

Adran yr Economi a'r Seilwaith
Department for Economy and Infrastructure



Llywodraeth Cymru
Welsh Government

The M4 Motorway (Junction 23 (East of Magor) to West of Junction 29 (Castleton) and Connecting Roads) and The M48 Motorway (Junction 23 (East of Magor) Connecting Road) Scheme 201-

The M4 Motorway (Junction 23 (East of Magor) to West of Junction 29 (Castleton) and Connecting Roads) and The M48 Motorway (Junction 23 (East of Magor) Connecting Road) (Amendment) Scheme 201-

The London to Fishguard Trunk Road (East of Magor to Castleton) Order 201-

The M4 Motorway (West of Magor to East of Castleton) and the A48(M) Motorway (West of Castleton to St Mellons)(Variation of Various Schemes) Scheme 201-

The M4 Motorway (Junction 23 (East of Magor) to West of Junction 29 (Castleton) and Connecting Roads) and the M48 Motorway (Junction 23 (East of Magor) Connecting Road) and The London to Fishguard Trunk Road (east of Magor to Castleton) (Side Roads) Order 201-

The Welsh Ministers (The M4 Motorway (Junction 23 (East of Magor) to West of Junction 29 (Castleton) and Connecting Roads) and the M48 Motorway (Junction 23 (East of Magor) Connecting Road) and the London to Fishguard Trunk Road (East of Magor to Castleton)) Compulsory Purchase Order 201-

The M4 Motorway (Junction 23 (East Of Magor) to West of Junction 29 (Castleton) and Connecting Roads) and The M48 Motorway (Junction 23 (East Of Magor) Connecting Road) (Supplementary) Scheme 201-

The Welsh Ministers (The M4 Motorway (Junction 23 (East Of Magor) to West of Junction 29 (Castleton) and Connecting Roads) and The M48 Motorway (Junction 23 (East Of Magor) Connecting Road) and The London to Fishguard Trunk Road (East of Magor to Castleton)) Supplementary Compulsory Purchase Order 201-

Proof of Evidence

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Welsh Government, Environment - General

Document Number: WG 1.7.1

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Appendices

- A Environmental Overview Figures (Legend & 8 pages)
- B List of Meetings on Environmental Matters

1. Author

- 1.1 My name is Peter Ireland and I am a Senior Director in the Planning and Development Division of RPS Group plc (hereafter referred to as 'RPS'). I hold a MA in Geography and a Documenttorate of Philosophy, both from Oxford University.
- 1.2 I have been working in the general area of environmental planning, and more specifically environmental impact assessment (EIA) since 1990. Prior to joining RPS in 2003 I have held positions with Atkins; Enviros, as Head of EIA; and Hyder Consulting plc as Director of Environment. Between 1994 and 1999 I also lectured on EIA at Anglia Polytechnic University.
- 1.3 I have directed or project managed a large number of Environmental Statements covering a wide range of development types, including approximately 30 highway or transport related EIAs for Welsh Government, the Highways Agency (now Highways England), and various English local highway authorities, during which time I have provided expert evidence on a variety of assessment topics.
- 1.4 My role within RPS is to direct EIAs undertaken by my colleagues and to manage the EIA of more complex projects. I am also responsible for maintaining the quality of environmental statements and ensuring RPS's continuing commitment to the Institute of Environmental Management and Assessment's (IEMA) Quality Mark throughout RPS.
- 1.5 IEMA is, I understand, the largest professional environmental body in the world. Registrants to IEMA's Quality Mark which was launched in April 2011 are committed to delivering high quality assessments and reports and to actively improve EIA practice. IEMA monitors RPS's performance by an annual review via of audits Environmental Statements produced, interviewing staff, and RPS's provision of articles, presentations and case studies on EIA practice and recent projects.

- 1.6 Immediately prior to commencing work on M4 Corridor around Newport (M4CaN) I was the overall environmental co-ordinator and environmental statement co-ordinator for the Welsh Government's project to improve Section 2 of the A465 Heads of the Valleys Road between Gilwern and Brynmawr (A465 Hov(2)).
- 1.7 That scheme went through a Public Local Inquiry under the Highways Act 1980 (as amended) in March and April 2014. I gave general evidence on the environment.
- 1.8 A465 HoV(2) has similarities with M4CaN in that it required major construction works within a highly sensitive environment comprising the Brecon Beacons National Park adjacent to the Blaenavon World Heritage Site, two Special Areas of Conservation (SAC), a National Nature Reserve, three Sites of Special Scientific Interest (SSSI) and four Scheduled Ancient Monuments within a tightly constricted and steep sided, and therefore challenging, landscape.
- 1.9 The A465 HoV(2) is now under construction.

Role on the Scheme

- 1.10 The Early Contractor Involvement (ECI) Construction Joint Venture of Costain, Vinci Grand Projet and Taylor Woodrow (the Construction JV) together with the design team (a joint venture of Atkins and Arup supported by RPS) (the Costain Vinci Joint Venture) commenced work on the current stage of the M4 Corridor around Newport (hereafter referred to as the 'published scheme' or 'Scheme') in March 2015. My role throughout has been, and continues to be, the environmental co-ordinator for the Scheme.
- 1.11 My role has been to:
 - a) Oversee the preparation and production of key environmental documents including the March 2016 Environmental Statement (ES) (Document 2.3.2), the September 2016 Environmental

Statement Supplement (Document 2.4.4), the December 2016 Environmental Statement Supplement (Document 2.4.14) and the Statement to Inform the Appropriate Assessment (SIAA) (Document 2.3.4);

- b) Review the Environmental Statement and author and/or edit some of the non-assessment topic chapters;
 - c) Ensure compliance with environmental legislation and guidance;
 - d) Liaise with Welsh Government, the Construction JV and other members of the design team and provide the interface between the highway engineering design and constructability, and environmental design and assessment;
 - e) Co-ordinate meetings, consultation and liaison with relevant stakeholders on environmental aspects of the published scheme.
- 1.12 Should the Scheme proceed to construction, my role would be to co-ordinate the environmental design, continue to ensure compliance with environmental legislation and guidance, ensure ongoing liaison continues, and manage the on-site environmental mitigation and monitoring works.
- 1.13 I was not involved in the development of the route selection or initial M4CaN scheme design before March 2015.
- 1.14 I was however involved in preparing the successful tender submitted by the Costain Vinci Joint Venture.
- 1.15 The evidence which I have prepared and provide in this Proof of Evidence is to the best of my knowledge true. In preparing this Proof of Evidence I have referred to and adopt the work of other members of the environmental team, however, the opinions I express are my own.

