeological resource……Curators would normally advise on the significance of the archaeological resources, may prepare or advise on the contents of Project Briefs and Project Designs and may monitor the performance of Archaeological Contractors*'.

3.1.12 As described above, a programme of Electrical Resistance Tomography (ERT) and Electro-Magnetic (EM) surveys was undertaken within the Gwent Levels part of the proposed new section of motorway. The detailed results of these complementary surveys are described in Appendix 8.4 of the March 2016 ES.

3.1.13 The purpose of the ERT and EM surveys was not to identify features or sites of archaeological interest. These surveys provided data which were used in determining the character and distribution of the main lithological units within that part of the Gwent Levels traversed by the proposed new section of motorway. As with the gradiometer survey, there were some areas of land where ERT and EM survey was proposed but where it was not possible for this work to be undertaken or not possible to agree access for the work.

3.1.14 The data obtained through the ERT and EM surveys were combined with further information taken from the geotechnical surveys and used to construct a detailed Archaeological Deposit Model for that part of the Gwent Levels traversed by the proposed new section of motorway (Appendix 8.8 of the March 2016 ES). The deposit model shows the depth and nature of the Holocene deposits within the Gwent Levels at this location. This information would be used in formulating the detailed methodologies and extents of the further archaeological works to be undertaken in these areas, following review of the likely impacts resulting from Scheme construction. Such methodologies would be agreed with the independent archaeological curator appointed by Welsh Government.

3.1.15 As mentioned above, additional remote sensing was undertaken in the form of airborne surveys and appraisal of other acquired datasets. This work applied to the whole of the route of the proposed new section of motorway and was aimed at the identification of features or sites of archaeological interest at surface or immediate subsurface level.

3.1.16 This additional remote sensing comprised three principal elements.

- An archaeological review of LiDAR (Light Detection and Ranging) data provided specifically for the Scheme.
- An archaeological review of commercially available orthorectified satellite data.
- An archaeological review of aerial photogrammetric data obtained through purposive flights using a light aircraft.

3.1.17 The results of the additional remote sensing are reported in Appendix 8.7 of the March 2016 ES and assimilated into the desk-based assessment presented as Appendix 8.2 of the March 2016 ES. There were no areas where this additional remote sensing had been proposed but not carried out.

3.1.18 A considerable number of features or sites of archaeological interest were identified, mostly in the form of earthworks representing agricultural activity. This information would be used in formulating the detailed methodologies and extents of the further archaeological works to be undertaken in these areas, following review of the likely impacts resulting from Scheme construction. Such methodologies would be agreed with the independent archaeological curator appointed by Welsh Government.

3.1.19 No purposive intrusive archaeological evaluation in the form of trial trenches and/or test pits specific to the Scheme was undertaken ahead of the publication of draft Orders. Some work of this type has been previously undertaken with regard to previous iterations of the proposed new section of motorway and the results of such work have been examined and described within the desk-based assessment presented as Appendix 8.2 of the March 2016 ES.

3.1.20 The methodology utilised for intrusive evaluation needs to be closely aligned with the nature and extent of any impact resulting from the Scheme. The Gwent Levels Archaeological Deposit Model (Appendix 8.8. of the March 2016 ES) has established the location and extent of areas of higher archaeological potential in this part of the Scheme. The impacts of the Scheme in this area are described in paragraphs 5.3.13 – 5.3.17 of the CHMP (Appendix 8.10 of the March 2016 ES) and in further detail in the Buildability Report (Appendix 3.1 of the March 2016 ES).

3.1.21 Impacts in areas of higher archaeological potential within the Gwent Levels could occur to depths of 7 metres or more below current ground level. Examination of this archaeological potential through the use of trial trenches would therefore require substantial excavations – exposure of just a 2 x 2 metre area at a depth of 7 metres would require an excavation measuring at least 16 by 16 metres at surface level.

3.1.22 Geotechnical work in this part of the Levels undertaken in connection with the Scheme has confirmed that each area of investigation would need to be pumped on a 24 hour basis, with discharge either to ground or to a reen (with the consent of Natural Resources Wales), and the excavation area and spoil heaps would need to be fully fenced. There would need to be night-time security for health and safety purposes. It may be that a temporary access road would need to be constructed in order to reach each location where excavation is required.

3.1.23 On completion of the excavation at each location, the trench would have to be backfilled with the arisings. Given the nature of the ground this would result in an area of very wet, soft ground that would be unsuitable for grazing or cultivation. If there are livestock in the vicinity then the backfilled excavation area would need to remain fenced.

3.1.24 Thus it is clear that the excavation of trial trenches in the Gwent Levels prior to the confirmation of the Orders could result in a considerable amount of visible and physical impact within the registered historic landscape and Sites of Special Scientific Interest but without the surety that the Scheme would actually proceed. If the Scheme does not progress through to construction then this work could leave a legacy of visible impact along with short to medium term issues regarding loss of grazing or crop acreage.

3.1.25 In addition, there is a need to align the archaeological investigations with the nature of the Scheme impacts as discussed below. The construction strategy as described in the Buildability Report (Appendix 3.1 of the March 2016 ES) is to keep the surface ‘crust’ intact across the Gwent Levels, with band drains used to reduce surcharge rather than any more intrusive methodology. The opening up of deep areas for archaeological investigations would impact on that strategy and result in areas where the surface ‘crust’ was not present. Therefore, investigations are not proposed in areas where the surface ‘crust’ would otherwise be undisturbed.

3.1.26 Where intrusive archaeological evaluation is undertaken within that part of the Gwent Levels traversed by the proposed new section of motorway, this would be done once the Orders for the Scheme have been confirmed. This would allow the Contractor much greater control with regard to access, security and reinstatement. The appropriate methodologies and extent of the archaeological evaluations to be undertaken in these areas would be determined following

review of the likely impacts resulting from Scheme construction. Such methodologies would be agreed with the independent archaeological curator appointed by Welsh Government.

3.1.27 Outside of the Gwent Levels, there are some areas where trial trenches may provide further details in relation to buried archaeology. These are largely areas that were brought into the Scheme at a fairly late stage. These areas are identified within the CHMP (Appendix 8.10 of the March 2016 ES) and will be evaluated at the earliest possible time within the construction programme or possibly in advance of this programme. The appropriate methodologies and extent of the archaeological evaluations to be undertaken in these areas would be determined following review of the likely impacts resulting from Scheme construction. Such methodologies would be agreed with the independent archaeological curator appointed by Welsh Government.

Mitigation

3.1.28 A second issue on which clarification is provided relates to the overall strategy for 'mitigation' when dealing with effects on buried archaeological remains in connection with the construction and operation of the Scheme.

3.1.29 National policy on planning and the historic environment, including Planning Policy Wales (Welsh Government, 2016a) and Welsh Office Circular 60/96 (Welsh Office, 1996), places an emphasis on the need to preserve archaeological remains wherever possible through avoidance or reduction of impacts.

3.1.30 However, paragraph 8.6.30 of the March 2016 ES identifies that a programme of further archaeological investigation is described in the CHMP (Appendix 8.10 of the March 2016 ES), and then goes on to state that 'the implementation of the programme of further archaeological work would not result in the avoidance or reduction of the potential impacts and effects on these buried archaeological remains but rather should be seen as a 'remedy'.'

3.1.31 Section 1 of the CHMP (Appendix 8.10 of the March 2016 ES) describes the inherent complexities present within the Design Manual for Roads and Bridges (DMRB - Highways Agency *et al.,* 2008) when it comes to dealing with what is 'mitigation' and what should more accurately be described as 'off-setting' or 'remediating' impacts on buried archaeological remains.

3.1.32 Section 8.5 of the March 2016 ES describes mitigation measures that have been incorporated into the Scheme design. Although not explicitly stated as such, this includes examples where cultural heritage remains would be preserved *in situ*. One example is the Scheduled standing stone at Undy (MM068), which would be retained in its current location with improved public access and information. Another example is at Llandevenny where a proposed Water Treatment Area has been relocated to the south side of the proposed new section of motorway in order to avoid a direct and considerable impact on a site where a quantity of Mesolithic and early Neolithic flints has previously been identified.

3.1.33 Other elements of the proposed new section of motorway have also been designed with the aim of preserving archaeological remains *in situ*. Areas identified for the storage of materials (including soils and unsuitable materials) would not be stripped of topsoil as part of process of preparation. Instead a layer of geotextile matting would be placed over the current surface. This would

enable preservation of buried archaeological remains *in situ* if any such are present within these areas.

3.1.34 Similarly, within the Gwent Levels part of the proposed new section of motorway, topsoil would generally be retained as part of the strategy of keeping the 'crust' intact. This is described in paragraphs 7.3.36-7.3.38 of the Buildability Report (Appendix 3.1 of the March 2016 ES). A geotextile or geogrid would be placed directly over the present ground surface and then stone would be placed on top of the geotextile/geogrid. Impacts on archaeological remains within and beneath the topsoil would therefore be limited to interventions through this protective layer (such as band drains and pre-cast piles), in the transition zones between the piled embankments and the surcharged areas where soil mixing may be required, and for areas of cut outside of the highway footprint such as water treatment areas, replacement reens, etc.

3.1.35 As discussed above, where impacts resulting from construction of the proposed new section of motorway are limited to band drains and/or pre-cast piles, archaeological evaluation in the form of trial trenches could be more damaging to buried archaeological remains than the motorway itself. This is because the area of excavation required for the archaeological investigation would be larger than the area of impact resulting from construction of the proposed new section of motorway. Preservation *in situ* in this situation would therefore be a matter of controlling impacts through design.

3.1.36 Consequently, any form of archaeological evaluation needs to be carefully aligned with the nature and locations of impacts from the proposed new section of motorway and this is best done in the detailed design stage of work.

3.1.37 Once the proposed new section of motorway has been through the detailed design stage and construction has started, opportunities to achieve preservation *in situ* of archaeological remains would be relatively limited. It may be possible to retain archaeological remains within borrow pits although this would require the winning of replacement stone from another suitable location. It is less likely for archaeological sites within water treatment areas as volumes are very specific and excavating deeper in other parts of the water treatment area would not necessarily provide appropriate replacement volume. For locations where elements of the proposed new section of motorway are located within cuttings it would clearly not be possible to preserve archaeological sites *in situ*.

3.1.38 The discussion presented above demonstrates how the overall strategy for 'mitigation' when dealing with effects on buried archaeological remains is in line with national policy and with DMRB in that opportunities to preserve archaeological remains *in situ* through avoidance or reduction of impacts have been, and will continue to be, sought wherever this is possible.

Marine Historic Environment

3.1.39 Baseline information on cultural heritage was provided in Chapter 8 of the March 2016 ES and in the accompanying appendices, including information relating to those elements of the marine/tidal environment within the study area for the proposed new section of motorway. For clarification, the information relating to those parts of the route between mean high water springs for both the Rivers Usk and Ebbw is set out below.

3.1.40 Figure 2d of Appendix 8.2 of the March 2016 ES (Desk Based Assessment) shows the location of historic environment features identified in the River Usk channel – descriptions are provided in the Gazetteer which forms Annex A of that appendix. Figure 2c of Appendix 8.2 of the March 2016 ES shows the location of a single historic environment feature within the marine historic environment in the River Ebbw channel.

3.1.41 There is the potential for impact on one historic environment feature within the marine historic environment in the east side of the River Usk channel. This is HB080, described in the Gazetteer as a mooring chain. No recovery is proposed for this feature if still present at the time of commencement of construction. Construction works in this area would be covered by an archaeological watching brief (as described in Section 5.4 of the CHMP – Appendix 8.10 of the March 2016 ES), as would all works within the area between the mean high water (springs) level and the mean low water (springs) level at the River Usk and Ebbw Crossings. In the event of the discovery of cultural heritage remains, the procedures described in Section 5.4 of the CHMP (Appendix 8.10 of the March 2016 ES) would be implemented.

3.1.42 No impacts are predicted for any historic environment feature within the marine historic environment in the west side of the River Usk channel (as no works are proposed in this location).

3.1.43 No impacts are predicted for the single historic environment feature within the marine historic environment in the River Ebbw channel, which would be retained *in situ* in accordance with national policy (e.g. Planning Policy Wales).

3.2 Landscape and Visual

Construction

3.2.1 The assessment of construction effects presented in Section 9.7 of the March 2016 ES did not fully consider the following aspects of the construction phase.

- Water Treatment Areas (WTAs) to be constructed in a temporary form at the start of the construction phase.
- Material from Ifton Quarry to be transported via a temporary haul road.

3.2.2 Water Treatment Areas would be constructed in a temporary form at the start of the construction phase as part of the water management system. These temporary lagoons would be formed by approximately 1 metre high perimeter bunds on top of the existing ground surface. These would require ongoing management during the construction phase to remove sediment build up using a small excavator.

3.2.3 Material from the nearby Ifton Quarry would be used to supply the Scheme and a temporary haul road would be constructed as a direct link between the quarry and the construction area to the north of Magor. This haul road is proposed to run from the junction of the existing track to the quarry and westwards across open farmland (along the former alignment of the access route to the quarry) towards Minnetts Lane. The haul route would then run south parallel to Minnetts Lane before turning westwards towards Bencroft Lane and Magor.

3.2.4 The consequences of these construction methodology details set out above are considered below.

3.2.5 The construction, use and maintenance of the temporary Water Treatment Areas during the construction phase would have a noticeable effect on the visual amenity of the following receptor groups due to their proximity (see Figures 9.16, 9.17 and 9.18 of the March 2016 ES and Figures R 9.16, R9.17 and R9.18 of this ES Supplement for locations).

- Residential receptor group 15 (Properties on Walk Farm Drive).
- Non-residential receptor 16 (Coach and Horses pub/restaurant).
- PRoW receptor group 15 (footpath 399/25).

3.2.6 When describing the nature of effect on these receptors the March 2016 ES stated that the construction of the Water Treatment Areas would be a highly noticeable element in the views available (refer to paragraphs 9.7.165, 9.7.211 and 9.7.241). The ES assessed that they would experience either a large or very large temporary adverse significance of effect on their visual amenity during the construction phase. Although the construction, use and ongoing maintenance of the temporary Water Treatment Areas changes the nature of the effect slightly, it is not considered that this would change the significance of effect for these receptors.

3.2.7 The construction and use of the Ifton Quarry haul road would affect an additional residential receptor not originally identified as being subject to any visual effects. An assessment for this receptor is provided in the following table.

3.2.8 The effect of the construction phase on the visual amenity of this receptor would be of slight adverse significance due to the screening effect of existing intervening vegetation. After the construction phase, the haul road would be removed and the land returned to agricultural use. Visual amenity would then return to the baseline situation. There would be no operational phase effects.

ES Supplement Table 3.1: Additional Residential Receptor Assessment

Reference	147b
Type	"Highfields Bungalow". Chalet bungalow, high sensitivity
Distance	Short (< 1 km)
Existing View	Windows on the rear of this property and the rear gardens face directly towards the route of the Ifton Quarry haul road that lies less than 100 metres from the property at its closest point. The property grounds are largely surrounded by mature tree belts and unmanaged hedges that mean that views out across the surrounding agricultural landscape are limited and well filtered.
Construction Effects	**Construction**: Intermittent and well filtered views of construction traffic travelling along the Ifton Quarry haul road would be available from some garden areas and windows on the rear elevation. Views would mainly be available during the winter months as foliage on the trees surrounding the property are likely to create an effective screen during the summer months. During late afternoon working in winter, headlights on construction vehicles using the haul road are likely to be glimpsed through the intervening vegetation. The intermittent and well filtered nature of views to construction elements reduces the magnitude of impact, despite the receptors proximity.
	Magnitude of Impact: Minor adverse **Significance of Effect: Slight adverse**

Year 1 Effects	The haul road would be restored and returned to agricultural use. Visual amenity would return to the baseline situation.
	Magnitude of Impact: No change **Significance of Effect: Neutral**
Year 15 Effects	As for year 1
	Magnitude of Impact: No change **Significance of Effect: Neutral**

Visual Assessment of Roads and Public Transport Routes

3.2.9 Appendix 9.11 of the March 2016 ES presents the visual assessment for roads and public transport routes. Seven of these receptor groups also represent National Cycle Network (NCN) routes. For completeness, a summary of the assessment of the visual effects of construction and operation of the proposed new section of motorway on the users of the NCN routes is provided below and a full assessment is provided in Appendix R9.11 of this ES Supplement.