2. Scope of Proof of Evidence

- 2.1 In this Proof of Evidence, I will begin by explaining the procedures and outline the key technical elements undertaken in:
- a) The EIA process and the published scheme ES
 - b) The ES Supplements
 - c) The ‘Assessment of the Implications on European Sites (AIES) process and the Statement to Inform the Appropriate Assessment (SIAA).
- 2.2 Second, I will provide an overview of the key environmental features and characteristics of the corridor for the new section of motorway to the south of Newport.
- 2.3 Third, I will explain how it is intended to manage effectively environmental matters and issues that may arise during construction, should the Scheme proceed to that stage. I will also briefly describe post-construction environmental management.
- 2.4 Fourth, I will explain what is meant by essential mitigation. Following on from that I then describe the overall mitigation strategy for the proposed new section of motorway and explain the need for additional land for essential mitigation belonging to those who have objected to their land being included in the draft Orders.
- 2.5 Fifth, I will explain in general terms (based on information in the published ES, (Document 2.3.2, 2.4.4, 2.4.14) how the enjoyment and amenity of people’s homes would be affected by the construction and operation of the new section of motorway and, with the new road in place should it proceed, how the enjoyment and amenity of people’s homes close to the existing M4 would be affected. In this section I also look in more detail at the properties of those land and house owners that have objected to the compulsory purchase of their land and have also raised the issue of loss of enjoyment of their property.

2.6 My evidence is therefore presented in the following structure:

1. Author
2. Scope of Proof of Evidence
3. Environmental Impact Assessment
4. March 2016 Environmental Statement
5. September 2016 Environmental Statement Supplement
6. December 2016 Environmental Statement Supplement
7. AIES and SIAA
8. Environmental Overview
9. Environmental management during and after construction
10. Essential Mitigation
11. Enjoyment of property
12. Summary and Conclusion

2.7 It is not my intention to reproduce large sections of text from the ES, but simply to cross refer to, or highlight key procedural and technical matters that are pertinent to the assessment of the published scheme. Consequently, I will refer in this Proof of Evidence to supporting material contained within the ES and the ES Supplements where relevant.

Links with Other Proofs

2.8 Details of environmental surveys and assessments undertaken and reported upon in the ES and the ES Supplement are covered in the proofs of evidence of other expert witnesses. These are:

- a) Terrestrial Ecology and Habitats Regulations – Proof of Evidence of Mr Keith Jones (WG 1.18.1);
 - b) Ornithology – Proof of Evidence of Mr Simon Zisman (WG 1.21.1)
 - c) Bats – Proof of Evidence of Mr Richard Green (WG 1.20.1)
 - d) Dormice and Water vole – Proof of Evidence of Mr Jon Davies (WG 1.19.1)
 - e) Noise and Vibration – Proof of Evidence of Mr Phil Evans (WG 1.14.1);
 - f) Air Quality – Proof of Evidence of Mr Michael Bull (WG 1.12.1)
 - g) Cultural Heritage – Proof of Evidence of Mr Mick Rawlings (WG 1.9.1);
 - h) Landscape and Visual Impact – Proof of Evidence of Mr Nick Rowson (WG 1.8.1)
 - i) Agriculture and NMU – Proof of Evidence of Ms Julia Tindale (WG 1.10.1)
 - j) Water Quality – Proof of Evidence of MR Richard Graham (WG 1.15.1)
 - k) Contamination – Proof of Evidence of Mr Andy Clifton (WG 1.11.1)
- 2.9 In addition, I cross refer to the Engineering Design Proof of Evidence of Mr Ben Sibert (WG 1.5.1), the Construction Proof of Evidence of Mr Barry Woodman (WG 1.6.1) and that of Mr Mike Vaughan (WG 1.17.1) and Mr Paul Canning (WG 1.16.1) on flooding matters. For the detail of the engineering design and construction of the published scheme reference should be made to those proofs.

Terminology and Guidance

- 2.10 Throughout my evidence, I will refer extensively to the guidance provided in the Design Manual for Roads and Bridges (DMRB) Volume 11 '*Environmental Assessment*' (Document 6.1.8) and Interim Advice Notes (IANs). The DMRB comprises 16 volumes that cover all aspects of highway design – engineering, environmental and economic. Volumes 10 (Document 6.1.8) and 11 are concerned with environmental design and environmental assessment respectively. The DMRB is the official guidance published by Government for the construction and/or improvement of roads in the UK. All of the volumes are organised in the same way, with each being divided into Sections and each Section being sub-divided into Parts, each covering a specific topic.
- 2.11 For ease of referencing I will reference Parts of the DMRB in this Proof of Evidence by way of the following example: DMRB 11.1.1 refers to DMRB Volume 11, Section 1, Part 1.
- 2.12 In addition to the DMRB reference some Parts of the DMRB also have a 'HA' or 'HD' reference. Where appropriate these are included also.
- 2.13 The DMRB was first published in 1993 and has been, and continues to be, updated on a Part by Part basis since that date. The updating process, which is managed by Highways England, is via the initial publication of an Interim Advice Note (IAN) which has equal status to the DMRB. Following a period of usage, the IAN is normally adopted as an updated Part of the DMRB. Thus, at any point in time, the guidance that should be followed (DMRB or IAN) is whichever is the most recent. Some Parts of the DMRB have been updated more than once since 1993, whilst others have not been updated either by the publication of an IAN or by the reissue of the DMRB. To complicate matters, some IANs are only used in Wales (suffixed by a 'W') whilst others have not been adopted in Wales.

- 2.14 Furthermore, some environmental disciplines have their own detailed guidance which is more up to date than that provided by the DMRB Volume 11. For example, the Landscape Institute and Institute of Environmental Management and Assessment jointly published the third edition of their '*Guidelines for Landscape and Visual Impact Assessment*' in 2013 (Document 10.1.3). The most recent corresponding Interim Advice Note is IAN 135/10 (Document 10.1.3) published in November 2010, whereas the DMRB Volume 11 guidance (DMRB 11.3.5) dates from 1993.
- 2.15 Consequently, whilst Chapter 5 of the ES for the published scheme provides a framework for the EIA process, each environmental assessment topic chapter in the ES includes a section on assessment methodology, which sets out the approach, guidance and best practice used in the individual assessments.

3. Environmental Impact Assessment

Introduction

- 3.1 The requirements of EIA are set out in EC Directives 85/337/EEC and 97/11/EC (the Environmental Impact Assessment (EIA) Directives) and the Public Participation Directive 2003/35/EC, as codified in EC Directive 2011/92/EU (Document 3.1.30). These are transposed into UK law by Section 105A of the Highways Act 1980 (as amended), implemented by the Highways (Assessment of Environmental Effects) Regulations 1999 (as amended) (Document 3.1.24) and the Highways (Environmental Impact Assessment) Regulations 2007 (as amended) (Document 3.1.26). These are often collectively termed the 'EIA Regulations'.
- 3.2 The requirements of the EC Directive 2011/92/EU are set out in Appendix 5.3 of the March 2016 ES together with the requirements of the new EIA Directive 2014/52/EU (Document 3.1.29) which is required to be transposed into UK law by 16th May 2017.
- 3.3 Directive 2014/52/EU sets out arrangements for a transitional period from the regime laid down by Directive 2011/92/EU. These transitional measures require that the provisions of Directive 2011/92/EU apply to schemes for which the EIA process has been initiated or for which the ES has been submitted within the transitional period. Therefore, for the purposes of the published scheme, Directive 2011/92/EU (Document 3.1.30) remains the relevant consideration. However, as a matter of good practice, the measures required by the amended Directive (for example, consideration of effects in relation to health and climate change) have been considered where appropriate within this ES.
- 3.4 EIA is mandatory for projects listed in Annex I of the EIA Directive (Document 3.1.30). Annex II projects that are likely to have significant environmental effects having regard to the selection criteria in Annex III

will also require statutory EIA. The published scheme is an Annex I project by virtue of it being a motorway. EIA is accordingly mandatory.

Design development

3.5 Environmental constraints and challenges were, and remain, a key consideration during the development of the Scheme's design. Mr Matt Jones in his Proof of Evidence (WG 1.1.1) explains how the alignment of the published scheme was established taking into consideration the following sensitive environmental designations and features of national and international importance (see also Appendix A to this Proof of Evidence):

- a) River Usk SAC and SSSI;
- b) Severn Estuary SAC, Special Protection Area (SPA), Ramsar and SSSI;
- c) Gwent Levels - Rumney and Peterstone SSSI;
- d) Gwent Levels - St Brides SSSI;
- e) Gwent Levels - Nash and Goldcliff SSSI;
- f) Gwent Levels - Whitson SSSI;
- g) Gwent Levels - Redwick and Llandevenny SSSI;
- h) Magor Marsh SSSI;
- i) Gwent Levels - Magor and Undy SSSI;
- j) Newport Transporter Bridge
- k) Devil's Quoit SAM
- l) Moated site at Undy SAM
- m) Wilcrick Hill Camp SAM

- n) Gwent Levels Historic Landscape of Outstanding Historic Interest in Wales
 - o) Llanfihangel near Rogiet Conservation Area
- 3.6 There are also several listed buildings close to the Scheme, and the registered Gwent Levels Landscape of Outstanding Historic Interest covers much of the new section of motorway. Cultural heritage matters are addressed in the Proof of Evidence of Mr Mick Rawlings (WG 1.9.1).
- 3.7 The components of the River Usk SAC that are of particular concern for the published scheme are migratory fish (Atlantic salmon, twaite shad, allis shad, and sea lamprey) and otter. Those matters are addressed in the Proof of Evidence of Mr Keith Jones (WG 1.18.1).
- 3.8 The components of the SSSIs that are of particular concern for the published scheme are reed and ditch habitats, invertebrates supported by those habitats and shrill carder bee. I describe those components later in this Proof of Evidence in Section 7. The potential effects of the published scheme on those components and other ecological assets are addressed in the Proof of Evidence of Mr Keith Jones (WG 1.18.1).
- 3.9 Also of importance are the communities that are close to the published scheme – Castleton, Duffryn, Pye Corner, Llandeenny, Magor, Undy, Llanfihangel near Rogiet – as well as individual farms and dwellings. The potential effects of the published scheme on those living and working close to the M4CaN are addressed in particular in the proofs of evidence of my colleagues Nick Rowson (Landscape, WG 1.8.1), Ms Julia Tindale (Agricultural Land Use and Non-Motorised Users, WG 1.10.1), Mr Phil Evans (Noise and Vibration, WG 1.14.1) and Mr Michael Bull (Air Quality, WG 1.12.1).

Mitigation

- 3.10 Mitigation measures that are integral to the design of the published scheme are both essential and fully committed to by the Welsh Government and the ECI contractor. I define essential mitigation as measures affecting and reducing the significance of adverse effects, i.e. those measures taken into account when assigning significance in EIA terms, and that can be provided under the requirements and powers of the Highways Act 1980 (as amended) (Document 3.1.5). Further mitigation measures, some of which are not design related, that are fully committed to by the Welsh Government and the ECI Contractor are set out in the Commitments Register (Appendix 18.1 of the ES; see also paragraphs 4.5 to 4.10 of this proof).
- 3.11 Amended Regulation 105A of the Highways Act sets out the minimum information that an environmental statement must include as defined by Annex IV of Directive 97/11/EC. Annex IV includes, at (5) (b), “*a description of the measures envisaged in order to avoid, reduce, and, if possible, remedy significant adverse effects*” (i.e. mitigation measures).
- 3.12 Section 246 of the Highways Act 1980 (as amended) (Document 3.1.5) provides the power for a highway authority to “*acquire land for the purpose of mitigating any adverse effect which the existence or use of a highway constructed or of land for improved by them, or proposed to be constructed or improved by them, has or will have on the surroundings of the highway*”.
- 3.13 HA205/08 (DMRB 11.2.5) (Document 13.2.6) on the ‘Assessment and Management of Environmental Effects’ describes the hierarchical approach to mitigation at paragraph 1.42. It states that “*the iterative assessment and design processes should seek to incorporate measures to avoid or reduce the significant environmental effect following a hierarchical system, where avoidance is always the first mitigation measure to be considered*”:

- a) *Avoidance – consider and incorporate measures to prevent the effect (for example, consider alternative design options or phase the project to avoid environmentally sensitive periods).*
- b) *Reduction – where avoidance is not possible, then methods to lessen the effect should be considered and incorporated into the project design.*
- c) *Remediation – where it is not possible to avoid or reduce a significant adverse effect, then measures to offset the effect should be considered”.*

3.14 However, for highway schemes current and emerging legislation and guidance use a variety of words to mean mitigation, including avoid, reduce, prevent, remedy and offset with the last two being used interchangeably.

3.15 Mitigation measures can result in an enhancement of the existing situation. However, mitigation measures are designed first to avoid or prevent a main or likely significant adverse effect; or to reduce a main or likely significant adverse effect; or to remedy or offset a main or likely significant adverse effect. The implementation of mitigation measures for M4CaN follows this hierarchical approach. Enhancement can be provided at any stage in the mitigation hierarchy and in some instances mitigation and enhancement can occur on the same plot of land.

3.16 As a last resort, if the mitigation measures by themselves are considered insufficient compensation may be provided in a variety of forms (e.g. financial payments, the enhancement or creation of new habitats outside of the scheme limits). Indeed, the Ecological Impact Assessment guidelines published by CIEEM (Document 11.2.9) distinguish between *mitigation which “normally involves measures that reduce and/or minimise impacts within the site boundary”* and compensation which *“involves measures, such as new habitat creation,*

taken beyond the site boundary that offset the residual impacts that have a detrimental impact upon the conservation objectives for a protected site". It should be noted that the CIEEM definitions are concerned with sites designated under the Habitats and Birds Directives and as such the term compensatory measures, rather than compensation, is more correct. As described above at paragraph 3.14, given the various words used to describe mitigation within the EIA Regulations, compensation measures are still mitigation within the context of Section 246 of the Highways Act 1980.

- 3.17 Within the Scheme the loss of coastal grazing marsh under the footprint of the new section of motorway to the south of Newport is being mitigated by the provision within the draft Orders, both of land within and immediately adjacent to one or more of the affected SSSIs that is suitable for arable reversion and enhancement (from a biodiversity perspective) of existing grassland. I believe that this strategy is agreed in principle with NRW although there is an ongoing discussion with them about the extent of the requirement, particularly at Caldicot Moor. It was set out originally in the SSSI Mitigation Strategy (March 2016 ES Appendix 10.35; Document 2.3.2). Since then further work informed by regular dialogue with NRW has been undertaken such that an updated SSSI Mitigation Strategy is included in the December 2016 ESS as Appendix SR10.35; Document 2.4.14). Further details of the SSSI Mitigation strategy are provided in the Proof of Evidence of Mr Keith Jones (WG 1.18.1).