3.2.10 St. Mellons Road and Wellfield Road (receptor group 154) form part of NCN Route 4. Users of this cycle route in this area would have an intermittent view of the construction area associated with the Castleton Interchange including woodland clearance and earthworks. This would result in slight to moderate adverse significance of effects during construction. During operation, users of this cycle route in this area would experience a slight to moderate adverse significance of effect during year 1, reducing to a neutral effect during year 15 as proposed woodland planting around the Castleton Interchange area would largely return visual amenity to the baseline situation.

3.2.11 Ty Mawr Lane (receptor 157) forms part of NCN Route 88. Users of this cycle route in this area would experience a moderate adverse significance of effect during construction from a proportion of the route due to views of the extensive woodland clearance, earthworks and construction of bridges and flyovers associated with the Castleton Interchange area. During operation, receptors using the cycle route would experience a moderate adverse significance of effect during year 1 due to views of the traffic and infrastructure associated with the Castleton Interchange area, reducing to a slight adverse significance of effect during year 15 as proposed vegetation matures.

3.2.12 The A48 between City Bridge and Alexandra Docks (receptor group 160A) and Corporation Road (receptor group 162) forms part of NCN Route 4 and travels predominantly through an industrial area. However, the route offers frequent long range views near the River Usk. During construction, users of this cycle route in these areas would experience a moderate to large significance of effect due to construction views of the River Usk and Ebbw crossings and of motorway infrastructure. The significance of effect would remain as moderate to large during operation in years 1 and 15 as the River Usk Crossing and its approaches would remain a prominent visual feature. It is considered that this element would make a positive contribution to visual amenity, being a higher quality and more aesthetically pleasing feature than the surrounding industrial buildings and chimneys. Therefore, effects are considered to be beneficial in some cases.

3.2.13 Broadstreet Common (receptor 168) forms part NCN Route 4. Users of the cycle route in this area would experience a temporary moderate to large adverse significance of effect during construction from a proportion of the route due to glimpsed and filtered views of the construction area of the proposed new section

of motorway in the vicinity of Pye Corner. During operation users of the cycle route would experience a moderate to large adverse significance of effect in year 1 as a result of filtered views of infrastructure and traffic associated with the proposed new section of motorway. This would reduce to a slight to moderate adverse significance of effect in year 15 as proposed vegetation matures.

3.2.14 Receptor group 170 (Broadstreet Common) forms part of NCN Route 4. Users of this cycle route in this area would experience a temporary moderate adverse significance of effect from a proportion of the route due to views of construction activities. During operation users of this cycle route in this area would experience a slight to moderate adverse significance of effect in both year 1 and year 15.

3.2.15 North Row, South Row, Pill Street and The Causeway (receptor group 174) form part of NCN Route 4. The roads are frequently lined with hedgerows, meaning views out are intermittent. Where views are available they encompass the surrounding agricultural area, most frequently pasture fields bounded by a mix of hedgerows and reens. During construction, users of the cycle route in this area would have intermittent but frequent views of the taller items of plant resulting in a slight to moderate adverse significance of effect. During operation, views would remain as slight to moderate adverse (year 1 and year 15) as taller vehicles using the new section of motorway would be clearly visible above and between the intervening hedgerows.

3.3 Ecology and Nature Conservation

3.3.1 Following publication of the March 2016 ES, Gwent Wildlife Trust have advised that part of an area of land at Barecroft Fields which is mapped as a Site of Interest for Nature Conservation (SINC) mapped on the plan at Figure 10.3d of the March 2016 ES, and which is owned by the Trust is part of their Magor Marsh Nature Reserve. The information on the extent of Magor Marsh Nature Reserve which formed the basis for the boundary of the reserve shown on the March 2016 ES Figure 10.3d was obtained from the South East Wales Biological Records Centre (SEWBRC). Plans of the Magor Marsh Nature Reserve are available on the board at the nature reserve and on the Trust's website. Neither the SEWBRC nor the Trust's plan indicated that any land at Barecroft was part of the Magor Marsh Nature Reserve.

3.3.2 Regardless of ownership, the effects of the Scheme on Barecroft Fields SINC were assessed as part of the assessment of the effects on non-statutory designated sites and this identifies that there would be a loss of a small area of land at the north west corner of the SINC (paragraph 10.7.33). There would also be some disturbance during construction and operation of the new section of motorway as this would be adjacent to the site. The Barecroft Fields SINC is also part of the Redwick and Llandevenny SSSI and the effects are included in the assessment of effects on SSSIs.

3.3.3 Accepting that Barecroft Fields is also part of Magor Marsh Nature Reserve, a receptor of Regional/County (Medium) value, then the assessment of effects on the site may be summarised as follows.

ES Supplement Table 3.2: Summary of Effects on Magor Marsh Nature Reserve

Activity/ Receptor	Value of receptor	Description of impact	Short / medium / long term	Magnitude of impact (without mitigation)	Significance of effect (without mitigation)	Magnitude of impact (with mitigation)	Significance of effect (with mitigation)	Significant / Not significant In EIA terms
Land take								
Magor Marsh Nature Reserve	Medium	Habitat loss	Short/ Medium/ Long term	Minor Adverse	Slight	Minor Adverse	Slight	Not significant
Construction phase								
Magor Marsh Nature Reserve	Medium	Disturbance	Short/ Medium term	Minor Adverse	Slight	Minor Adverse	Slight	Not significant
			Long term	No change	Neutral	No change	Neutral	Not significant
Operational Phase								
Magor Marsh Nature Reserve	Medium	Disturbance	Long term	Minor Adverse	Slight	Minor Adverse	Slight	Not significant

3.3.4 In addition, Gwent Wildlife Trust requested a breakdown of effects in terms of land take within Sites of Importance for Nature Conservation (SINCs). As explained in the March 2016 ES Chapter 10, a total of nine SINCs would be directly affected by the proposed new section of motorway. The area affected was not quantified within the ES apart from at Solutia. The area of the Solutia SINC was quantified within Chapter 10 as this would be the SINC where the greatest total area of land would be affected. The relevant areas of the other SINCs which would be directly affected is as follows.

ES Supplement Table 3.3: Effects on SINCs

SINC	Area outside land take for Scheme (hectares)	Area within land take for Scheme (hectares)	Total Area (hectares)	% Affected
Afon Ebbw River	16.66	0.60	17.26	0.03
Marshall's	7.90	2.40	10.30	23.3
Solutia Site	51.7	12.7	64.40	19.7
Spencer Works 3	1.14	1.71	2.86	59.8
Barecroft Fields	4.64	0.10	4.74	2.11
Bowkett Field, Barecroft	1.61	0.53	2.13	24.9
Land at Barecroft Common	6.32	0.01	6.34	0.16
Grange Road	1.53	0.82	2.36	34.8
Upper Grange Farm Field	0	0.45	0.45	100.0

3.3.5 The March 2016 ES stated that the Upper Grange Farm Field SINC would be subject to some loss as a result of the construction of the new section of motorway and works to the St Bride's Underbridge. It is noted that the new section of motorway and associated construction works would remove all of this SINC.

3.4 All Travellers

3.4.1 As stated in paragraph 14.6.8 of Chapter 14 of the March 2016 ES, a section of the Cardiff to Newport Cycleway (NR88) would be permanently stopped up where it is crossed by the proposed new section of motorway and diverted across the Percoed NMU Bridge (SBR 0580) for all Non-Motorised Users NMUs) and that during construction, NMUs would continue to use the existing alignment of NR88 until the new bridge is operational. Following further work on the detailed phasing of the construction activities in this location, the potential need for a temporary diversion of NR88, within the permanent and temporary land take areas for the proposed new section of motorway has been identified. This may be required during some phases of the construction programme e.g. during the construction of the NMU bridge sub-structure and placement of the steel structure, to ensure the safety of all NMUs. An indicative alignment for such a temporary diversion is illustrated on Figure S14.1 between Point A and Point B. The route would be a minimum of 3 metres in width with a suitable hardened surface. These temporary arrangements have been discussed with Sustrans and would not affect the conclusions of the assessment.

3.4.2 A new shared-use path is to be provided on the B4245 between Undy and Rogiet in the vicinity of the proposed new motorway junction as part of the Scheme. The extent of this facility is shown on Figure R14.3i.

3.5 Community and Private Assets

3.5.1 As set out in the Ecology and Nature Conservation section above, Gwent Wildlife Trust, in their response to the draft Orders, state that part of an area of land at Barecroft Fields is considered by the Trust to be part of their Magor Marsh Nature Reserve.

3.5.2 Therefore, paragraph 15.4.12 (5th bullet point) of the March 2016 ES should be replaced with the following paragraph.

3.5.3 Gwent Wildlife Trust, in their response to the draft Orders, state that part of an area of land at Barecroft Fields which is owned by the Trust and which would be within the land take for the new section of motorway, is considered by the Trust to be part of their Magor Marsh Nature Reserve. In relation to this topic, the public are guided by information on the website and at the location towards the 'Dragonfly Trail' and the 'Butterfly Trail' which are located to the west of the car park, between Whitewall Reen and Blackwall Reen. The land taken at Barecroft Fields is over 840 metres to the west of the nearest point of these trails.

4 Part C: Additional Information

4.1 Legislative and Policy Context

4.1.1 The following legislation and guidance has been updated or amended since the publication of the March 2016 ES.

Environment (Wales) Act 2016

4.1.2 The Environment (Wales) Act became law in Wales on 21 March 2016. The March 2016 ES took into account the provisions of the Environment Bill (Wales) 2015. The enactment does not change the key provisions set out in the Environment Bill (Wales) 2015.

Historic Environment (Wales) Act 2016

4.1.3 The Historic Environment (Wales) Act 2016 became law in Wales on 21 March 2016. The March 2016 ES took into account the provisions of the Historic Environment (Wales) Bill 2015. The enactment does not change the key provisions set out in the Historic Environment (Wales) Bill 2015.

4.1.4 New draft policy, advice and guidance documents are being prepared by Cadw, the first group of which are undergoing public consultation until October 2016. These include a draft Technical Advice Note 24: The Historic Environment (Welsh Government, 2016b), along with guidance on Heritage Impact Assessment (Welsh Government, 2016c), and on the Setting of Heritage Assets (Welsh Government, 2016d). A separate consultation has been undertaken with regard to the revision of Chapter 6: The Historic Environment of Planning Policy Wales. This concluded in June 2016 and a final version of the revised chapter will be published before the end of 2016.

4.2 Scheme Description

4.2.1 The Reen Mitigation Strategy provided as Appendix 2.3 of the March 2016 ES has been updated to reflect consultation undertaken with NRW. An update to the strategy is provided at Appendix S2.1 of this Supplement.

4.3 Air Quality

4.3.1 The following information has become available since publication of the March 2016 ES.

- Updated Local Air Quality Management technical and policy guidance published in spring 2016.
- More recent air quality data for 2015 (published in 2016) from Newport City Council.

4.3.2 In addition, the assessment of construction effects presented in Section 7.7 of the March 2016 ES did not consider heavy goods vehicle (HGV) movements along the temporary construction haul road or construction staff traffic movements across the local road network.

4.3.3 The consequences of the additional information set out above have been considered in this section.

Updated Technical and Policy Guidance

4.3.4 Local Air Quality Management technical and policy guidance documents were updated in spring 2016 (Defra *et al.,* 2016 and Welsh Government, 2016). These documents have been reviewed to ensure that the assessment methods applied in the air quality chapter of the March 2016 ES remain applicable. No update to the assessment methodology set out in the March 2016 ES is required as a result of the April 2016 updates of the technical and policy guidance documents. The primary reason for the update to these documents was to account for a change in the Local Air Quality Management regime in England and Scotland. However, the regime in Wales remains as set out in previous versions of the guidance.

Updated Air Quality Data

4.3.5 Newport City Council operates ongoing air quality monitoring in the vicinity of the Scheme and the latest data available for 2015 have been obtained and are presented in Appendix R7.2 of this ES Supplement. The updated monitoring data show that the latest monitored concentrations are similar to the monitored concentrations presented for previous years in Appendix 7.2 of the March 2016 ES. Therefore, the baseline environment as reported is not significantly altered and the new data would not alter the conclusions set out in the March 2016 ES.

Assessment of Construction Effects

4.3.6 The construction traffic assessment has been updated to account for HGV movements along the temporary haul road for the proposed new section of motorway and to include construction staff vehicles movements across the network. As stated in paragraph 7.3.35 of the March 2016 ES, final routing of these vehicles has not been confirmed and therefore these movements have been applied across all routes in the local road network in order to consider a worst case scenario.

4.3.7 It is anticipated that there would be approximately 239 HGV movements along the haul road. In addition there would be approximately 1,049 staff vehicle movements across the local road network (see Appendix 3.3 of the March 2016 ES). It has been assumed that all movements using light goods vehicles would occur for every day of the construction period as a worst case, although it is likely that these would occur in phases throughout the construction period. In addition, as a worst case, it has been assumed that all construction traffic would operate seven days a week throughout the construction period, it is unlikely that this will be the case.

4.3.8 The results of consideration of these traffic movements have been included in an updated assessment provided in Appendix R7.3.

4.3.9 No exceedences of the air quality objectives relevant to human health are predicted in 2018, with or without the construction of the Scheme. At human health receptors assessed, the impact of additional traffic during the construction phase on annual mean NO_2 concentrations would be negligible to minor adverse, based on the criteria outlined in Table 7.12 of the March 2016 ES. The impact on annual mean PM_{10} concentrations would be negligible.

4.3.10 Exceedences of the annual mean NO_x objective for the protection of vegetation are predicted at Langstone – Llanmartin Meadows SSSI in both the 'with' and 'without construction' scenarios in 2018. Exceedences of the annual mean NO_x objective are also predicted at Severn Estuary Special Protection Area (SPA), however this is a marine habitat and therefore the objective for the protection of vegetation does not apply.

4.3.11 At ecological receptors assessed, the impact of additional traffic associated with the construction phase on annual mean NO_x concentrations would be negligible to minor adverse, with the exception of Receptor Eco 75 (Severn Estuary SPA) where a moderate adverse impact is predicted. As discussed above, as the Severn Estuary is designated as a marine habitat, the annual mean NO_x objective does not apply.

4.3.12 At the majority of ecological receptors assessed, additional traffic associated with the construction phase would not result in any change in total nitrogen deposition. The maximum increase in total nitrogen deposition associated with additional traffic movements during construction is 0.1 kgN/ha/yr and is predicted at locations within the River Usk Special Area of Conservation (SAC)/SSSI, Redwick and Llandevenny SSSI, Nedern Brook Wetlands SSSI, Severn Estuary SPA/SAC and River Wye SAC/SSSI up to 20 metres from the nearest road.

4.3.13 The conclusion of the updated assessment of air quality effects associated with construction traffic remains as set out in the March 2016 ES. Effects from construction traffic would be not significant.

4.4 Cultural Heritage

4.4.1 The following information has become available since publication of the March 2016 ES.

- Additional survey information regarding the Pye Corner Barrage Balloon Tethers (HB087).
- The identification of additional non-designated Historic Landscape Character Areas (HLCAs), together with corresponding amendments and additions to the text in Chapter 8.
- Photomontages showing additional views of the Scheme.