EIA Methods and Guidance

- 3.18 The approach to EIA is set out in Chapter 5 of the ES (Document 2.3.2). That chapter is designed to provide a methodological framework for the EIA that is reported on an EIA topic by topic basis in Chapters 7 to 16 of the ES. In those chapters the assessment methodology is described within the main text of the March 2016 ES Volume 1 bar two instances where an explanation of the assessment methods used is appended (see ES Volume 3) to the topic chapter and a condensed

shorter version provided in the main text (i.e. for Chapter 7 – Air Quality and Chapter 13 – Noise and Vibration).

- 3.19 The EIA was undertaken in accordance with EIA Regulations as described above, DMRB Volumes 10 ‘Environmental Design’ (Document 6.1.8 Volume 10) and 11 ‘Environmental Assessment’ (Document 6.1.8 Volume 11) together with relevant IANs and best practice guidance as set out in each assessment topic chapter.
- 3.20 IAN 125/09(W) (Document 6.1.12) sets out the ten environmental assessment topic headings to be used in the preparation of Environmental Statements in Wales. The March 2016 ES (Chapters 7 to 16) (Document 2.3.2) follows that advice.
- 3.21 With regard to the assessment of cumulative effects the March 2016 ES (Chapter 17; Document 2.3.2) adopted the guidance provided in Advice Note 17 which was published by the Planning Inspectorate in 2015. The reason for this departure from the guidance provided by the DMRB was the brevity of the DMRB guidance and the fuller and more up to date Planning Inspectorate guidance as explained at paragraph 17.3.14 of the March 2016 ES (Document 2.3.2). However as a consequence of this approach, although the potential for adverse or beneficial impacts or significant (cumulative) effects is recognised in March 2016 ES Tables 17.11 and 17.12, no attempt has been made to assign levels of significance of any cumulative effect (for example, as set out in DMRB 11.2.6 (HD48/08) Table 3.2, or suggested in Part IV of DMRB 11.2.5 (HA205/08); Document 6.1.8).

Scoping

- 3.22 In accordance with best practice and HA204/08 (DMRB 11.2.4) (Document 6.1.8), a scoping exercise was undertaken and an Environmental Statement Scoping Report (the ‘Scoping Report’) (Appendix 5.1 (Volume 3) of Document 2.3.2) was published in August 2015.

3.23 The objectives of scoping are:

- a) To identify potential environmental issues associated with the proposed development
- b) To identify those environmental issues which should be considered further in the final reports to accompany the draft Orders (i.e. to scope out minor topics and scope in significant issues)
- c) To identify what baseline surveys and other data gathering investigations are required
- d) To identify and agree with statutory and non-statutory consultees as appropriate what methods and criteria will be used to assess, predict and evaluate the environmental effects of the proposal
- e) To outline potential mitigation measures
- f) To outline the structure and content of the ES
- g) To provide a basis for consultation, where appropriate, with statutory and non-statutory consultees on the relevant environmental issues.

3.24 The scoping report was issued to statutory consultees. Newport City Council (NCC), Natural Resources Wales (NRW) and Cadw provided responses, copies of which are included in Appendix 5.2 of the ES (Volume 3 of Document 2.3.2).

Consultation

3.25 Consultation is a key component of EIA. As described in the Proof of Evidence of Mr Matt Jones (WG 1.1.1). Public Information Exhibitions were held at Castleton, Newport, Nash, Magor and Caerleon during October 2015. This was followed in March 2016 by the draft Orders Exhibitions at the same venues which showed the scheme as

published. Each of these exhibitions contained a significant environmental element.

- 3.26 Since March 2015 members of the environment team have held numerous meetings on a one-to-one basis with statutory consultees and others with a responsibility and concern for the environment. These and other meetings concerned specifically with environmental matters are listed in chronological order up to mid-January 2017 in Appendix B to this Proof of Evidence. Going forward meetings will continue to be held and arranged with stakeholders with an interest in environmental matters.
- 3.27 Two meetings have been held with the Environmental Liaison Group (ELG), on 11th May 2015 and 13th November 2015. This group was established by Welsh Government prior to the ECI contract start and comprises Welsh Government, the Government's advisers, the Contractor and statutory consultees – NRW, NCC, Cadw, Monmouthshire County Council (MCC) and Cardiff City Council (CCC).

Environmental Impact Assessment

- 3.28 HA200/08 (DMRB 11.1.1) (Document 6.1.8) promotes an environmental assessment approach that allocates effort according to the likely significance of environmental effects, the type of decision that is to be taken and the risk, and consequences, of getting the assessment wrong. The approach adopted for the published scheme was for a detailed assessment, owing to the complexity and constraints of the Scheme and its potential to cause significant effects on environmental resources and receptors.
- 3.29 The objective of the environmental impact assessment was to gain an appreciation of the significant environmental effects predicted to result from the Scheme. The process involves forecasting the effects by comparing a scenario 'with the Scheme' against one 'without the Scheme' over time.

3.30 For the published scheme the following baseline and future years are used, where appropriate (March 2016 ES paragraph 1.11.4; Document 2.3.2):

- a) The existing baseline situation in 2014 – 2016 depending on the availability of existing data and new surveys
- b) The start of construction – Spring/Summer 2018
- c) A future date of Autumn/Winter 2021 which is when M4CaN would be completed/open to traffic (the 'Opening Year')
- d) A future date of Spring/Summer 2022 by which the works associated with the reclassification of the existing M4 would be completed
- e) A future year of 2037, which is the 'Design Year' 15 years after the year of opening of M4CaN.

3.31 After scoping, the main stages in EIA are:

- a) Data review involving the compiling and reviewing of available data and/or the undertaking of baseline surveys to generate site specific data (i.e. the establishment of a baseline)
- b) Assessment and design iteration, whereby the likely significant effects of the development during the construction and operational stages of its life are assessed and feedback is provided to the design and engineering team(s) to modify the development in order to avoid, reduce and, where possible, remedy any significant adverse effects on the environment
- c) Assessment of the construction methodology and the final design of the development
- d) Identification of any residual effects and any further mitigation or compensation requirements

e) Preparing the ES to report the finding of the EIA.