Pye Corner Barrage Balloon Tethers (HB087)

4.4.2 Discussion has been undertaken with Cadw regarding the rarity and hence the value of this site and an additional site visit has been undertaken in order to establish more fully the nature of the site and the location of its constituent parts with regard to the Scheme.

4.4.3 The description of this site provided in the March 2016 ES states that '*The field immediately to the north of the former Baptist Chapel contains a number of concrete blocks with iron rings set into the upper surface. These are considered to be tether points for barrage balloons used for the defence of Newport during the Second World War. There are also two potential hut bases at the eastern edge of this field, adjacent to Nash Road, which may be associated with the tether points'* (paragraph 8.6.148).

4.4.4 A site visit undertaken subsequent to the publication of the draft Orders has provided further information. The description of the site provided above is accurate, however the site is better preserved than previously thought and more of the constituent elements have survived. The attribution of function (i.e. a barrage balloon site of Second World War date) is now confirmed.

4.4.5 The assessment of potential land take effects on this site in the March 2016 ES stated that '*This is a low value heritage asset and the magnitude of impact would be moderate – the land is required for landscape planting and this can be carried out in such a way that the historic structures remain intact but their setting would be altered. The consequent significance of effect would be slight*' (paragraph 8.6.149).

4.4.6 Further consideration has been given to the rarity of this site, especially with regard to the extent of preservation revealed by the further site visit. The site is now regarded as a high value heritage asset. The site visit also established that much of the site is located further to the north than was previously recorded. Consequently, that part of the site falls within land required for the proposed new section of motorway, with just a small part at the southern edge being within land required for landscape planting.

4.4.7 The magnitude of impact on this heritage asset is therefore major, as most of the site would be destroyed and the setting of the remaining part would be substantially altered. The consequent significance of effect has been assessed as large. This would be a significant effect. The site would be subject to detailed historic building recording as already proposed in the CHMP (Appendix 8.10 of the March 2016 ES).

Non-designated Historic Landscape Character Areas (HLCAs)

4.4.8 The March 2016 ES included an appendix which described the baseline position with regard to the non-designated historic landscape (Appendix 8.9). A total of 31 Historic Landscape Character Areas (HLCAs) were identified, using appropriate guidance and previous studies. In the March 2016 ES, it was found that 12 of these HLCAs would experience direct physical impacts as a result of the construction of the proposed new section of motorway, whilst the remaining 19 HLCAs would experience indirect (non-physical) impacts (paragraph 8.6.42).

4.4.9 As a result of discussions with the independent archaeological Curator appointed by Welsh Government, a revised appendix has been produced with regard to the baseline position for the non-designated historic landscape (Appendix R8.9). One of the previously identified HLCAs (HLCA 106) has been split into two separate HLCAs (HLCAs 106 and 131) and five additional HLCAs have been established (HLCAs 132-136). Consequently there are now 37 HLCAs, of which 13 would experience direct physical impacts as a result of the construction of the proposed new section of motorway, whilst the remaining 24 would experience indirect (non-physical) impacts.

4.4.10 Paragraph 8.6.50 of the March 2016 ES (M4CaN HLCA106 Croes-Carn-Einion) should be replaced by the following text:

'*This is a large HLCA taking in land to the north of the current M4 motorway, west of junction 28. The land rises up from the motorway to a ridge of higher ground*

and then falls away to the north. There is an earthwork enclosure of probable later prehistoric date (maybe a small hillfort) on the ridge in the western part. Across much of the HLCA the field boundaries are straight, indicating an 18th/19th century reorganisation of an earlier field system from which few sinuous boundaries have survived. There has been a considerable amount of boundary loss in the modern period, particularly in the fields close to the M4 motorway. A low value has been ascribed to this HLCA.'

4.4.11 No change is required with regard to the description of the impact on this HLCA (paragraph 8.6.51 of the March 2016 ES), or the identification of a negligible magnitude of impact resulting in a slight level of effect (paragraph 8.6.52 of the March 2016 ES).

4.4.12 With regard to that part of the March 2016 ES which addresses the potential operational effects on the non-designated HLCAs (paragraphs 8.8.12 – 8.8.51), the following additional text is provided in relation to the additional HLCAs identified.

M4CaN HLCA 131 Graig-y-Saeson

4.4.13 This HLCA is characterised by larger fields with some sinuous boundaries and stands of historic woodland, although smaller fields with straight boundaries are present in the northern part of the HLCA. Much of this HLCA was formerly part of the park associated with Tredegar House; the avenue of trees leading north west from the house crosses the land within the HLCA and is a prominent historic landscape element in this area. There are also elements associated with an earlier park surrounding the medieval house at Gwern-y-Cleppa. Activity has been traced back as far as the Neolithic, with the Gwen-y-Cleppa chambered tomb. An earthwork enclosure, possibly a small Iron Age hillfort, is present Graig-y-Saeson (also known as Coed-y-Defaid) and together with a similar example 2 km to the west at Pen-y-Lan demonstrates that this was a defended landscape with an early settlement pattern. A medium value has been ascribed to this HLCA.

4.4.14 The proposed new section of motorway would be located some distance to the west of this HLCA (approximately 800 metres) and the magnitude of impact is considered to be no change, resulting in a neutral significance of effect.

M4CaN HLCA 132 Llanwern Park

4.4.15 This area comprises the former parkland associated with Llanwern House. The woodland planting installed within the park has grown unchecked in several places to become blocks of mature woodland. These are separated by an area of grassland with some designed tree planting still present. In the north western part of the HLCA are large fields with mostly straight boundaries. Llanwern House has been demolished and replaced with a modern residential dwelling, whilst the former ornamental and kitchen gardens have also been removed. A medium value has been ascribed to this HLCA.

4.4.16 The proposed new section of motorway would be located some distance from this HLCA (approximately 1.8 km) and on the other side of the operational part of the steel works. The magnitude of impact is considered to be no change, resulting in a neutral significance of effect.

M4CaN HLCA133 Bishton and Llanwern

4.4.17 There are historic linear settlements in the western part of the HLCA (Llanwern) and in the eastern part (Bishton). In the northern part is the modern settlement of Underwood, constructed in former farmland adjacent to the historic woodland known as Great Wood and The Routs Wood. There are also dispersed farmsteads and churches which are distinctly separate from the settlements. Field boundaries are a mixture of straight and slightly sinuous, with fields generally large or medium. One exception to this pattern is in the very southern part of the HLCA where there is a small area of fen-edge on either side of Oxleaze Reen. A medium value has been ascribed to this HLCA.

4.4.18 The proposed new section of motorway would be located some distance from this HLCA (approximately 1.3 km) and on the other side of the steel works and the current redevelopment of the works. The magnitude of impact is considered to be no change, resulting in a neutral significance of effect.

M4CaN HLCA134 Llandevaud

4.4.19 There are dispersed farmsteads throughout the HLCA including several in the very eastern part. The modern settlement at Llandevaud is based around a historic farmstead and an area of common land with some former settlement. Field boundaries are predominantly straight with fields generally large or medium, indicating post-medieval reorganisation of the landscape. The main exception to this pattern is in the western part of the HLCA where several of the field boundaries are sinuous; this may reflect a landscape that has retained more of the medieval layout. A medium value has been ascribed to this HLCA.

4.4.20 The proposed new section of motorway would be located some distance to the south of this HLCA (approximately 800 metres) and the magnitude of impact is considered to be no change, resulting in a neutral significance of effect.

M4CaN HLCA135 Langstone

4.4.21 There is considerable modern development in the southern and eastern parts of the HLCA, along either side of the A48 road. This includes hotels and retail/business developments close to Junction 24 of the existing M4 motorway, along with residential developments at Langstone and Llanbedr further east along the M48 road. Prior to this development, the settlement pattern was one of dispersed farmsteads. Some agricultural land has been retained in the northern part of the HLCA. Field boundaries are predominantly straight with fields being medium to large in size. A low value has been ascribed to this HLCA.

4.4.22 The proposed new section of motorway would be located a considerable distance to the east of this HLCA (approximately 3.8 km) and the magnitude of impact is considered to be no change, resulting in a neutral significance of effect.

M4CaN HLCA136 Celtic Manor Resort

4.4.23 Virtually all of this HLCA is occupied by the golf courses and associated development of the Celtic Manor Resort. It has been heavily landscaped although some blocks of historic woodland have been incorporated into the development. Some agricultural land has been retained in the south eastern part

of the HLCA, adjacent to Priory Farm. A low value has been ascribed to this HLCA.

4.4.24 The proposed new section of motorway would be located a considerable distance to the east of this HLCA (approximately 5.7 km) and the magnitude of impact is considered to be no change, resulting in a neutral significance of effect.

Photomontages

4.4.25 Some additional photomontages have been provided. In addition, a number of the photomontages produced for the Scheme have been updated to reflect modifications to the Scheme design. The updated and new photomontages are provided at Figure R9.11 of this ES Supplement. Effects in relation to heritage receptors are considered in Part D of this ES Supplement.

Summary of Effects

4.4.26 Additional work has identified that there would be a permanent large adverse effect resulting from the loss of much of the Second World War barrage balloon site at Pye Corner and the change within the setting of the remaining part of this site.

4.4.27 The identification of additional HLCAs does not change the number of HLCAs experiencing direct effects as a result of the proposed new section of motorway.

4.5 Landscape and Visual Effects

4.5.1 Updated guidance from Natural Resources Wales (NRW) for the use and interpretation of LANDMAP (Landscape Assessment and Decision Making Process) has become available since publication of the March 2016 ES.

4.5.2 Additional photomontages have also been produced to further inform the assessment.

4.5.3 The consequences of the additional information set out above have been considered in this section.

Updated LANDMAP Guidance

4.5.4 Since publication of the March 2016 ES, NRW have updated their guidance for the use and interpretation of LANDMAP (NRW, 2016a, b). LANDMAP is an all-Wales landscape resource where landscape characteristics, qualities and influences on the landscape are recorded and evaluated and was used in evaluating the baseline situation. It has been confirmed by the author of the guidance that there are no changes to the guidance that would have affected the way the LANDMAP data have been used and interpreted within the March 2016 ES.

Additional Representative Viewpoints

4.5.5 Since the publication of the March 2016 ES, a number of additional representative viewpoints have been identified. An assessment of the effects on these viewpoints during construction and operation is provided in this section. The locations of the viewpoints are shown on Figure R9.9. The additional photomontages are presented in Figure R9.11.

Potential Construction Visual Effects on Representative Viewpoints

4.5.6 Viewpoint A1: This is located on the B4239, Lighthouse Road, at Duffryn, at the junction with Duffryn Drive. The view looks to the east-south east, across the playing fields and Wentlooge Levels, towards the River Ebbw and the docks. Pylons are visible across this view and structures of the Docks are just visible above the lines of vegetation. Wind turbines and chimneys on the east bank of the River Usk are also just perceptible in the distance. This viewpoint would allow views of engineering and earthworks in the middle distance, beyond lines of existing vegetation, associated with the embankments of the proposed new section of motorway. There would also be views of the civil engineering works for the construction of the proposed River Ebbw Underbridge and the River Usk Crossing. The construction of the taller elements of the River Usk Crossing in particular, would also be visible above the existing vegetation. This viewpoint would experience a temporary slight adverse significance of effect due to the visibility and nature of the construction area.

4.5.7 Viewpoint A4: This is located on the footpath to the north west of Parc Golf Course, west of Ty'n-y-brwyn. The view looks north across a flat arable field, which rises towards the A48 and the wooded slopes of the embankments and cuttings of the existing M4. The viewpoint is in close proximity to the new section of motorway as it joins the existing M4. Extensive woodland clearance in this area to enable the works would create clear, direct and short range views of the construction areas. The elevation of the Castleton Interchange and the embankments of the new section of motorway may offer clear views of the earthworks, embankment construction and grading, plus the civil engineering works for the structures of the interchange. This viewpoint would experience a temporary large adverse significance of effect due to the visibility and nature of the construction area.

4.5.8 Viewpoint A5: This is located on the track, forming part of the Sirhowy Valley Walk and Wales Coast Path, between the B4239 Lighthouse Road and New Dairy Farm, to the south of the railway and north of the proposed new section of motorway. The view looks to the south east, across the flat Levels landscape, with meadows either side, and linear scrub following the field boundary to the east and drains following those to the west. The view shows lines of pylons crossing the landscape, with the structures of the docks in the middle distance beyond the River Ebbw. This viewpoint would allow views of major civil engineering and earthworks associated with the proposed New Dairy Farm Overbridge and the embankments of the proposed new section of motorway. There would also be views of the civil engineering works for the construction of the proposed River Ebbw Underbridge and there would be clearance of ditch-side and low vegetation as a result of these operations. The construction of the taller elements of the proposed River Usk Crossing would also be seen beyond the embankments of the proposed new section of motorway, amongst the existing taller industrial elements within and around the docks area, including chimneys, turbines and pylons. This viewpoint would experience a temporary very large adverse significance of effect due to the visibility and nature of the construction area.

4.5.9 Viewpoint A6: This is located on the edge of the housing area in Newport, at Gaer, next to and to the south east of Tredegar Camp on the higher ground looking towards the River Usk, the Severn Estuary and Newport Docks. This

residential area is too densely developed to accurately assess exactly which properties would have views of the proposed new section of motorway and which would not. The zone of theoretical visibility (ZTV) provides an indication of the areas affected. Generally the areas where the topography is steeper would allow for receptors to see above the properties in front, and where houses are orientated towards the proposed new section of motorway would have the greater effect on visual amenity. There would be a perceptible change in the views available to many of this receptor group. Where construction areas are visible, there would be long distance views of some stretches of the new section of motorway and of the bridge construction over the Docks and the Rivers Ebbw and Usk. The expansive nature of the views, however, and the intermittent screening from other properties, would reduce the dominance of the construction elements within the view, and the significance of effect would therefore be limited. This would result in a temporary slight adverse significance of effect.

4.5.10 Viewpoint A7: This viewpoint is located at Tatton Farm, on the track to the south of the farm. The view looks to the south-south east across the flat meadows. Drains cross the meadows, with scrub and tall ruderals following the lines of these drains in the foreground, and taller shrubs and trees following the main double drain and around Yewtree Farm to the south, then following the road (Broad Street Common) beyond this. Tatton Farm is no longer occupied and, as such, there would be no residential receptors at this location. Details of the effect on the listed building in terms of heritage (in relation to the proposed changes to the Environmental Masterplans at Tatton Farm) are considered in Section 5.

Assessment of Potential Operational Visual Effects on Representative Viewpoints

Year 1

4.5.11 Viewpoint A1: Lighthouse Road / Duffryn Drive: This viewpoint looks across the flat Levels landscape, towards the Newport Docks area and the industrial area to the east of the River Usk. This viewpoint would allow views of proposed new section of motorway embankments in the middle distance, plus the vertical elements such as signage, gantries and lighting, plus the moving traffic. Beyond the new section of motorway, the chimneys, wind turbines and Docks structures are visible along the skyline, with the more dominant lines of pylons in front of the motorway. The vertical motorway elements would blend with these other features in the view, thereby adding to the cluttered skyline. Lines of existing vegetation, in front of the motorway, would help screen the bare motorway embankments until the grass and scrub covers and softens the engineered profile of the earthworks. This viewpoint is therefore assessed as having a slight adverse significance of effect on visual amenity.