- 3.32 As stated above, the vast majority of the mitigation measures incorporated into the published scheme is through its design. Mitigation has not been an ‘add-on’, but is an integral part of the Scheme development process. I have explained the different approaches to mitigation and the difference between mitigation and compensation above, and at the end of this section I explain how, in Wales for EIA purposes mitigation is applied to highway projects.
- 3.33 During and following scoping, numerous environmental and particularly ecological surveys were instigated to provide up-to-date information and data on the resources and assets of the environment potentially affected by the published scheme. Summaries of these surveys are included in Volume 1 of the ES (Document 3.2.4, 2.4.4 and 2.4.14) with survey reports being provided as appendices in ES Volume 3. The details of these surveys are also addressed by my environmental colleagues in their proofs of evidence (see WG 1.8.1, WG 1.9.1, WG 1.10.1, WG 1.12.1, WG 1.14.1, WG 1.15.1 and WG 1.18.1)).
- 3.34 The Highways (Assessment of Environmental Effects) Regulations 1999 (as amended) (Document 3.1.24) referring to Annex IV of the EC Directive state that the purpose of an EIA is to describe “*the likely significant effects of the development on the environment, which should cover the direct effects and any indirect, secondary, cumulative, short, medium and long term, permanent and temporary, positive and negative effects of the development, resulting from:*
- a) *The existence of the development;*
 - b) *The use of natural resources;*
 - c) *The emission of pollutants, the creation of nuisances and the elimination of waste, and the description by the applicant of the forecasting methods used to assess the effects on the environment”.*

- 3.35 DMRB 11.2.5 (Document 13.2.6) provides guidance on the determination of significance of environmental effects of highway schemes in the UK. Where and whenever possible the guidance advocates a three stage process that includes:
- a) Assigning environmental value to (or sensitivity of) a resource or receptor
 - b) Assigning a level of impact
 - c) Assigning a level of significance.
- 3.36 For most environmental assessment topics, the guidance provides a five-point scale for assigning environmental value or sensitivity, and a five-point scale, (seven in the case of landscape and visual assessment) for assigning the magnitude of impact. Provided there is sufficient information to value a receptor and to understand the magnitude of the effect, the assessment methodology assigns a level of significance via a significance matrix. This generally allows a five point scale – *very large, large, moderate, slight, neutral* for significance of the effect to be determined. As a general rule of thumb and in the context of the EIA regulations a significant effect is one where the significance of the effect is *moderate* or greater.
- 3.37 In Wales, it is an EIA requirement for the effects of a proposed development to be assessed both before and after mitigation. The significance of effect therefore may reduce as a result by one or more steps on the five-point scale, or in the case of landscape the seven-point scale for significance of effect recommended by the DMRB. For example, a one-step change could be from *moderate adverse* to *slight adverse*, or from *slight adverse* to *neutral*, whereas a two-step change could be from *large adverse* to *slight adverse*.

Mitigation for EIA Purposes

- 3.38 I have defined mitigation and explained how mitigation is applied to highway projects at paragraphs 3.10 to 3.16 above in this Proof of Evidence. Chapter 2 of the March 2016 ES (at sections 2.11 and 2.12; Document 2.3.2) sets out the environmental measures that form part of the Scheme, described as embedded mitigation, and those that are additional, but are still part of the Scheme. This construct is to enable the ES to comply with the recommendation of HA205/08 (Document 13.2.6, paragraph 2.9) that in Wales assignment of significance before and after the consideration of mitigation measures is undertaken to allow for the case or reason for, and effectiveness of mitigation to be described. Paragraphs 5.4.33 to 5.4.35 in the March 2016 ES describe how the recommendation was taken forward and the effect of mitigation is shown in the summary table at the end of each assessment topic chapter.
- 3.39 The reason that I use the word construct above is that in reality highway schemes are not designed, nor built, without mitigation measures being incorporated and that the best way to ensure effective mitigation is to make it an integral part of the highway design. That was the process adopted on M4CaN and as a consequence it is difficult to disaggregate for assessment purposes mitigation measures that are integral to the design.

4. March 2016 Environmental Statement

Structure

4.1 The Environmental Statement (Document 2.3.2) is the report of the EIA. It comprises the following volumes:

- a) Non-Technical Summary in English and Welsh
- b) Volume 1 – Technical Assessment Report (in 2 folders)
- c) Volume 2 – Figures (in 3 folders)
- d) Volume 3 – Technical Appendices (in 21 folders)

4.2 In addition to the environmental assessment topic chapters (Chapters 7 to 16), Volume 1 also includes six ‘introductory chapters’, namely:

Chapter 1 – Introduction

Chapter 2 – Scheme Description

Chapter 3 – Scheme Construction

Chapter 4 – Scheme Development and Alternatives Considered

Chapter 5 – Approach to Environmental Assessment.

Chapter 6 – Legislative and Policy Context

4.3 Following on from the last assessment topic chapter, there are two chapters concerned with the Assessment of Cumulative Effects (Chapter 17) and Environmental Management (Chapter 18). Chapters 19 and 20 provide a Conclusion to the EIA and References (by chapter) respectively.

4.4 Chapters 2 and 3 are particularly important as they, together with their corresponding figures and appendices, present a detailed description of the published scheme and how the Scheme would be constructed.

The information in these two chapters, including their appendices and figures form the basis for the EIA.

Register of Environmental Commitments

- 4.5 A Register of Environmental Commitments (The Commitments Register) was established in the March 2016 ES as Appendix 18.1 and expanded in both the September 2016 and December 2016 ES Supplements.
- 4.6 The Commitments Register includes historic commitments (i.e. in The Plan (Document 4.5.7), published by Welsh Government in July 2014, in the Strategic Habitats Regulations Assessment (SHRA), the Strategic Environmental Assessment Post-Adoption Statement, the WeITAG Stage 1 & Stage 2 Report, the DMRB Stage 2 Environmental Report) as well as those made in the March 2016 ES and subsequent supplements (including appendices). It also includes commitments made in subsequent meetings with statutory consultees.
- 4.7 The Commitments Register is important because under the Highways Act there is no equivalent mechanism such as the ability to enforce conditions in a planning permission. Put simply, the commitments are in lieu of planning conditions. Although these commitments are non-statutory I understand that Welsh Government treats them as binding.
- 4.8 As well as providing a vehicle for commitments that are binding on Welsh Government and/or the ECI contractor it provides a useful framework for future compliance audits. It should also be noted that, irrespective of other commitments, Commitment 95 provides a catchall in that:

“The Scheme will be constructed in accordance with the design as set out in the ES, the ES Supplement and other relevant design documents”.

- 4.9 Commitments can be added to the Register at any time. The Commitments Register is a draft document that will continue to be expanded up to and during the Public Local Inquiry to record binding commitments made by, principally the Welsh Government, but also the ECI contractor and its design team with respect to M4CaN. Towards the end of the Public Local Inquiry a draft recording all previous commitments and those made during the Inquiry will be issued as a final deposit document. Should the Scheme proceed, further commitments can continue to be recorded at any time during the life of the Scheme as required.
- 4.10 The Commitments Register is designed to be monitored and audited during construction of the Scheme (see section on Environmental Management during Construction later in this Proof of Evidence). Following construction and the opening of the new section of motorway any continuing and/or outstanding commitments would be taken forward into the documentation for the ECI contractor's 5 year aftercare period, and following that into the documentation for longer term highway maintenance that is currently undertaken by SWTRA.

Deposit Points

- 4.11 In accordance with statutory procedures the ES and the SIAA were put on deposit at locations available to the public to view. The deposit locations were at:
- a) Orders Branch, Transport, Department of Economy Science and Transport, Welsh Government, Cathays Park, Cardiff, CF10 3NQ;
 - b) Newport City Council, Civic Centre, Godfrey Road, Newport, NP20 4UR
 - c) Monmouthshire County Council, County Hall, Rhadyr, Usk, NP15 1GA

- d) Monmouthshire County Council, Innovation House, Wales 1
Business Park, Magor, Monmouthshire, NP26 3DG
 - e) Newport Central Library, John Frost Square, Newport, NP20 1PA
- 4.12 A hard copy of the ES and the SIAA together with an electronic copy on DVD of both documents were issued to the following statutory consultees – Natural Resources Wales (NRW) Cadw, Newport City Council (NCC) and Monmouthshire County Council (MCC).
- 4.13 Electronic copies on DVD of both documents were also made available to Associated British Ports (ABP) and the following non statutory organisations – RSPB Cymru, Gwent Wildlife Trust, Wildlife Trust Wales. Friends of the Earth Cymru, CPRW, the Woodland Trust, Buglife, the Bat Conservation Trust, and the Campaign for Better Transport.

Dissemination of the Non-Technical Summary (NTS)

- 4.14 The NTS (and the Scheme Assessment Report) were delivered to all residential properties within approximately 100 metres of the boundary of the Scheme (i.e. both the new section of motorway to the south of Newport and the length of existing M4 to be reclassified). Where, for example, the majority of a group of residential properties were within the 100 metre zone, but a few were not, those few were included in the delivery process. The NTS was sent also to the Statutory Consultees and any organisation or member of the public who requested a copy. Copies of the NTS were also made available at the deposit points listed above.

5. September 2016 Environmental Statement Supplement

Introduction

- 5.1 The draft Orders and an accompanying ES for the scheme were published on 10th March 2016. Since then, 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. Those processes have resulted in new information becoming available that could have a bearing on the EIA as reported in the March 2016 ES. The purpose of the September 2016 ES Supplement (ESS) (Document 2.4.4) was to ensure that that all relevant information had been captured and disseminated up to that point in time, so that the fullest up to date environmental information would have been available to the Public Local Inquiry which was originally programmed to start on November 1st, 2016.
- 5.2 No request had been made by any parties for Welsh Government to provide updated environmental information. The September 2016 ESS was provided voluntarily as an aid to the Inquiry by:
- a) Correcting factual errors;
 - b) Giving greater clarity to some environmental aspects of the published scheme;
 - c) Providing new information and/or data, and
 - d) Providing an environmental assessment of design changes requiring a supplementary draft Order or a significant modification to an existing draft Order.

Errata

- 5.3 Errata were explained in Part A of the document. The errata relate only to correcting existing factual information within the text and figures in the March 2016 ES that have been identified either by the design team

or third parties in correspondence with the Welsh Government. They do not include clarification of any apparent discrepancies or differences in interpretation of methodologies raised in objections and/or representations. Those have been addressed by Welsh Government in its response to the objection, or are addressed in the appropriate Proof of Evidence.

Clarifications

- 5.4 Part B of the document provided 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).

New information

- 5.5 Part C of the document provided updated and/or additional information that had become available since the publication of the March 2016 ES. It included updates to the Drainage Strategy (Appendix S2.2) and Reen Mitigation Strategy (Appendix S2.1) provided as appendices to Chapter 2 of the March 2016 ES together with updates to the status of some recent Welsh legislation.
- 5.6 Most new information provided was in the form of appendices, with the prefix R denoting a replacement update to an appendix included in the March 2016 ES, or the prefix S denoting a new supplementary appendix. Where appropriate a commentary was provided in the main text to describe the effect (if any) the new information had on the assessment reported in the March 2016 ES document.
- 5.7 With regard to cultural heritage additional survey information regarding the Pye Corner Barrage Balloon Tethers (HB087) was provided. In light of that information the significance of effect was assessed as large adverse, a significant effect in EIA terms. Additional non-designated

Historic Landscape Character Areas (HLCAs) were also identified, and corresponding amendments and additions to the text provided in Chapter 8 of the March 2016 ES were made. Further photomontages showing additional views of the Scheme were included also.

5.8 Since the publication of the March 2016 ES on the 10th of that month further ecological surveys have been undertaken to address a number of data issues that arose during the corresponding surveys undertaken in 2015. Most of these relate to matters of access. The following 2016 survey reports are appended to the September 2016 ESS (Document 2.4.4):

- a) Wintering Birds (September 2016 ESS, Appendix S10.4)
- b) Breeding Birds (September 2016 ESS, Appendix S10.5)
- c) Bats (September 2016 ESS, Appendix S10.7)
- d) Great crested newt (September 2016 ESS, Appendix S10.6).

5.9 For each survey, an assessment of the results against the findings of the March 2016 ES is provided in the main text of the September 2016 ESS.

5.10 Part C also included an account of the updates to the Environmental Permitting Regulations which came into force on 6th April 2016 and updates to Appendix 11.1 of the March 2016 ES and its supporting Contaminated Land (CL) annexes. In terms of volume of information these annexes comprised the majority of the September Supplement.

5.11 With regard to the water environment Part C provided 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) was also provided. None of the

additional data materially altered the assessment and conclusions of the March 2016 ES with respect to the water environment.

- 5.12 Finally, Appendix 17.2 (Planning Applications (for cumulative assessment)) and the draft Commitments Register (March 2016 ES Appendix 18.1) were updated (September 2016 ESS Appendix R18.1).

Scheme refinement and modifications

- 5.13 Since the publication of the draft Orders and the 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 the published scheme.
- 5.14 The development of the design has resulted in the realignment of Bencroft Lane at the extreme eastern end of the published scheme and the redesign of the Docks Way junction. The former requires additional land and is the subject of a draft Supplementary Order. The latter redesign has been undertaken within land set out in the current draft Orders. Both of these design developments are explained in Mr Ben Sibert's Proof of Evidence (WG 1.5.1). The environmental assessments of these design developments are included within the main text of the ES Supplement.
- 5.15 In addition to the above, the comments and objections received from those affected by the draft Orders has resulted in a number of minor modifications to the Scheme design. These are also described in the Proofs of Evidence of Mr Ben Sibert (WG 1.5.1) and Ms Julia Tindale (WG 1.10.1).

6. December 2016 Environmental Statement Supplement

Introduction

- 6.1 Following the delay to the start of the Public Local Inquiry it was decided to prepare a second Environmental Statement Supplement to capture various environmental and EIA matters that would have been introduced into the Public Local Inquiry had it commenced on November 1st 2016. The second ES Supplement (Document 2.4.14) was published at the same time as the Cabinet Secretary for Economy and Infrastructure's (CSEI) announcement that M4CaN should proceed following his review of the project.
- 6.2 The December 2016 ESS follows the same format and style as the September 2016 ESS and comprises four parts, A to D: Errata, Clarifications, New Information and Scheme refinement and modifications.

Errata

- 6.3 Part A of the December 2016 ESS is concerned with errata and sets out factual errors, inconsistencies and omissions.

Clarifications

- 6.4 Part B of the December 2016 ESS provides clarification and more detail to the Buildability Report (March 2016 ES Appendix 3.1) and the pre-CEMP (March 2016 ES Appendix 3.2). Clarification in the Buildability Report is provided predominantly in the form of plans, drawings, sketches and figures, including a set of detailed construction sequence plans for a section of the Caldicot Levels. These are described in the Proof of Evidence of Mr Barry Woodman (WG 1.6.1). The construction sequence across part of the Gwent Levels, including an explanation of vegetation clearance and species removal was presented and discussed with NRW on 28th November 2016.