4.5.12 Viewpoint A4: West of Ty'n-y-brwyn: This viewpoint would experience a very large adverse significance of effect during Year 1 due to the visibility and nature of the proposed new section of motorway and the structures of the Castleton Interchange. The new section of motorway would run in close proximity to the viewpoint and, coupled with the extensive removal of woodland as part of the construction works, this would result in clear, direct and short range views onto the bare embankments and the elevated structures. At this time, any new planting would not be sufficiently established to make any screening impact and the elevated structures would form the skyline to the north.

4.5.13 Viewpoint A5: Sirhowy Valley Walk and Wales Coast Path: This viewpoint would experience a very large adverse significance of effect during Year 1 due to the proximity of major earthworks, the proposed New Dairy Farm Overbridge and extensive areas of tarmac. There would also be views of the approaches to the proposed River Ebbw Underbridge and the high structures of the River Usk Crossing would also be evident. Vegetation clearance would also make the bare earth of the embankments of the new section of motorway clearly visible. Vertical elements such as signage, gantries and lighting would also be clearly visible.

4.5.14 Viewpoint A6: Residential area south east of Tredegar Camp: This viewpoint is located in an elevated part of the city and offers extensive views across the Docks and the Severn Estuary. Clear and far reaching views would remain in Year 1 and there would be clear views of the proposed new section of motorway and its structures, particularly where it crosses the Docks area. The towers of the proposed River Usk Crossing would stand out against the sky and estuary beyond, adding to the number of vertical elements associated with the Docks and industrial areas to the east of the River Usk. These new features would not, however, alter the overall balance of features within the landscape and the addition of the River Usk Crossing would add to the features considered as being iconic to Newport, the Transporter Bridge and the Southern Distributor Road (SDR). This viewpoint is therefore assessed as having a slight adverse significance of effect on visual amenity.

4.5.15 Viewpoint A7: Tatton Farm: As set out above, there are no residential receptors at this location.

Year 15

4.5.16 Viewpoint A1: Lighthouse Road / Duffryn Drive: This viewpoint looks over elements of the new section of motorway which cannot be fully mitigated. It is therefore considered to have the same slight adverse significance of effect in Year 15 as in Year 1.

4.5.17 Viewpoint A4: West of Ty'n-y-brwyn: By Year 15, the planting would have time to mature and there would be an element of screening to the embankments below the Castleton Interchange and of woodland covering the cuttings above the motorway. This latter would also form a wooded skyline above the elevated structures, disguising the profile of the elevated structures. Vertical elements such as signage, gantries and lighting may still be visible, resulting in a large adverse significance of effect.

4.5.18 Viewpoint A5: Sirhowy Valley Walk and Wales Coast Path: This area has little opportunity for mitigation in the form of planting as, due to the flat and open nature of the landscape, extensive planting would not be appropriate and would be likely to emphasise the new section of motorway rather than integrate it within the landscape. Embankments to the new overbridge would provide an opportunity for localised mitigation planting, in the form of native shrubs, to visually soften the engineered appearance of the earthworks and blend them with the immediate surrounding landform and scrub vegetation. There would therefore be very localised screening of the new section of motorway for users of the right of way at this viewpoint, although views from further along the route would not benefit from this screening. The viewpoint, and locations further along the right of way, would therefore continue to experience a very large significance of effect during year 15 due not only due to the presence of the new section of

motorway, but also due to the introduction of blocks of vegetation in locations out of character with the surrounding landscape.

4.5.19 Viewpoint A6: Residential area south east of Tredegar Camp: This viewpoint looks over elements of the new section of motorway which cannot be fully mitigated. It is therefore considered to have the same slight adverse significance of effect during Year 15 as in Year 1.

4.5.20 Viewpoint A7: Tatton Farm: As set out above, there are no residential receptors at this location.

4.6 Ecology and Nature Conservation

4.6.1 The following information has become available since publication of the March 2016 ES.

- Updated guidance produced by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2016).
- Additional information relating to Sites of Special Scientific Interest (SSSIs) provided by NRW.
- Additional environmental information arising from new surveys and desk based research.

Updated CIEEM Guidance

4.6.2 As stated in paragraph 10.3.2 of the March 2016 ES, CIEEM issued updated Guidelines for Ecological Impact Assessment (CIEEM, 2016) in January 2016. These guidelines update the previous version (CIEEM, 2006).

4.6.3 Publication of the updated guidance occurred too late to be considered for the purposes of the ecological assessment (which had been completed using the 2006 guidelines). Since publication of the March 2016 ES, the updated guidance has been reviewed. The 2016 guidance has clarified and amplified the previous guidance in some areas, particularly with regard to establishing the baseline; assessment of cumulative impacts; and the approach to avoidance, mitigation, compensation and enhancement. The updated guidance also refers to the role of ecologists in ecosystem services assessments in providing the relevant data to inform the assessments of social and economic value. However, the overall approach to ecological impact assessment set out within the guidance has not changed significantly from that of CIEEM (2006), which was taken into account in the assessment methodology set out in Chapter 10 of the March 2016 ES. Accordingly, the conclusions set out in the March 2016 ES do not need to be reassessed in light of the new guidance.

Updated Information from NRW

4.6.4 Paragraphs 10.4.13 to 10.4.29 of the March 2016 ES summarise the important features of the Gwent Levels SSSIs based on the citations and site management statements. Subsequent to issue of the ES, NRW provided SSSI Feature Sheets for these SSSIs. The SSSI Feature Sheets are attached at Appendix S10.2 and the important features of those SSSIs that would be crossed by the proposed new section of motorway are summarised in Table 1 of Appendix S10.2 alongside the features previously referred in ES Chapter 10 for comparison.

4.6.5 It can be seen that the key features of the Gwent Levels SSSIs as set out in ES Chapter 10 based on the Site Management Statements and citations available at that time (comprising reen and ditch habitat, and a range of aquatic and marginal plant species, aquatic invertebrates and shrill carder bee) are essentially as set out in the SSSI Features Sheets, although there are differences in the lists of key plant and invertebrate species between the individual SSSIs.

4.6.6 NRW have confirmed that shrill carder bee is a qualifying feature of the following sites.

- Gwent Levels: Rumney and Peterstone SSSI.
- Gwent Levels: St Brides SSSI.
- Gwent Levels: Nash and Goldcliff SSSI.
- Gwent Levels: Whitson SSSI.
- Gwent Levels Redwick and Llandevenny SSSI.
- Gwlyptiroedd Casnewedd/ Newport Wetlands SSSI.

4.6.7 There are also populations within Gwent Levels: Magor and Undy SSSI and Magor Marsh SSSI, but these are not regarded as of qualifying status at present, although it is recognised that they are likely to be part of the same meta-population as the other Gwent Levels SSSIs.

4.6.8 NRW have advised that the Gwent Levels SSSIs Condition Assessments are still being finalised on the basis of their own survey information collected over the last few years. However, they have advised that preliminary draft analysis indicates that most features are likely to be classified as 'unfavourable'. The main causes of unfavourable condition are the combination of a lack of in-channel submerged vegetation, an over-dominance of terrestrial vegetation and the lack of bare ground/poaching across the SSSIs.

4.6.9 As the data form a baseline survey, NRW are not able at this stage to assess whether the features should be classified as 'Unfavourable Declining' or 'Unfavourable Improving'.

4.6.10 NRW have also provided the following reports of surveys of the Gwent Levels for Shrill carder bee.

- The Status of the Shrill Carder Bee *Bombus sylvarum* on the Gwent Levels. CCW Contract Science Report No. 623 (Pavett, P. M., 2004).
- The Status and Distribution of the Shrill Carder Bee *Bombus sylvarum* on the Eastern Gwent Levels and within the Caerwent and Caldicot areas of Gwent in 2010. CCW Contract Science No 972 (Smith, M. N., 2011).
- The distribution of the shrill carder bee *Bombus sylvarum* on the Gwent Levels, 1998 to 2010 (Howe, M., 2012).

4.6.11 Howe (2012) (attached at Appendix S10.3) summarises the findings of Pavett (2004) and Smith (2011) and other surveys of the Gwent Levels and adjoining areas for shrill carder bee following the first record in 1998. These surveys have shown that the shrill carder bee is widespread across the Levels, with particularly strong populations on the Newport Wetlands Reserve. Numbers are much reduced towards the eastern end of the Levels (from Magor to Chepstow). The

species is mostly associated with the reens, road verges, field margins and sea wall where there are abundant pollen sources.

4.6.12 Howe (2012) recommends that the conservation efforts for the shrill carder bee within the Gwent Levels should be focussed on promoting sympathetic management of the reens, road verges, field margins and sea wall. This management should ensure an abundant supply of forage plants such as common knapweed *Centaurea nigra*, creeping thistle *Cirsium arvense*, narrow-leaved everlasting-pea *Lathyrus sylvestris*, common bird's-foot trefoil *Lotus corniculatus*, red clover *Trifolium pratense*, and tufted vetch *Vicia cracca* from April to September. Attempts should also be made to restore species-rich swards to the many agriculturally-improved pastures on the Levels, initially in areas supporting strong populations of the bee.

Habitat Loss within the Gwent Levels SSSIs

4.6.13 Chapter 10 of the March 2016 ES provided information on the land take across the Gwent Levels SSSIs. Paragraph 10.7.13 stated that the total permanent land take within the Gwent Levels SSSIs would be some 105 hectares (ha), of which 35 ha would be to the west of the River Usk and 70 ha would be to the east. An additional 20 ha would be affected during construction (5.6 ha to the west of the River Usk and 14.4 ha to the east). Paragraph 10.7.14 explained that some 2,568 metres of reens and 9,136 metres of field ditches would be infilled or culverted. Paragraph 10.7.18 stated that the permanent land take would result in the loss of 77.6 ha of grazing marsh (measured as grassland within the SSSIs within the land take of the Scheme) of which 25.3 ha would be to the west of Usk and 52.3 ha to the east.

4.6.14 The detailed breakdown of these figures for each affected SSSI is provided in Table 4.1. The percentage loss of reens and ditches for each SSSI and across the four SSSIs which would be affected is also given.

ES Supplement Table 4.1: Land Take within the Gwent Levels SSSIs

	St Brides	Nash and Goldcliff	Whitson	Redwick and Llandevenny	Total (all affected Gwent Levels SSSIs)
Permanent Loss					
Grassland (grazing marsh)	25.30 ha	15.43 ha	1.92 ha	34.93 ha	77.58 ha
Other land	9.74 ha	12.23 ha	3.16 ha	2.27 ha	27.4 ha
SSSI Area	35.04 ha	27.66 ha	5.08 ha	37.20 ha	104.98 ha
Temporary Loss					
Grassland (grazing marsh)	5.04 ha	1.66 ha	0.32 ha	1.83 ha	8.85 ha
Other land	1.04 ha	9.09 ha	1.11 ha	0.39 ha	11.63 ha
SSSI Area	5.58 ha	10.75 ha	1.43 ha	2.23 ha	19.99 ha
Temporary and Permanent Loss					
Grassland (grazing marsh)	30.34 ha	17.09 ha	2.24 ha	36.76 ha	86.43 ha
Other land	10.78 ha	21.32 ha	4.27 ha	2.66 ha	39.03 ha
SSSI Area	40.62 ha	38.41 ha	6.51 ha	39.43 ha	124.97 ha
Loss of Reens and Ditches					
Total Reens within SSSI	41,523 m	26,455 m	28,388 m	33,674 m	130,040 m

	St Brides	Nash and Goldcliff	Whitson	Redwick and Llandevenny	Total (all affected Gwent Levels SSSIs)
Total Ditches within SSSI	137,160 m	78,301 m	91,998 m	91,794 m	399,253 m
Reens Lost	1,067 m	775 m	65 m	795 m	2,702 m
Ditches Lost	3,762 m	1,464 m	659 m	1,791 m	7,676 m
Loss of Reens %	2.6 %	2.9 %	0.2 %	2.4 %	2.1 %
Loss of Ditches %	2.7 %	1.9 %	0.7 %	2.0 %	1.9 %

Note: An additional 53 metres of reen and 1,697 metres of ditch would be lost outside the SSSIs

Other SSSIs

4.6.15 Figure 10.2 of the March 2016 ES showed the nationally designated sites in the vicinity of the Scheme. These include Ruperra Castle and Woods SSSI and Plas Machen Wood SSSI to the west. Although shown on the plan, these SSSIs are not described in the baseline description at Section 10.4 of the March 2016 ES.

4.6.16 Ruperra Castle and Woods SSSI is of special interest as one of only five known nursery roosts for the greater horseshoe bat (*Rhinolophus ferrumequinum*) in Wales. The buildings at Ruperra Castle support a colony of greater horseshoe bats of national and international importance. A small number of lesser horseshoe bats (*Rhinolophus hipposideros*) also use the cellar of the old castle as a hibernation roost during the winter. Coed Craig Ruperra, the woodland area to the north of the roost, is well used by the bats for foraging and commuting to more distant feeding and roosting areas. Other protected species present at the site include a breeding population of great crested newts (*Triturus cristatus*) and the common dormouse (*Muscardinus avellanarius*).

4.6.17 Plas Machen SSSI is designated for its native broadleaved woodland with associated diverse ground flora. A number of streams and waterlogged areas support an interesting flora that includes plants such as greater tussock sedge (*Carex paniculata*) and yellow flag iris (*Iris pseudacorus*), which are of rare or local distribution in the county.

Additional Survey Work

Winter Bird Survey 2015-2016

4.6.18 The report of this additional survey is provided at Appendix S10.4.

4.6.19 Thomson Ecology undertook additional wintering bird surveys of five transect sections and two vantage points across the Scheme over the period October 2015 to March 2016. These surveys were to supplement the previous surveys undertaken by Arup in early 2015 (March 2016 ES Appendix 10.12) and by Hyder Consulting (UK) Limited over the winter of 2014-15 (March 2016 ES Appendix 10.16).

4.6.20 Hyder Consulting (UK) previously undertook surveys of seven transects. Five of these were within the Gwent Levels and the other two were at the western and eastern ends of the proposed new section of motorway.

4.6.21 By agreement with NRW, this further survey focussed on the Gwent Levels sections of the route. Five wintering bird survey transects were undertaken on a

monthly basis. Qualifying species were recorded, mapped and counted. This was based on the list previously used by Hyder Consulting (UK) Limited in the 2014-15 surveys (March 2016 ES Appendix 10.16). All other species were recorded as incidental records.

4.6.22 The vantage point surveys were undertaken at the River Ebbw and River Usk, also on a monthly basis, between October 2015 and March 2016, inclusive. Raptors, waders, wildfowl and gulls were recorded in flight and all other species were recorded during hourly point counts.

4.6.23 During the transect and vantage point surveys, four Severn Estuary Special Protection Area (SPA) Annex 1 Qualifying Species were recorded: curlew, pintail, redshank and shelduck.

4.6.24 During the transect and vantage point surveys, eight Severn Estuary SPA Assemblage Species were recorded: gadwall, wigeon, lapwing, teal, mallard, shoveler, pochard and tufted duck.

4.6.25 During the transect and vantage point surveys eleven species listed under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) were recorded: pintail, hen harrier, peregrine, black-tailed godwit, green sandpiper, kingfisher, bearded tit, Cetti's warbler, fieldfare, redwing and brambling. These species are afforded additional protection during the breeding season; wintering populations receive no additional protection.

4.6.26 Pond 1 and the nearby reens (ditches) in Section 3 of the transect (TATA) supported several species of waterfowl including peak counts for the survey of pintail, shelduck, gadwall, teal and pochard and lower numbers of shoveler, mallard and tufted duck.

4.6.27 The sludge beds in Section 5 of the transect also supported waterfowl with a pair of shelduck and peak counts of shoveler and tufted duck.

4.6.28 During the vantage point surveys the River Ebbw and River Usk channels were found to be regularly used by commuting gulls. Numbers of redshank, teal and wigeon were recorded at the River Ebbw during both vantage point and transect surveys; with peak counts for the survey of 102 redshank and 43 wigeon.

4.6.29 During transect and vantage point surveys a range of species listed on the Birds of Conservation Concern (BoCC) Red and Amber Lists and under Section 42 of the Natural Environment and Rural Communities (NERC) Act 2006 were also recorded and these are detailed in the report. Incidental species recorded included buzzard and sparrow hawk.

Breeding Bird Survey 2016

4.6.30 The survey report is presented in Appendix S10.5 of this ES Supplement.

4.6.31 Two types of survey were carried out; breeding bird surveys and species-specific surveys for Cetti's warbler. These surveys were both carried out between April and June 2016.

4.6.32 The species recorded and the numbers they were recorded in during the breeding bird surveys are considered fairly typical for such habitats. No species named on Annex I of the Birds Directive were recorded within the study area. Two species named in Schedule 1 of the Wildlife and Countryside Act (1981)

were recorded; black-tailed godwit and Cetti's warbler, with no breeding evidence of the former species recorded. In total, up to 49 Cetti's warbler territories were recorded in the species-specific study area.

4.6.33 Five qualifying species of the Severn Estuary SPA or Ramsar site (dunlin, shelduck, shoveler, herring gull and lesser black-backed gull) were recorded during breeding bird surveys, though none of these species were recorded showing behaviour associated with breeding.

4.6.34 Following records of common cranes in the Gwent Levels in 2014 and 2015, the M4CaN team recorded the species in 2016. The survey information has been shared with NRW but remains confidential.

Dormouse Survey 2016

4.6.35 Nest tube surveys to the east of the River Usk that were commenced in 2015 are continuing in 2016 in order to obtain a greater coverage of survey areas and provide additional data to support likely absence or inform population distribution and size estimates. In order to increase survey effort at the eastern end of the proposed new section of motorway, additional nest tubes were also installed in 2016 in a small parcel of woodland in Knollbury, to the north of the M4 and Undy (Gwndy), which provided habitat of potential value to dormice; additional nest tubes were also installed in scrub between the M4 and A48(M) at Junction 23 of the M4.

4.6.36 During the 2015 ecology desk study and hazelnut searches of off site woodland parcels, Coed Mawr, an NRW owned woodland to the north of the western end of the proposed new section of motorway, was highlighted as being of potential value to dormice. Therefore, a habitat assessment and nest tube survey are being undertaken in 2016 in order to help determine the presence or likely absence of dormice in the wood and to inform an assessment of the value of the wood as a potential receptor site for dormice that may require translocating from the development site.

4.6.37 To date no signs of dormice presence have been recorded during the 2016 surveys. A full report will be published in due course.

Otter Survey 2016

4.6.38 An otter survey of the landfill site to the east of the River Ebbw has been completed during 2016. Many of the areas shown on aerial imagery as being of potential value to otters have been infilled and/or are located within the areas of disturbance on site. Therefore, although the land may occasionally be used by otters (e.g. foraging for fish in ponds in the area), it is unlikely to have potential for a maternal or nursery holt due to the level of disturbance and limited vegetation cover.

Great Crested Newt Survey 2016

4.6.39 The results of this survey are presented in full in Appendix S10.6 of this ES Supplement.

4.6.40 The 2016 great crested newt presence absence (eDNA technique) survey was carried out over the period of mid-May until the end of June 2016, which falls

within the optimum period for this type of survey. The survey method was based on that described in Biggs *et al*. (2014).

4.6.41 Population Size Class Estimate Surveys and Presence / Absence Surveys (traditional methods) were undertaken from 11th April to 16th June, which falls within the optimum period for this type of survey. The survey method was based on that described in The Great Crested Newt Mitigation Guidelines (English Nature, 2001).

4.6.42 The 2016 surveys fell into two categories as follows.

- Four areas within 250 metres of the proposed new section of motorway that was not surveyed during 2015.
- All watercourses within 250 metres of the location of positive eDNA results identified during the 2015 eDNA sampling.

4.6.43 Watercourses not covered during the 2014 Arup (March 2016 ES Appendix 10.6) or the 2015 eDNA survey (March 2016 ES Appendix 10.22) were visited during March / April 2016 to assess them in terms of accessibility (i.e. dense vegetation over watercourses) and in terms of the safety of surveyors (i.e. steep banks and / or deep water). Habitat Suitability Index (HSI) scores from the 2014 Arup Phase 1 Survey (March 2016 ES Appendix 10.2) were taken into account when assessing each watercourse. Four areas were surveyed.

- TATA Steel Land.
- Adjacent to the eastbound carriageway of the existing M4 north of Undy.
- Adjacent to the westbound carriageway of the existing M4 north of Undy.
- Within Marshall Land on the east bank of the River Usk.

4.6.44 Watercourses within 250 metres of the locations of positive 2015 eDNA were identified. Three locations of positive eDNA results were identified during the 2015 eDNA sampling including the following.

- The Bareland Street area south of Llandevenny;
- Land to the east of Tonew Kennels; and
- Land south of Tatton Farm.

4.6.45 A total of 210 watercourses were assessed. Of these, details were as follows.

- A total of 105 watercourses were identified for survey.
- A total of 94 watercourses were found to not provide suitable habitat for Great Crested Newts at the time of the survey; and
- A further eleven watercourses were not suitable for survey because they were inaccessible, either due to barriers preventing access or due to health and safety reasons.

4.6.46 No great crested newts were found using traditional survey methods.

4.6.47 Great crested newt DNA was detected at the same locations as in 2015 (March 2016 ES Appendix 10.22). In addition, great crested newt eDNA was detected at

one location where not previously detected. This was in a watercourse adjacent to the location where three individual great crested newts were found underneath reptile survey mats during the 2015 Reptile Survey (March 2016 ES Appendix 10.27).

4.6.48 Based upon the traditional survey data and the eDNA data results, it is considered that a small population is present within the 2016 survey areas, and that where they are present the great crested newts are in small, potentially isolated pockets. The presence of populations of predatory fish and the availability of habitat suitable for great crested newt, with no extensive 'fish-free' areas within which a significant and sustainable metapopulation of great crested newt could exist, is likely to be a significant constraint on the population within the vicinity of the proposed new section of motorway and more widely within the Gwent Levels.

Bat Hibernation Roost Survey 2016

4.6.49 The full results of this survey are presented in Appendix S10.7.

4.6.50 In 2015, ground level inspections were carried out of 36 trees and a building identified as being of high potential for bat roosts within 250 metres of the proposed new section of motorway and/or proposed construction compounds. These were followed by tree climbing inspections of 23 trees which were accessible and/or safe to climb. Dusk emergence and dawn return to roost bat surveys of 16 of the trees/building confirmed to have high potential following the tree inspections were undertaken within the footprint of the proposed new section of motorway.

4.6.51 During the climbing inspection survey, two trees (T38 and T62) and one building (T335) were assessed as having potential to support hibernating bats. A bat hibernation roost survey to inspect for use by hibernating bats was recommended.

4.6.52 In February 2016, hibernation roost inspections were undertaken of two trees (T38 and T62) and one building (T335) using tree climbing and ground inspection to search for bats, or evidence of bats.

4.6.53 No bats or evidence of bats were found during the hibernation inspections of T38, T62 and T335, although the features present on T38, T62 and T335 still have the potential to support hibernating bats.

Bat Emergence Surveys 2016

4.6.54 The following additional building surveys are being undertaken in 2016: Undy House; Dunline; Knollbury; Barecroft House; Pye Corner (derelict building); Pye Corner House; Fair Orchard Farm buildings; Berryhill Farm buildings; Berryhill Cottage; The Beeches; Myrtle House; The Old Rectory; San Remo; The Glen; White Cottage; and The Conifers. To date, a number of small pipistrelle bat roosts have been located in some of the buildings.

4.6.55 The following trees are also being/have been surveyed in 2016 for roosting bats. Surveys of these trees are being undertaken in order to complete surveys commenced in 2015: T38, T39, T62, T80, T82, T88, T273, T274, T328, T331, T335, T346, T358, T359, T375 and T390 and trees of high potential value to bats

on the Tata Steel site to the south of the A4810. These trees are shown on Figure 1 of Appendix 10.24 of the March 2016 ES.

4.6.56 Survey results to date have identified: a roost for small numbers of long-eared bat and common pipistrelle bats in tree T80; roosts of small numbers of unidentified bat species in trees T274 and T375; and potential small bat roosts in trees T39 and T45.

4.6.57 A full report will be published in due course.

Conclusion

4.6.58 These additional surveys have provided further confirmation of the ecological features in the vicinity of the proposed new section of motorway and the assessment of significance of effects remains as set out in the March 2016 ES. An updated summary significance table is provided in Appendix S10.8.

4.7 Geology and Soils

4.7.1 The following information has become available since publication of the March 2016 ES.

- Updates to the Environmental Permitting Regulations.
- Updates to Appendix 11.1 of the March 2016 ES and its supporting Contaminated Land (CL) annexes to take into account further ground investigation undertaken during 2016.

4.7.2 The consequences of the additional information have been considered in this section.

Environmental Permitting Regulations

4.7.3 The Environmental Permitting Regulations have been extended to include Flood Defence Consenting. These changes came into force on 6th April 2016. The amended regulations introduce Flood Risk Exclusions and Flood Risk Exemptions, which mean that certain activities will be permitted in, over, under or adjacent to a main river without charge and without needing a permit, providing certain conditions are met. All remaining activities will require a bespoke Flood Risk Activity Permit (previously a Flood Defence Consent).

4.7.4 This would not affect the significance of effects reported in the March 2016 ES. However, the text at paragraph 3.1.8 of Appendix 11.5 of the March 2016 ES is updated as follows.

4.7.5 The Flood Risk Activity Permit application will require the relevant supporting documentation listed below (this list is not exhaustive).

- Application Forms.
- Location Plan of the proposed works.
- Description and purpose of the proposed works.
- Plans and sections.
- Detailed drawings/Construction details.

- Method statement to cover the construction phases of the works e.g. Temporary Works.
- Water Framework Directive Assessment (if required by NRW).
- Maintenance of works/structure(s) during and upon completion.

Contaminated Land

4.7.6 Appendix 11.1 of the March 2016 ES provided an appraisal of potential areas of land contamination likely to be affected by the proposed new section of motorway (Appendix 11.1 of the March 2016 ES). This was supported by individual land contamination assessment reports for each site potentially affected.

4.7.7 A subsequent phase of ground investigation has been undertaken since the publication of the March 2016 ES. The additional data have been used to update Appendix 11.1 and the relevant supporting individual land contamination assessment reports. These are provided at Appendix R11.1.

4.7.8 The objective and scope of the additional ground investigation were as follows.

- To supplement the existing ground investigation data set in locations along the route of the proposed new section of motorway where only limited geotechnical data existed to support the geotechnical design and to reduce uncertainty in the ground conceptual model of the Scheme. The scope of work included drilling boreholes and undertaking detailed site geotechnical testing in positions of key structures.
- To provide further data on known and potential areas affected by contamination to verify risk levels identified in the March 2016 ES.

4.7.9 The data from the 2016 Additional Ground Investigation have been reviewed and 18 sites of potential land contamination have been subject to further assessment as set out in Table 4.2 below.

ES Supplement Table 4.2: Additional Investigation Undertaken

Site Name	Additional Investigation Undertaken					
	Boreholes	Window Samples	Trial Pits	Soil Analysis	Groundwater Analysis	Gas Monitoring
CL-2 Former Construction Storage Compound	0	3	0	No	No	No
CL-3 Pound Hill	0	0	2	Yes	No	No
CL-4 Cefn Llogel Farm	0	0	3	Yes	No	No
CL-6 Radiator Manufacturers and Adjacent Land	0	1	5	Yes	No	No
CL-8 Former Railway Bridge	0	0	2	Yes	No	No
CL-10 Made Ground	0	1	1	Yes	No	No
CL-13 Docks Way Landfill	2	0	0	Yes	Yes	Yes
CL-14 Newport	13	0	2	Yes	Yes	Yes

Site Name	Additional Investigation Undertaken					
	Boreholes	Window Samples	Trial Pits	Soil Analysis	Groundwater Analysis	Gas Monitoring
Docks (includes CL-16 Infilled River Ebbw)						
CL-15 Stephenson Street Industrial Estate (includes CL-20 Mir Steel Works and Waste Disposal Site)	13	1	0	Yes	Yes	Yes
CL-16 Infilled River Ebbw (included in CL-14 above)						
CL-17 Solutia Chemical Works	3	6	3	Yes	Yes	Yes
CL-18 River Usk Pier Location	2	0	0	Yes	No	No
CL-20 Mir Steelworks and Associated Waste Disposal Site (included in CL-15 above)						
CL-26 Llanwern Steel Works – Reedbed 1 and Metal Recovery Areas (main alignment)	9	2	3	Yes	Yes	Yes
CL-26 Llanwern Steel Works - Including Lagoons Areas	5	0	0	Yes	Yes	Yes
CL-27 Elver Pill Reen and Green Moor Landfill	1	7	2	Yes	Yes	Yes
CL-30 Green Moor Quarry Landfill	0	2	0	Yes	No	Yes
CL-33 B4245 Quarry	0	2	0	Yes	No	Yes

4.7.10 The updates have taken account of additional information collected during the 2016 Additional Ground Investigation including review of field observations of soils and rocks encountered in excavations, evidence of any visual or olfactory contamination, gas and groundwater monitoring results and laboratory chemical analysis results of soil and water samples. The review and assessment of new data has included updates, where necessary, of the following.

- Update of human health risk assessment and controlled water assessment and gas risk assessment.

- Review and update where necessary of conceptual site models for each of the 18 land contamination sites and the conceptual site model outside the 18 sites.
- Update of risk levels associated with identified potential contaminant linkages where necessary.
- Update of conclusions and recommendations on the need for further assessment or remedial action.

4.7.11 A summary of the key findings of the 2016 Additional Ground Investigation is set out below.

- Localised asbestos finds within shallow soils encountered within CL-17.
- Localised area of hydrocarbon contaminated soils, perched groundwaters and deeper aquifer identified at the southern end of the proposed Docks Way Link Road within CL-14.
- Elevated ground gases identified in the vicinity of the PCB cell located within CL-17.
- Localised occurrences of hazardous ground gases (hydrogen sulphide and carbon monoxide) identified within lagoons located within CL-26.

4.7.12 The update of the Land Contamination Assessment Report (Appendix 11.1 of the March 2016 ES and Appendix R11.1 of this ES Supplement) has also enabled the Outline Remediation Strategy Report to be updated (Appendix R11.2). In general terms the strategy for remediation remains the same. However, the 2016 Additional Ground Investigation data have enabled the extent of contamination requiring remediation to be refined as a consequence of reducing the uncertainty in the extent and level of contamination along the proposed new section of motorway.

4.7.13 Furthermore since publication of the March 2016 ES, consultation with NRW and also Tata has continued, in order to discuss further detail of the remediation strategy and considerations that will be needed during the future detailed design. Following a meeting on 20th July 2016 with NRW, the remediation approach being proposed was agreed in principle by NRW subject to further details being provided. It has been agreed that the outline remediation strategy report and outline materials management plan would be updated and agreed with NRW prior to construction commencing. Similarly the works and documentation necessary to enable the various existing environmental permits affected by the proposed new section of motorway requiring partial surrender and / or variation would be agreed with permit holders and NRW and the Environmental Permitting Strategy Report at Appendix 11.4 of the March 2016 ES would be updated in agreement with NRW prior to construction commencing.