Additional information

- 6.5 Part C of the December 2016 ESS provides updated and/or additional information that has become available since the publication of the September 2016 ESS. It includes the reports of the 2016 Dormouse Survey, two 2016 Bat Surveys (in respect of buildings and structures, and trees) (referred to the September 2016 ESS) together with a report on the Common crane. It also includes mitigation strategies in respect of dormice, bats, great crested newts and water voles. These will be used to inform the protected species licence applications to NRW which would be applied for prior to construction, further details of which can be provided by Mr Keith Jones (WG1.18.1), Mr Jon Davies (WG 1.19.1) and Mr Richard Green (WG 1.20.1). The SSSI Mitigation Strategy (March 2016 ES Appendix 10.35) is also updated following comments from NRW together with Appendix R18.1 (Register of Environmental Commitments) which was first updated in the September 2016 ESS.
- 6.6 A draft Navigation Risk Assessment has been undertaken with stakeholders in respect of navigation on the Rivers Ebbw and Usk and within Newport Docks. The results of that assessment which will be used to inform the Marine Licence application are reported also in Part C (December 2016 ES Appendix SS2.1; Document 2.4.14).
- 6.7 Since the publication of the draft Orders NRW has stated its intention to issue guidance on water quality standards for the Gwent Levels. As a consequence, in Part C of the December 2016 ESS, the DMRB risk assessments for the proposed water treatment areas (ES Appendix 16.3) have been updated in line with the new guidance, further details of which are provided by Mr Richard Graham in his Proof of Evidence (WG 1.15.1). Part C of the December 2016 ESS also provides, as an appendix, an assessment for all consented and licenced sites regulated under health and safety regulation that could be affected by the Scheme, further details of which can be provided by Mr Andy Clifton (WG 1.11.1).

Scheme refinements and modifications

- 6.8 Part D of the December 2016 ESS is concerned with two design changes that require modifications to the published draft Orders, and with the ramifications of the changes in predicted traffic flows brought about by the recent publication, by the Department of Transport, of new TEMPRO values for England and Wales, the announcement in the 2016 Budget of a half toll for the Severn Crossings and the use of the DfT's bespoke Toll Model. For further details see the Proof of Evidence of Mr Bryan Whitaker (WG 1.2.1).
- 6.9 The first design modification is that the elevation of the bridges across Newport Docks and the River Usk has been raised together by a maximum of approximately 1.54 metres to take into account future changes in retained water level within the docks due to climate change and a reconsideration of the navigation safety zone. The maximum increase relates to the height of the two towers and the centre part of the bridge deck carrying the proposed new section of motorway, including the section over the River Usk and the Junction Cut. The east and west viaduct approaches between the area of maximum raising and the embankments at each end, the elevations and locations of which remain the same, are not raised as much and have a steeper gradient than previously; for further details see the Proof of Evidence of Mr Ben Sibert (WG 1.5.1). Part D of the December 2016 ESS provides an update to the visual impact assessment due to raising the bridge which concludes (at paragraph 5.3.4) that there would be no change to the overall assessment, nor any significant change at specific locations with a view of the bridge.
- 6.10 The second design modification relates to the removal of one retaining wall, and the creation of another, on the Docks Way Link Road between the Docks way Junction and the A48 Southern Distributor Road. These changes do not alter the overall assessment and conclusions of the March 2016 ES.

6.11 The new TEMPRO values, the half toll and changes to the tolling model for the Severn Crossings have the potential to affect predicted future year (2022 and 2037) traffic flows with consequential potential effects on changes in noise levels, air quality and carbon emissions. These, together with an explanation of the TEMPRO and traffic changes, are reported in Part D of the December 2016 ESS. In some locations the new traffic forecasts have resulted in increases in predicted traffic flows, primarily on the M48 and M4 near to the Severn Crossing tolls and in others, particularly those further west, in a decrease in traffic flows. However, in respect of noise, air quality and carbon these changes do not affect the overall conclusions set out in the March 2016 ES; for further details see the respective proofs of evidence of Mr Phil Evans (WG 1.14.1), Mr Michael Bull (WG 1.12.1) and Mr Tim Chapman (WG 1.13.1).

7. Assessment of Implications on European Sites

Introduction

- 7.1 Assessment of Implications on European Sites (AIES), or to give it its full title in relation to highway projects ‘Assessment of Implications (of Highways and/or Roads Projects) on European Sites (including Appropriate Assessment)’ is more widely known as Habitats Regulations Assessment (HRA).
- 7.2 AIES is not part of EIA. Although it may be concerned with the same environmental features and/or assets, it is required under separate legislation and enquires of the likely effects of a proposed scheme on a European Site. For this reason, the AIES has been reported separately from the EIA.
- 7.3 In the UK, the Conservation of Habitats and Species Regulations 2010 (the Habitats Regulations) (Document 3.1.22) give force to the EC Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora, which is also known as the Habitats Directive (Document 3.1.21).
- 7.4 Regulation 61 of the Habitats Regulations states that:
- a) *“A competent authority”* (in this case the Welsh Ministers), *“before deciding to undertake, or give any consent, permission or other authorisation for, a plan or project which –*
 - i. *Is likely to have a significant effect on a European site (either alone or in combination with other plans or projects), and*
 - ii. *Is not directly connected with or necessary to the management of that site, must make an appropriate assessment of the implications for that site in view of that site’s conservation objectives.*

- b) *A person applying for any such consent, permission or other authorisation must provide such information as the competent authority may reasonably require for the purposes of the assessment or to enable them to determine whether an appropriate assessment is required.*
- c) *The competent authority must for the purposes of the assessment consult the appropriate nature conservation body” (in this case NRW) “and have regard to any representations made by that body within such reasonable time as the authority specify.*
- d) *They must also, if they consider it appropriate, take the opinion of the general public, and if they do so, they must take such steps for that purpose as they consider appropriate.*
- e) *In the light of the conclusions of the assessment, and subject to regulation 62 (considerations of overriding public interest), the competent authority may agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the European site or the European offshore marine site (as the case may be).*
- f) *In considering whether a plan or project will adversely affect the integrity of the site, the authority must have regard to the manner in which it is proposed to be carried out or to any conditions or restrictions subject to which they propose that the consent, permission or other authorisation should be given”.*

7.5 In order to inform Regulation 61 of Habitats Regulations, a Statement to Inform an Appropriate Assessment (SIAA) (Document 2.3.4) has been prepared on the possible impacts associated with the published scheme on the River Usk Special Area of Conservation (SAC), the Severn Estuary SAC, the Severn Estuary Special Protection Area (SPA); the Severn Estuary Ramsar; and the Wye Valley and Forest of Dean Bat Sites SAC.