4.7.14 The potential risk of pollution of surface waters or groundwater during and after the installation of band drains beneath the highway embankment has also been evaluated further since the March 2016 ES was published. The risk from band drains enabling contaminants and saline (brackish) groundwater to enter surface waters is also described within Chapter 16 of the March 2016 ES. The further evaluation has provided increased confidence in the lack of a valid and relevant additional pathway between contaminants in soils and groundwater that would lead to a significant increase in potential contaminants entering surface waters. Similarly the increase in any potential contaminants in perched water migrating

downwards via band drains and entering the secondary aquifers causing an appreciable deterioration in groundwater quality is considered negligible. Furthermore the aquifer beneath the Tidal Flat Deposits is considered poor, is not an important water resource and is not in hydraulic continuity with wider surface water.

4.7.15 The 2016 Additional Ground Investigation information has enabled the risk levels assigned to each of the sites of potential land contamination to be refined. The overall risk levels for these sites are set out below, which supersedes Table 11.9 in the March 2016 ES.

ES Supplement Table 4.3: Overall Risk

Site Name	Potential Contaminant Source	Potential Contaminants of Concern	Potential Receptors	Risk Range (lowest – highest)	Key Potential Contaminant Linkages
CL-1 Castleton Interchange Spoil Heaps	Spoil heaps; from flytipping and marshy soils [1]	Heavy metals and hydrocarbons. Possible ground gas.	Human health, Secondary A aquifer, surface waters	Very low - Low	None identified.
CL-2 Former Construction Storage Compound	Leaks/ spillages [1]	Possible hydrocarbons	Human health, Secondary A aquifer	Very low - Low	None identified
CL-3 Pound Hill	Backfilled quarry pit	Various possible- none identified	Human health, Secondary A aquifer, surface water drainage	Very low – Low	None identified
CL-4 Cefn Llogel Farm	Possible inert waste associated with landfill [1] (not identified on site)	None identified	Human health, surface waters	All contaminant pathways removed.	None identified.
CL-5 Church Road	Buried fly-tipping	Elevated hydrocarbons in soils, Heavy metals in groundwater	Human health, Secondary A and B aquifers, surface water drainage	Very low – Low	None identified
CL-6 Radiator Manufacturers and Adjacent Land	Made Ground, contaminated groundwater, peat	Ground gas associated with peat; Potential contaminants within the Made Ground, alkaline soils.	Human health, Secondary A and B aquifers, surface waters	Very low – High	Risk of potential ground gas (explosion) to construction workers.
CL-8 Former Railway Bridge	Made Ground	Various possible – none identified	Human health/ groundwater aquifers, surface waters	Very low – Low	None identified

Site Name	Potential Contaminant Source	Potential Contaminants of Concern	Potential Receptors	Risk Range (lowest – highest)	Key Potential Contaminant Linkages
CL-9 Green Lane Landfill	Waste from historic landfilling, peat	Heavy metals, organic and inorganic contaminants, ground gas	Human health/ groundwater aquifers, surface waters	Very low - Moderate	Risk of potential ground gas (explosion) to construction workers.
CL-10 Made Ground	Made Ground	Limited information. Various possible including heavy metals and hydrocarbons though indicated to be predominantly inert	Human health/ groundwater aquifers, surface waters	Very low – Low	None identified
CL-13 Docks Way Landfill	Made Ground, peat (Scheme land take excludes landfill areas) (Landfilled material extending beyond Site boundary considered in CL-14 Newport Docks).	Heavy metals, organic and inorganic contaminants, asbestos and ground gas.	Human health, Secondary B aquifer, surface waters	Very low – High	Elevated ground gas (explosion) to construction workers during piling. Piling and construction affecting current gas regime leading to risks to adjacent properties. Surface water run-off from the construction area to surface waters.
CL-14 Newport Docks	Various industrial usage, peat, historical landfilled material associated with Docks Way landfill.	Various possible including heavy metals, organics/ inorganics, asbestos and ground gas.	Human health, Secondary B aquifer, surface waters	Very low – Moderate	Hydrocarbon and inorganic impacted soils impacting on construction workers. Elevated ground gas (explosion) to construction workers during piling.

Site Name	Potential Contaminant Source	Potential Contaminants of Concern	Potential Receptors	Risk Range (lowest – highest)	Key Potential Contaminant Linkages
CL-15 Stephenson Street Industrial Estate	Various industrial usage, peat.	Various possible including heavy metals, organics /inorganics and ground gas.	Human health, Secondary B aquifer, surface waters	Very low – Moderate	Risk of potential ground gas (explosion) to construction workers. Localised hydrocarbon impaction of soils.
CL-16 Infilled River Ebbw (included in CL-14 above)					
CL-17 Solutia Chemical Works	Chemical works, inert and industrial waste landfills	Organochlorines and aromatic based organic compounds including PCBs. Widespread elevated PCBs, asbestos and alkaline soils. Ground gas.	Human health, Secondary B aquifer, surface waters	Very low – High	Elevated ground gas (explosion) to construction workers during piling. Mercury hotspot and asbestos in shallow soils impacting on construction workers.
CL-18 River Usk Pier Location	Contaminated river sediments	Various including hydrocarbons, heavy metals and other inorganics.	Human health/ Secondary B aquifer, surface waters, River Usk	Very low – Moderate	Inhalation of ground gas or hydrocarbon vapours from superficial deposits during construction. Dermal contact with, and ingestion of contaminated perched groundwaters/ aquifer.
CL-20 Mir Steelworks and Associated Waste Disposal Site (included in CL-15 above)					
CL-22 Former Llanwern Research Laboratories	Made Ground comprising ash, slag and demolition rubble. Benzene pipeline	Various including heavy metals, hydrocarbons (including benzene)	Secondary B aquifer, human health	Very low – Moderate (High for benzene pipeline)	Inhalation of ground gas/vapour associated with benzene pipeline.

Site Name	Potential Contaminant Source	Potential Contaminants of Concern	Potential Receptors	Risk Range (lowest – highest)	Key Potential Contaminant Linkages
CL-26 Llanwern Steel Works - Including Lagoons Areas	Made Ground including lagoon slag and sludge with contaminated perched water. Ground gas including CO and H_2S.	Various including heavy metals, inorganics and, hydrocarbons. Ground gas including CO and H_2S.	Human health, Secondary B aquifer, surface waters	Very low - High	Dermal, ingestion and inhalation of potentially contaminated soils/dusts and ground gas to construction workers. Inhalation and explosive risk to construction workers from localised hazardous gases Uncontrolled contaminated run off entering surface waters.
CL-26 Llanwern Steel Works – Reedbed 1 and Metal Recovery Areas	Made Ground comprising slag and reedbed sediment with impacted perched water	Various including heavy metals, inorganics and, hydrocarbons	Human health, groundwater aquifers, surface waters	Very low – High	Dermal, ingestion and inhalation of potentially contaminated soils/dusts and ground gas to construction/maintenance workers and general public. Uncontrolled contaminated run off entering surface waters.

Site Name	Potential Contaminant Source	Potential Contaminants of Concern	Potential Receptors	Risk Range (lowest – highest)	Key Potential Contaminant Linkages
CL-27 Elver Pill Reen and Green Moor Landfill	Slag and industrial wastes	Various including heavy metals, hydrocarbons	Human health, surface waters	Very low - Moderate	Dermal, ingestion and inhalation of potentially contaminated soil/dusts/ground gas to construction workers. Elevated ground gas (explosion) to construction workers during piling. Uncontrolled contaminated run off entering surface waters.
CL-29 Spoil Heaps and Old Quarry, Llanwern Approach Road	Spoil materials	Various including hydrocarbons, heavy metals and other inorganics	Human health, superficial and bedrock aquifers	Very low - Low	None identified
CL-30 Green Moor Quarry Landfill	Quarry infill materials	Various possible	Human health, Principal aquifer	Very low – Low	None identified.
CL-32 Magor Depot (Wilcrick Depot)	Leaks/ spillages including underground storage tanks. Made Ground	Hydrocarbons, Volatile Organic Compounds (VOCs),Semi Volatile Organic Compounds (SVOCS)	Human health, Secondary A aquifer	Very low - Moderate	Inhalation of hydrocarbon vapours, soil dust, dermal contact with and ingestion of contaminated soils by construction workers. Leaching/migration of contaminants from Made Ground, buried tank or fuel spills to aquifer.

Site Name	Potential Contaminant Source	Potential Contaminants of Concern	Potential Receptors	Risk Range (lowest – highest)	Key Potential Contaminant Linkages
CL-33 B4245 Quarry	Infill materials	Various possible including heavy metals and hydrocarbons	Human health, superficial and bedrock aquifers	Very low– Moderate to low	Inhalation of ground gas or vapours from quarry in-fill materials by construction workers/maintenance workers. Leaching/migration of contaminants into aquifer.
CL-35 Magor Services	Leaks / spillages	Hydrocarbons	Human health, groundwaters and surface waters	Low - Moderate to low	Migration of hydrocarbon contamination via groundwaters and subsequent inhalation of vapours by human receptors, contamination of groundwaters and surface water.
CL-38 Knollbury Cesspits	Cess pits	Sewage	Human health	Very low	None identified
CL-39 The Elms Road Old Quarry and Lime Kiln	Made Ground	Various including heavy metals and hydrocarbons	Human health, groundwaters and surface waters	Low - Moderate	Dermal, ingestion and inhalation of potentially contaminated soils/dusts and vapours to construction workers.
CL-41 Severn Junction Tunnel Yard	Made Ground	Various including heavy metals	Human health, groundwaters and surface waters	Very low - Moderate to low	Leaching of Made Ground during construction works into surface waters. Possible soil-water linkage identified for TPH.

Note 1: No historical ground investigation data available.

4.7.16 Based upon the re-evaluation of the contamination risk levels provided by the 2016 Additional Ground Investigation, Tables 11.11 to 11.15 and 11.17 to 11.22

of the March 2016 ES have been updated where considered necessary. The revised tables are provided in Appendix S11.1.

4.7.17 The effects of the proposed new section of motorway on soils and geology specifically land contamination have been re-assessed following receipt of data obtained during the 2016 Additional Ground Investigation and these are summarised in Table R11.22 in Appendix S11.1. The re-evaluation of potential effects has not identified any increase in the significance of effects. Instead some potential effects are now considered likely to be less than previously set out in the March 2016 ES as risk levels from some of the potentially contaminated sites are lower based on the findings of the 2016 Additional Ground Investigation and refinement of the conceptual site models.

4.7.18 The revised assessment has enabled risks to be refined, enabling some previously identified potential impacts to be removed or down-graded. The new data have also confirmed or identified some additional impacts. However, the detailed remediation strategy to be developed prior to construction will address this in detail, as identified within the Outline Remediation Strategy Report (Appendix R11.2). With mitigation in place, effects are not considered significant.

4.8 Materials

4.8.1 There is no additional information relevant to this assessment.

4.9 Noise and Vibration

4.9.1 There is no new information relevant to this assessment. However, the noise modelling has been updated to reflect the modifications to the Scheme design and the errata identified in Part A of this ES Supplement. The findings of the updated noise modelling are discussed in Part D of this ES Supplement.

4.10 All Travellers

4.10.1 The following information has become available since publication of the March 2016 ES.

- An Active Travel Action Plan for Wales (Welsh Government, 2016).

Active Travel Action Plan

4.10.2 Welsh Government issued its Active Travel Action Plan in February 2016. Publication of this document occurred too late to be considered for the purposes of the assessment. However, the March 2016 ES was based on an earlier version, the consultation draft (Welsh Government, 2014). Since publication of the March 2016 ES, the 2016 Active Travel Action Plan has been reviewed and it is considered that the overall approach to assessment set out within the March 2016 ES would not be affected.

4.10.3 However, paragraph 14.2.1 of the March 2016 ES should be updated to read: *'….This is supported by 'An Active Travel Action Plan for Wales' (Welsh Government, 2016).'*

4.11 Community and Private Assets

4.11.1 The following information has become available since publication of the March 2016 ES.

- Additional survey of agricultural land.

4.11.2 The consequences of the additional information have been considered in this section.

4.11.3 An additional area of land, to the north of Bencroft Lane adjacent to Green Dairy, required as an area of borrow during construction, has been surveyed in detail to identify the pattern of Agricultural Land Classification (ALC) within it. Figure S15.1 identifies the location of auger boring samples across the area and the distribution of ALC grades. Appendix S15.1 contains the additional auger boring records across this area.

4.11.4 The land comprises a mixture of grade 3a and 3b agricultural land. The subgrade 3b soils include well drained, shallow and stony soils, mainly over limestone. These occur mainly on the western part of the area located on the sloping areas.

4.11.5 Moderately deep, medium textured soils with only slightly stony topsoils but overlaying either limestone or other stony material at about 30-40 cm occur over much of the eastern part field within this area. These are graded Subgrade 3a due to a depth and/or stoniness limitation.

4.11.6 There are also a number of other profiles that are heavier textured. Such soils suffer from a slight wetness limitation due to the combination of a long duration of field capacity and heavy topsoil textures and are accordingly graded 3a.

4.11.7 The areas and percentage of grades within this additional area of survey are as follows.

ES Supplement Table 4.4: Additional Area of Survey – Agricultural Land Classification

ALC Grade	Area (ha)	%
Grade 3a	6.3	50
Grade 3b	6.32	50
Total	12.62	100

4.11.8 In the March 2016 ES, it was assumed that this area of land could comprise entirely the 'best and most versatile' grades 2 or 3a land, based on published information available and the assumption of a worst case scenario in the assessment. The survey work has, however, identified that the area comprises only a proportion of grade 3a land with approximately half of the area comprising lower quality grade 3b land. Based on the survey results, there would be no significant differences in the assessment of potential land take effects on 'Community and Private Assets' as a result of the additional ALC survey work that has been carried out.

4.12 Road Drainage and the Water Environment

4.12.1 The following information has become available since publication of the March 2016 ES.

- Two further rounds of quarterly surface water monitoring have been undertaken, denoted Q5 and Q6.
- Time series data for water level variations in both shallow and deep water bodies have been recorded for a period between 31st May and 13th June 2016 on the ABP site. The data collected from borehole BHM4CAN045 suggest that the shallow perched groundwater within the Made Ground is not in hydraulic continuity with the deeper aquifer.
- Additional hydrogeological data and groundwater measurements, comprising elevations and chemical conditions, have been acquired during the 2016 Additional Ground Investigation undertaken by RPS (see Appendix R11.1).
- Updates to the Flood Consequences Assessment.

4.12.2 The additional data are presented in Appendix S16.1. Appraisal of this information indicates that the results of the additional rounds of monitoring are consistent with the earlier findings. Therefore, the conclusions of the Baseline Water Environment Report (Appendix 16.2 of the March 2016 ES) and of Chapter 16 of the March 2016 ES would not be affected.

4.12.3 A supplement to the Flood Consequences Assessment (Appendix 16.1 of the March 2016 ES) has been provided at Appendix S16.2 of this ES Supplement. This includes additional information in relation to tidal flood risk. Modifications to the Scheme design have also been taken into account. However, the design changes have not resulted in any changes to the impermeable surfaces for the proposed section of new motorway. Overall, it is concluded that the Scheme would be satisfactory with respect to flood risk.

4.13 Assessment of Cumulative Effects and Inter-relationships

4.13.1 The list of other developments has been updated to include the period up to 24 August 2016. An updated Appendix 17.2 is provided as part of this ES Supplement (Appendix R17.2).

4.13.2 Only one additional relevant application has been identified since publication of the March 2016 ES. This is Application 16/0230 to Newport City Council, as shown on Figure R17.1. The application is for the continued use of a site for motor racing on a limited number of days per year. At the time of writing, the application had not been determined. The land has been used for this purpose under a series of temporary consents and has therefore been considered as part of the baseline within the assessments undertaken to date. The effects of the Scheme on this land use have already been considered within the March 2016 ES (see Chapter 15 of the March 2016 ES).

4.14 Environmental Management

4.14.1 The Register of Environmental Commitments provided at Appendix 18.1 of the March 2016 ES has been updated and is provided in Appendix R18.1 of this ES

Supplement. The Register is in draft and will remain so up to and throughout the Public Local Inquiry during which it is anticipated that further commitments will be added and others amended and closed out.

5 Part D: Design Modifications

5.1 Changes Since Submission of the March 2016 ES

5.1.1 Since the publication of the draft Orders and the March 2016 ES, the following design changes have been incorporated as part of this ES Supplement. The key parameters of the Scheme remain unchanged from those reported in the March 2016 ES.

- Minor revisions to the NMU provision at Church Lane (to provide a 2 metre wide paved footpath) and Lighthouse Road (to provide hardened verges). In addition, at Dyffryn, the structural form of the Percoed NMU Bridge is proposed to be amended from a truss to virendeel beam form.
- Docks Way Junction: Revised horizontal and vertical alignment to lower the slip and link roads, remove the secondary roundabout and change the form of structure of the mainline viaduct (SBR-0885 Docks Way Junction Viaduct). This also reduced the length and height of the retaining wall along Docks Link Road (SRW-0895 Docks Link Retaining Wall). There would be no change in the title land in the CPO at this location but the design changes would result in a structure that would be supported on piers rather than embankment, facilitating potential future flexibility of land use.
- Docks Link Road: Realignment of Maes Glas Pill Culvert and bridge extension (SBR-0925A) and retaining wall (SRW-0910) added based on outcome of further survey and as-built information provided allowing further design to be undertaken.
- Glan Llyn Junction: Link to be amended to provide access from Glan Llyn Link Road to the Tata owned land to the east. In addition, a retaining wall would be provided to reduce the impact on an existing pylon (SWR-1520 Pylon SE001 Retaining Wall).
- Junction 23a to Junction 23 Trunk Road: Revised vertical alignment at the west tie-in to lower the trunk road, achieved by matching the headroom of the proposed extension to St Bride's Road Bridge to the headroom of the existing St Bride's Road Bridge.
- Magor Interchange (Junction 23) Roundabout: Revised vertical alignment to lower part of the roundabout, achieved by realigning Bencroft Lane, removing Bencroft Lane underpasses and providing an overbridge to the east over the M48 (SBR-2340 Windmill Hill Overbridge).
- Magor Interchange (Junction 23) Westbound Free-flow Link: Revised vertical alignment to lower the free-flow link and height of the associated retaining wall (SRW-2320 Magor Retaining Wall) by introducing a small retaining wall (SRW-2285 Rockfield Lane North Wall) between the link and the Junction 23a to Junction 23 trunk road.
- Magor Interchange (Water Treatment Area 12B): Further site investigation work has concluded that Vurlong Reen would not be sufficient for discharge of this Water Treatment Area (WTA). An alternative discharge point has been identified, which runs alongside Old Court Farm access drive and from where it would tie into existing drainage arrangements.

- Changes to the Environmental Management Plans. These amendments include the following.
  - Opposite Tatton Farm, screening has been increased for the listed building.
  - Additional screen planting to the north of Pye Corner.
  - At Rockfield Lane, the grass strip has been amended to include scrub and trees for screening.
  - Amendments to allow for species-rich grassland on south facing embankments.
- Tatton Farm: The whole of Tatton Farm is now included in the SSSI Mitigation Strategy.

5.1.2 The effects of the above modifications are considered within this section of the ES Supplement. In addition, a number of minor modifications are included on the General Arrangement Plans on Figure R2.4. Details are provided in Appendix S2.3. None of the minor modifications would affect the assessment of environmental effects.

Changes to Plans Supporting Chapter 2 of the March 2016 ES

5.1.3 Updated General Arrangement Plans for the proposed new section of motorway are provided at Figure R2.4, with updated Highway Drainage and Reen Mitigation Plans provided at Figure R2.5 and Environmental Management Plans provided at Figure R2.6. In addition, the following updated drawings are provided.

- Figure R2.7 – Proposed New Section of Motorway Cross Sections (Sheets 5, 12 and 13 have been updated).
- Figure R2.8 – Proposed New Section of Motorway Long Section.
- Figure R2.9 – Percoed NMU Bridge.
- Figure R2.12 – River Ebbw Underbridge.
- Figure R2.13 – River Usk Crossing Plan and Elevation.
- Figure R2.16 – Total Permanent and Temporary Land Take.

Changes to Chapter 2 of the March 2016 ES

5.1.4 The modifications to the design described above and in Appendix S2.3 provide an update to Chapter 2 of the March 2016 ES. Figure R2.4 provides updated details of the proposed new section of motorway.

5.1.5 A number of structures listed in Table 2.2 of the March 2016 ES are no longer proposed (where they are associated with the reconfigured Docks Way Junction and with the amended proposals at Bencroft Lane). These include structures SBR-0875, SBR-0880, SBR-2340A, SBR-2360B and SBR-2365A. A number of new structures would be required as set out below.

- SBR-0885: Docks Way Junction Viaduct: A proposed viaduct to connect the River Ebbw Underbridge and the western approach viaduct of the River Usk Crossing. The proposed gyratory system for the Docks Way Junction would sit below this viaduct, which would carry the new section of motorway. The structure would consist of pre-cast concrete beams with an *in-situ* concrete

deck slab, spanning between support walls and columns. The structure would be approximately 631.75 metres long with spans between 20 metres and 30 metres, a deck width of approximately 36.6 metres to 72.6 metres and a minimum headroom of 5.3 metres.

- SBR-2430: Windmill Hill Overbridge: Proposed overbridge carrying Bencroft Lane over the existing M48. The structure would consist of single span integral bridge formed from pre-stressed concrete beams supporting a reinforced concrete deck slab. The structure spans would be approximately 30 metres, carrying a single carriageway 4.5 metres wide, with 1 metre and 2 metre wide verges.

5.1.6 With respect to culverts and reen bridges, it is noted that the modifications to the design of the proposed new section of motorway would require some modifications to the proposed culverts (for example, changes in length). Details of the proposed structures are provided in Appendix S2.2. Two new structures are proposed.

- SBR-1485: Monks Ditch Tata Access Culvert: Structure proposed to carry the new access to Tata land.
- SMN-0905: Maes Glyn Culvert: Structure proposed to carry the realigned Maes-Glas Pill. The link road from the Docks Way Junction would pass over this structure.

5.1.7 The traffic model has been revised to take into account the design modifications to the Scheme. A supplement to the Traffic Forecasting Report has been produced and the updated traffic flows are provided in Appendix R2.1. This replaces Appendix 2.1 of the March 2016 ES and provides an update to Tables 2.9 and 2.10 of Chapter 2 of the March 2016 ES. The changes to traffic flows are very minor. The only design change which results in changes to traffic flows on the road network is the change to the Docks Way Junction.

5.2 NMU Provision at Church Lane and Lighthouse Road

5.2.1 The design modifications would not result in any changes to the assessment of land take, construction and operational effects for ant of the ES topic areas.

5.3 Docks Way Junction

5.3.1 As set out above, changes have been made to the vertical and horizontal alignment of the Docks Way Junction, together with proposed realignment of the Maes Glas Pill Culvert and bridge extension. The changes comprise removal of the smaller roundabout, changes to the slip roads and slight amendments to height. The proposed new section of motorway east of the junction would be constructed on a viaduct rather than the embankment originally proposed. In addition, updated traffic flows have been provided.

Air Quality

5.3.2 The revised traffic model has been reviewed against the data used in the air quality assessment presented in the March 2016 ES. Having regard to Annual Average Daily Traffic (AADT) traffic flows for light and heavy goods vehicles and

the change criteria outlined in DMRB (HA207/07) (Highways Agency *et al.,* 2007) the changes to traffic flows in the revised traffic modelling are not significant and would not change the conclusions of the assessment of air quality effects in the March 2016 ES.

Landscape Effects

5.3.1 The entire Docks Way Junction area falls within Local Landscape Character Area 3 – Newport Docks and Uskmouth. There would therefore be no changes to the impacts already described for the other Local Landscape Character Areas. The changes to the Docks Way Junction would alter the nature of some of the elements being introduced into this character area. Retaining walls and embankments supporting parts of the road would be substituted in many places with supporting piers. In that case, the junction arrangement would appear more open and less solid and grounded, to some degree appearing to sweep through and over the character area, rather than sever it, and appearing to unify the bridges over the Rivers Ebbw and Usk. It is considered that this would reduce the impact on the character area when compared to the original design. Conversely, some of the areas underneath the elevated sections of road may create difficult conditions for the establishment of mitigation planting, with no positive function within the character area. It is considered that this would be adverse in terms of the character area when compared to the original design.

5.3.2 Taking these changes together, it is considered that the magnitude of impact and significance of effect on this character area detailed in the March 2016 ES (paragraphs 9.8.18 to 9.8.25) would remain unaltered.

Visual Effects

5.3.3 The changes to the approach roads, slip roads and proposed new section of motorway in this area would affect the visual amenity of receptors within the surrounding docks area and users of the nearby River Ebbw and Wales Coast Path (representative viewpoints 23a, 24 and 93, PRoW receptor 47, transport route receptor 180 and non-residential receptor 57b). The March 2016 ES identified that these receptors would have views of the proposed new section of motorway as it spans and runs between the Rivers Ebbw and Usk (paragraphs 9.8.112, 9.8.115, 9.8.117, 9.8.118, 9.8.329, 9.8.364, 9.8.367, 9.8.458, 9.8.461). These views would encompass elements of the Docks Way Junction.

5.3.4 It is considered that the changes to the junction would alter the nature of the impacts (i.e. alter the detail of the change to views available). The omission of fill and the associated embankments and retaining structures under the proposed new section of motorway and replacement with supporting piers would remove opportunities for planting and grass seeding, which would help to soften these elements and break up the mass of built elements. This would therefore be considered to be an adverse effect. Conversely, the lowering of some elements (specifically the southern end of Docks Way and its approaches to the roundabout at the junction) would reduce the visual impact on the area and this would be considered to be beneficial compared to the original design. Additionally, as the proposed new section of motorway would remain on viaduct between the two river bridges (if supported on piers rather than embankment) this would help this element to read as one flowing homogenous structure, which would be considered beneficial. Considered together, it is considered that the magnitude of impacts and significance of effects on the receptors listed above as

detailed in the March 2016 ES would remain the same. Please see Figure R9.11 for updated photomontages.

Geology and Soils

5.3.5 Although there have been some changes to the design, the conclusions set out in Sections 11.10, 11.11, 11.12 and 11.15 of the March 2016 ES remain valid. Furthermore, the changes do not affect any additional known potential sources of contamination. However, the 2016 Additional Ground Investigation data have enabled the extent of contamination requiring remediation to be refined as a consequence of reducing uncertainty in the existence and level of contamination across the Scheme. This is set out in Section 4 of this ES Supplement, with supporting detailed in Appendix R11.1.

Noise and Vibration

5.3.6 The traffic model has been revised to take into account the design modifications discussed above. The only design change which results in changes to traffic flows on the road network is the change to the Docks Way Junction. The revised traffic model has been reviewed against the data used in the noise assessment presented in the March 2016 ES. Having regard to traffic flows for light and heavy goods vehicles and the change criteria outlined in DMRB (HA207/07), the changes to traffic flows in the revised traffic model are not significant and would not change the conclusions of the assessment of noise and vibration effects provided in the March 2016 ES. Nevertheless, as set out in Part A of this ES Supplement, updated modelling has been provided in Appendix R13.4, taking into account minor errors in the model and the the design modifications to the Scheme.

Road Drainage and the Water Environment

5.3.7 There would be no significant differences in the assessment of potential construction or operational effects as a result of the changes to the design of the Docks Way Junction.

5.3.8 The updated traffic flow data from the revised Core Scenario forecasts based on the Scheme changes have been reviewed. There would be no significant differences in the assessment or road drainage effects. Therefore, the conclusions of the March 2016 ES would remain unaltered.

5.3.9 As set out in Section 4 of this ES Supplement, a supplement to the Flood Consequences Assessment (FCA) is provided at Appendix S16.2. This takes into account both additional information in relation to tidal flood risk and the proposed modifications to the Scheme design. The design changes have not resulted in any changes to the impermeable surfaces for the proposed section of new motorway. Overall, it is concluded that the Scheme would be satisfactory with respect to flood risk.

Other Topic Areas

5.3.10 The design modifications at Docks Way would not result in any changes to the assessment of land take, construction and operational effects for the following topics.

- Cultural Heritage.

- Ecology and Nature Conservation.
- Materials.
- All Travellers.
- Community and Private Assets.

5.4 Glan Llyn Junction

5.4.1 The design modifications at the Glan Llyn Junction would not result in any changes to the assessment of land take, construction and operational effects for any of the ES topic areas.

5.5 Magor Interchange

5.5.1 At the Magor Interchange there is a new proposed alignment for Bencroft Lane extending eastwards along the north of the proposed new section of motorway with a corresponding adjustment to the alignment of the temporary haul road to Ifton Quarry. A small area of permanent and temporary land take to the west of the roundabout structure would no longer be required and there is a strip to the north of the roundabout and extending eastwards where additional permanent and temporary land take would be required to accommodate the realigned Bencroft Lane and haul road. Additional land would also be required to the east of the roundabout for the new Windmill Hill Overbridge where it would cross the existing A48M north of Llanfihangel near Rogiet.

Air Quality

5.5.2 Although the changes to the Scheme would require some changes to the Scheme boundary near Magor, the conclusions of Section 7.6 (Assessment of Potential Land Take Effects) of the March 2016 ES would not be affected.

5.5.3 The Scheme changes would not result in any changes to the conclusions set out in Sections 7.7 or 7.8 of the March 2016 ES. Therefore, the summary of air quality effects presented in Table 7.26 of the March 2016 ES remains valid.

Cultural Heritage

5.5.4 The design changes with regard to the Magor Interchange would affect the assessment presented in Chapter 8 of the March 2016 ES for a number of heritage assets.

5.5.5 The land required for the Windmill Hill Overbridge south of the existing M48 motorway connecting through to the B4245 Caldicot Road is wholly within the Rogiet Llanfihangel Conservation Area (CA001), as is the land required for the woodland planting that would screen views of this structure. This represents land take within the Conservation Area additional to that previously assessed.

5.5.6 This additional land take within the Rogiet Llanfihangel Conservation Area could contain archaeological remains associated with the former larger historic settlement here and the loss of such remains (if present) would also affect the significance of the Conservation Area. No archaeological evaluation has been undertaken with regard to this additional land take within the Conservation Area,

which is also wholly within an Area of Special Archaeological Sensitivity established by Monmouthshire County Council.

5.5.7 The design changes would also affect the assessment presented in Chapter 8 of the March 2016 ES with regard to the setting of the Rogiet Llanfihangel Conservation Area. The overall lowering of the Magor Interchange by as much as 3.8 metres means that the visible impact on the historic core of the Conservation Area would be reduced. This can be seen in the comparison of the images from Viewpoints 84 and (Figures 9.11k(i-vi) of the March 2016 ES) and the same images for the redesigned interchange (Figures R9.11k(i-vi)).

5.5.8 Overall, the magnitude of impact on the Conservation Area as a result of the design changes to the Magor Interchange would remain as moderate, as would the consequent significance of effect.

5.5.9 The design changes with regard to the Magor Interchange would also affect the assessment presented in Chapter 8 of the March 2016 ES with regard to changes within the settings of listed buildings. The Windmill Hill Overbridge would be less than 100 metres from the Grade II listed Green Farmhouse (LB015) and the adjacent barn (LB016) and cowhouse range (LB017) whilst the embankment carrying this lane to the connection with the B4245 Caldicot Road would be closer than this. In the March 2016 ES, the magnitude of impact of the Scheme on each of these listed buildings was assessed as minor, resulting in each case in an effect of slight significance (paragraph 8.8.166 of the March 2016 ES).

5.5.10 The revised design of this junction would result in a greater level of visual impact due to the proximity of the Windmill Hill Overbridge and embankment, although there would be reduced visible impact as a result of the lowering in height of other major elements of this junction and the increase in traffic noise would be less than the level previously assessed. The consequent magnitude of impact on this group of three Grade II listed buildings would be moderate, resulting in each case in an effect of moderate adverse significance.

5.5.11 The design changes with regard to the Magor Interchange would also affect the assessment presented in Chapter 8 of the March 2016 ES with regard to the Grade II* listed Church of St Michael and All Angels at Llanfihangel (LB002) and the adjacent Old Court Farm (LB012), stables (LB013) and farm range (LB014), all listed at Grade II. However, the addition of the Windmill Hill Overbridge would not increase the visual impact here as this structure would be seen behind Green Farmhouse and the associated farm buildings. There would be a reduction in visible impact as a result of the lowering in height of other major elements of this junction and any increase in traffic noise would be less than the level previously assessed. However, this would not alter the assessment of effects with regard to these listed buildings.

5.5.12 The design changes with regard to the Magor Interchange would also affect the assessment presented in Chapter 8 of the March 2016 ES with regard to the Grade II listed Old Windmill at Rogiet (LB019). The Windmill Hill Overbridge would be approximately 350 metres from this structure. However, the magnitude of impact as a result of change within the setting of this listed building would remain negligible and the significance of effect would remain neutral.

Landscape Effects

5.5.13 New native hedgerows, linear tree belts and small woodland blocks are proposed to mitigate the adverse impacts of the diverted Bencroft Lane and proposed overbridge. Native hedgerows are proposed alongside the new section of Bencroft Lane to reflect the character of existing minor roads in the area. Linear tree belts and small woodland blocks are proposed to screen and soften the abutments and embankments of the bridge. Updated Environmental Masterplans are provided at Figure R2.6.

Construction

5.5.14 The proposed Magor Interchange, including the Windmill Hill Overbridge, falls entirely within the Local Landscape Character Area 5, Chepstow Woods Southwest. There would therefore be no changes to the impacts described in the March 2016 ES for the other Local Landscape Character Areas. The impacts of the proposed construction phase elements, including those associated with the Windmill Hill Overbridge, and the proposed reduction in finished levels to the Magor Interchange, would remain as described in Section 9.7 of the March 2016 ES (and specifically paragraphs 9.7.29 – 9.7.35). There would, however, be a slight increase in the extent of the area affected, which would include a small part of the Llanfihangel near Rogiet Conservation Area.

5.5.15 It is considered that, whilst these changes would alter and add to construction activity, they would not change the magnitude of impact from that already assessed, which would remain as a major adverse magnitude of change. The significance of effect on this landscape character area would remain as large adverse as described in paragraph 9.7.35 of the March 2016 ES.

Operation

5.5.16 The proposed Magor Interchange, including the proposed Windmill Hill Overbridge, would fall entirely within the Local Landscape Character Area 5, Chepstow Woods Southwest. There would therefore be no changes to the impacts described for the other Local Landscape Character Areas. The proposed operational phase elements, including those associated with the Windmill Hill Overbridge, and the proposed reduction in finished levels to the Magor Interchange, would remain as described in Section 9.8 of the March 2016 ES (specifically paragraphs 9.8.34 – 9.8.41). There would, however, be a slight increase in the extent of the area affected, which would include a small part of the Llanfihangel near Rogiet Conservation Area.

5.5.17 In winter, year 1, it is considered that, whilst these changes would alter and add to operational phase landscape impacts slightly, they would not change the magnitude of impact from that assessed. This would remain as a moderate adverse magnitude of change. The significance of effect would remain as moderate adverse as described in paragraph 9.8.40 of the March 2016 ES.

5.5.18 In summer, year 15, it is considered that, whilst these changes would alter and add to operational phase landscape impacts slightly, they would not change the magnitude of impact from that assessed. The magnitude of change would remain as minor adverse. The significance of effect would remain as slight adverse as described in paragraph 9.8.41 of the March 2016 ES.

Visual Effects

Construction

5.5.19 The construction of the Windmill Hill Overbridge would be an additional construction phase element that would affect the visual amenity of receptors on the northern edge of Llanfihangel near Rogiet and to the north of the existing M48 who have views towards this area (residential receptor groups 145c and 147 and public right of way (PRoW) receptor group 149b). The March 2016 ES identified that these receptors would have direct views towards a variety of construction elements and activity (paragraphs 9.7.206 and 9.7.269). It is considered that whilst this new element would add to this construction activity, it would not change the magnitude of impact from that already assessed, which would remain as major adverse. The significance of effect on visual amenity would therefore remain as a temporary large adverse significance.

Operation

5.5.20 The Windmill Hill Overbridge would be an additional highway element that would affect the visual amenity of receptors on the northern edge of Llanfihangel near Rogiet and to the north of the existing M4 and M48 motorways in this vicinity (residential receptor groups 145c and 147 and PRoW receptor group 149b). The March 2016 ES identified that these receptors would have views towards the proposed new section of motorway and various components of the Magor Interchange area during the operational phase (paragraphs 9.8.304, 9.8.308, 9.8.399 and 9.8.403). It is considered that, whilst this new element would represent an additional impact on visual amenity it would not change the magnitude of impact from that already assessed, which would remain as moderate adverse in year 1 and minor adverse in year 15. The significance of effect would therefore remain as a moderate adverse significance in year 1 and slight adverse in year 15.

5.5.21 The reduction in height of various elevated highway elements associated with the Magor Interchange such as bridges and flyovers would reduce the visual impact of these elements within the views available to receptors on the north eastern edge of Magor, the northern edge of Llanfihangel near Rogiet and areas to the north of the existing M4 and M48 motorways in this vicinity. The affected receptors include the following.

- Representative viewpoints 67, 80, 81, 84 and 144b.
- Residential receptor groups 134, 142, 143, 144, 145b, 145c and 147.
- Non-residential receptors 145a and 146.
- PRoW receptor groups 95, 135, 147 and 149b.
- Road user receptors 175 and 177.

5.5.22 The March 2016 ES identified that these receptors would have views towards the proposed new section of motorway and various components of the Magor Interchange area during the operational phase, along with associated traffic and infrastructure (Section 9.8). It is considered that whilst the reduction in height of these new elements would change the degree to which they influence visual amenity in the area, and would lessen the time that it takes for mitigation planting to begin to screen them, the various elements, traffic and infrastructure would

remain visible to a similar degree. It is considered therefore that there would be no change to the magnitude of impact or the significance of effect on visual amenity from that already assessed in the March 2016 ES.

5.5.23 Photomontages from viewpoints 84 and 144b have been updated (Figure R9.11J (i to vi) and R9.11K (i to vi)) to illustrate the impacts on these views with the design changes to the elevated highway elements at Year 1 and Year 15 following completion of the Scheme. It can be seen that the reduction in height of the vertical elements results in minimal change in the degree of influence on visual amenity in Year 1 from both viewpoints. In Year 15, these elements remain visible to a slightly lesser but similar degree from those described in the ES, demonstrating that the magnitude of impact and significance of effect on visual amenity are as assessed in the March 2016 ES.

Ecology and Nature Conservation

5.5.24 The additional land take would be predominantly improved grassland with some poor semi-improved grassland and a small area of arable land. There would be loss of a short additional section of species-poor hedge.

5.5.25 A possible dormouse nest was located in 2015 in a strip of woodland to the east of Minnett's Lane to the north of the location of the proposed Windmill Hill Overbridge. The modifications to the design would have no additional effects on this strip of woodland.

5.5.26 There would be no significant differences in the assessment of the ecological impacts and effects due to land take, construction or operation as a result of the changes to the alignment of Bencroft Lane and associated revisions to the proposed Magor Interchange and haul road to Ifton Quarry.

Geology and Soils

5.5.27 Although there have been some changes to the design, the conclusions set out in Sections 11.10, 11.11, 11.12 and 11.15 of the March 2016 ES remain valid. Furthermore the changes do not affect any additional known potential sources of contamination. However, the additional ground investigation data have enabled the extent of contamination requiring remediation to be refined as a consequence of reducing uncertainty in the existence and level of contamination across the Scheme. This is set out in Section 4 of this ES Supplement, supported by Appendix R11.1.

Noise and Vibration

Construction Phase

5.5.28 The modifications to the design would not alter the distance-bands at which impacts are predicted to occur. The alignment of the impact bands would change to follow the changes to the outer edge of the limit of temporary or permanent land take. However, as these changes are minor, these changes would not affect the impact magnitude or significance of effect reported in the March 2016 ES.

Operational Phase

5.5.29 Changes to the horizontal and vertical alignment around the Magor Interchange would result in slight changes to the expected noise levels across the

surrounding area. The changes have been modelled and results reported in Appendix R13.4. Consequently, the noise contours and predictions of individual noise sensitive receptors (NSR) noise levels have changed slightly in the area, with a small number of NSRs moving between noise level bands (where they were already close to a band boundary). No change to the overall range of significant effects is predicted.

Community and Private Assets

5.5.30 The new alignment would affect land within the large livestock based enterprise at Green Farm to the north of the M48. Within this holding, this would increase the permanent land loss within this holding by approximately 0.6 hectares, but would reduce the temporary land take during construction by approximately 0.3 hectares. The proposal here would change the access from the buildings at Green Dairy south to the B4245. The farm access route would then run eastwards from the farm track along the new alignment to an exit onto the B4245 at Llanfihangel, close to the other second set of farm buildings that form part of this holding at Green Farm, situated to the south of the B4245.

5.5.31 In addition, the new alignment permanently affects an area of approximately 0.4 hectares of grassland located between the M48 and the B4245 to the south. This land is in the ownership of an individual not previously directly affected by the Scheme. However, it is understood that this land is being farmed by agreement with the owner as part of the Green Farm holding, previously assessed as part of the March 2016 ES.

5.5.32 There would be no significant differences in the assessment of land take, construction or operational effects on 'Community and Private Assets' as a result of the changes to the alignment of Bencroft Lane.

Road Drainage and the Water Environment

5.5.33 There would be no significant differences in the assessment of potential construction effects as a result of the changes to the alignment of Bencroft Lane and associated revisions to the proposed Magor Interchange and haul road to Ifton Quarry.

5.5.34 The existing Bencroft Lane discharges untreated drainage into a minor watercourse, which flows in a southerly direction on the west side of the access road to Court Farm. The land to the south of the M48, on which it is proposed to build the embankment up to the realigned Bencroft Lane, has no current formal drainage. Rainfall on this parcel of land either soaks away or during storm events flows onto the B4245 via field accesses and is picked up by the existing highway drainage comprising gullies.

5.5.35 The removal of the Bencroft Lane underpass and the changes to the vertical alignment would allow drainage runs from the west to extend to the gyratory rather than having to be separately routed to WTA 12a. Previously Bencroft Lane underpass was a constraint to the routing of pipework to WTA12a. This results in a small reduction in overall pipe lengths and manhole numbers, but is likely to increase some pipe sizes. The system is able to take flows to the south in a single carrier drain to tie in with the existing proposals to WTA 12a.

5.5.36 Drainage at the off slip to Caldicot Road requires reconfiguration due to level changes in this area, however this can be accommodated and overall lengths of

drainage would be unchanged. Level amendments in the area of St Brides Road could be accommodated with minimal impact on the overall lengths and depths of drainage.

5.5.37 It is considered that the existing M48 drainage would be able to accommodate the additional runoff from the realigned Bencroft Lane in-lieu of the area of Magor Junction previously proposed to drain to WTA12.

5.5.38 It is considered that ground to the south of the existing M4 is capable of accepting the soakaway discharge from the Windmill Hill Overbridge and associated earthworks owing to the presence of River Terrace Deposits overlying permeable strata of the Mercia Mudstone Group Marginal Facies.

5.5.39 The paved area of the realigned Bencroft Lane draining to the infiltration trench would be 910 m^2. This includes the area of Bencroft Lane realigned over the proposed new section of motorway, which is assumed to drain to the south. There would also be an area of 2,940 m^2 of verge and embankment slope contributing to the infiltration trenches. The drainage from these area would be split equally to the infiltration trenches either side of the embankment on the south side of the M48.

5.5.40 Bencroft Lane is a very minor access road with minor vehicle usage. It is not therefore proposed to provide treatment for this runoff, particularly as the existing lane discharges untreated drainage. Consequently, no significant new risk or increased risk to the water environment would be introduced and therefore there would be no significant differences in the assessment of road drainage effects as a result of the modifications to the design.

5.5.41 The supplement to the Flood Consequences Assessment is provided at Appendix S16.2.

Other Topic Areas

5.5.42 The design modifications at the Magor Interchange would not result in any changes to the assessment of land take, construction and operational effects for the following topics.

- Air Quality.
- Materials.
- All Travellers.

5.6 Changes to Environmental Management Plans and SSSI Mitigation Strategy

Cultural Heritage

5.6.1 Chapter 8 of the March 2016 ES included an assessment of the likely impacts and effects on the historic environment resulting from the establishment of three ecological mitigation areas (paragraph 8.6.6) and Figure 8.7 of the March 2016 ES indicated the location and extent of each of these areas.

5.6.2 The revised proposals for the ecological mitigation area adjacent to the Grade II listed Tatton Farm (LB009) take account of the presence here of earthworks that appear to represent the remains of up to five enclosures, possibly associated with

settlement in the vicinity of the historic farm (ARCH031). These remains would not be affected by the establishment of the revised ecological mitigation area. Overall it is still considered that the ecological mitigation area here provides an additional level of protection against further development within the immediate setting of the Grade II listed Tatton Farm (cf. paragraph 8.8.147 of the March 2016 ES).

5.6.3 The proposed additional planting immediately to the north of the new section of motorway at Tatton Farm would provide visual screening and would therefore reduce the impact on the setting of the listed building, as set out in paragraph 8.8.149 of the March 2016 ES. Figures R9.11 p(ii) and (iii) illustrate how the new section of motorway would appear from land adjacent to the farmhouse. This would result in a moderate magnitude of impact on this Grade II listed building (medium value). The consequent significance of effect would be moderate adverse.

5.6.4 No changes to the assessment presented in Chapter 8 of the March 2016 ES are required with regard to the amendments to the proposed ecological mitigation areas at Maerdy Farm or Caldicot Moor.

Ecology and Nature Conservation

5.6.5 Additional land at Tatton Farm has been included in the draft Orders for the purpose of SSSI mitigation. This land is already owned by Welsh Government and it has been included in order to minimise the amount of privately owned land needed for essential SSSI mitigation.

Community and Private Assets

5.6.6 The remaining southern part of the Welsh Government landholding at Tatton Farm is now included in the area of SSSI mitigation land. This western part of this additional area of Grade 4 land includes land that is currently let on a tenancy agreement to a large holding that comprises approximately 400 ha of land based at Pontypridd. The eastern area of the additional area is unoccupied. Whilst the land would remain as agricultural land and may still be available for use by the existing tenant, the management requirements within the area would be based on ecological objectives.

5.6.7 There would be no significant differences in the assessment of the construction, or operational effects as a result of the changes in the area of SSSI mitigation land at Tatton Farm.

Other Topic Areas

5.6.8 The modifications to the Environmental Masterplans would not result in any changes to the assessment of land take, construction and operational effects for the following topics.

- Air Quality.
- Landscape and Visual.
- Geology and Soils.
- Materials.
- Noise.

- All Travellers.
- Road Drainage and the Water Environment.

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