- 7.6 DMRB 11.4.1 (also known as HD 44/09) (Document 6.1.8), published in February 2009, provides guidance on the assessment of highways and/or roads projects in accordance with the provisions of the Habitats Regulations.
- 7.7 HD44/09 (DMRB 11.4.1) defines integrity as "*the coherence of its ecological structure and function, across its whole area, that enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was classified*" (HD 44/09 paragraph 3.7).
- 7.8 AIES is a five stage process. These stages are:
- Stage 1: Screening
 - Stage 2: Appropriate Assessment
 - Stage 3: Alternative Solutions
 - Stage 4: Imperative Reasons of Overriding Public Interest (IROPI)
 - Stage 5: Compensatory Measures.
- 7.9 A screening exercise was carried out in October 2015, which identified that the following European Sites could be significantly affected by the Scheme proposals and should therefore proceed to Stage 2:
- a) River Usk SAC;
 - b) Severn Estuary SAC;
 - c) Severn Estuary SPA;
 - d) Severn Estuary Ramsar site; and
 - e) Wye Valley and Forest of Dean Bat Sites SAC.
- 7.10 NRW agreed with the conclusions of the screening exercise and confirmed that the above sites needed to be subject to further

assessment (see paragraph 4.1.9 of Annex 1 of NRW's letter of 5 November 2015 (Appendix A1 of the SIAA; Document 2.3.4)). A summary of the likely significant effects of the published scheme on the above SAC's identified at the Screening stage is included in the SIAA (Document 2.3.4), which was published at the same time as the draft Orders and the March 2016 ES.

- 7.11 The SIAA is to inform the report of Stage 2 of the AIES process. The SIAA concluded that the M4CaN project will not have an adverse effect on the integrity of the River Usk SAC; Severn Estuary SAC, SPA and Ramsar; and the Wye Valley and Forest of Dean Bat Sites SAC, either alone or in combination with other projects or plans. Further information on the AIES process and the SIAA is contained within the Proof of Evidence of Mr Keith Jones (WG 1.18.1).

NRW's (OBJ0268) Response to the SIAA

- 7.12 In its letter of 4th May 2016 NRW concluded the following four matters in respect of the SIAA. The first conclusion at paragraph 8.1.2 was that:

“Provided that the measures summarised here are fully implanted” (implemented),” we would agree that adverse effects on migratory fish features of the River Usk/Afon Wysg SAC, Severn Estuary/ Môr Hafren SAC and Severn Estuary Ramsar site can be avoided. We would require this matter to be addressed to our satisfaction within the Statement of Commitments, in advance of giving our formal view on the appropriate assessment.”

- 7.13 Commitments 63 and 138 in the Commitments Register refer to migratory fish. Commitment 63, included in the March 2016 ES at Appendix 18.1 states:

“Subject to further discussion piling to install the cofferdam and pylon piles for the east pylon of the River Usk Crossing would be scheduled to avoid the period of highest sensitivity for underwater noise related impacts on migratory fish in the River Usk (March to June inclusive).”

Piling activities would not take place one hour either side of high water”.

- 7.14 Commitment 138 included in the September 2016 ESS at Appendix R18.1 states:

“Measures included in the Surface Water Management Plan, Pollution Prevention Plan and best practice guidelines will be implemented to avoid adverse effects on migrating fish from pollution”.

- 7.15 NRW has not commented formally on whether the commitments satisfy its requirements.

- 7.16 NRW’s second conclusion at paragraph 8.1.3 was that, although it agreed in principle to the assessment in the SIAA that with mitigation measures as described in place adverse effects on otters from the River Usk SAC are not predicted to occur as a result of the M4CaN works, nevertheless:

“We require further information, as set out in our comments on paragraphs 5.2.130 and 5.2.125, before we can give our view in relation to European otter as a feature of the River Usk/Afon Wysg SAC.”

- 7.17 NRW’s reference to paragraph 5.2.130 of the SIAA noted that *“more detailed information as to the specific locations of fencing, planting and mammal crossings will be required”*. Such information is provided in the Environmental Master Plans (March 2016 ES Figure 2.6).

- 7.18 NRW’s reference to paragraph 5.2.125 of the SIAA was concerned with the proximity of dry mammal crossings to the box culverts to be installed along the reens as stated at the end of the third bullet point. NRW also commented that *“the closer the mammal crossing to the culvert, the increased likelihood otters will identify and utilize. Additional details must therefore be provided to support the likely success of these crossings, or designs incorporated closer to the culverts. We also*

advise utilising ledges within the culverts for times of low water levels. Although outside of the scope of consideration within a Statement to Inform an Appropriate Assessment, such proposals would need to be designed in such a way that they do not cause a flood risk, or an increased risk of culvert blockage”.

- 7.19 I can confirm that the majority of the dry mammal crossings would be located within 10 metres of the box culverts, although a few could be up to 50 metres away. I can also confirm that at the detailed design stage detailed engineering and planting plans would be drawn up to ensure adequate connectivity between culverts and mammal crossings and that NRW would be consulted on these matters. Such plans would include the detail of mammal exclusion fencing for example.
- 7.20 The introduction of ledges within culverts, not just for otters but also for other fauna such as water vole is also a matter of detailed design. Examples of otter ledges are set out in Volume 10 of the DMRB in ‘Nature Conservation advice in relation to otters’ (DMRB 10.4.4; HA 81/99; Document 6.1.8). The preliminary design has identified a number of proposed culverts within which mammal ledges can be incorporated without changing the dimensions of the culvert together with others where there is potential to increase the freeboard of the culvert above summer penning levels. This work is ongoing and is referred to further in the proofs of evidence of Mr Keith Jones (WG 1.18.1) and Mr Richard Green (WG 1.20.1).
- 7.21 NRW’s third conclusion at paragraph 8.1.4 was that:
- “We require the results of the 2015/16 overwintering bird survey to have been evaluated and considered, before we can give a view in respect of the likelihood of adverse effects on the qualifying bird species/ assemblages of the Severn Estuary SPA and Ramsar site”.*
- 7.22 The results of the 2015/16 overwintering bird survey were included as Appendix S10.4 in the September 2015 ESS to which NRW responded

(letter of 11 November) ”*With respect to the wintering bird survey, we are now satisfied that the overall survey effort, spanning two full winters (2015-16 and 2014-15) and one partial winter (2014), is sufficient. We recommend that the full data set be used to revise the Habitat Regulations Assessment (HRA) work, with respect to the Severn Estuary Special Protection Area and Ramsar Site*”. Further survey work reported in the September 2016 ES Supplement (Document 2.2.4) confirms the earlier assessment that there would be no adverse effect on the integrity of the relevant European sites. I can confirm however that, for the record, before the end of the Public Local Inquiry the SIAA will be updated to make reference to the results of the 2015/16 overwintering bird survey.

7.23 NRW’s fourth conclusion at paragraph 8.1.5 was that:

“We require the results of the in-progress bat surveys to have been evaluated and their significance considered in relation to assessment of adverse effects on site integrity of the Wye Valley and Forest of Dean Bat Sites/ Safleoedd Ystlumod Dyffryn Gwy a Fforest y Ddena SAC.”

7.24 The in-progress bat surveys to which NRW refer are the reports of the 2016 Bat Hibernation Roost Survey, the Bat Survey 2016 and the Bat Roost Survey of Buildings and Structures 2016. The former was issued as Appendix S10.7 in the September 2016 ESS, whilst the latter two were published as Appendices SS10.2 and SS10.3 respectively in the December 2016 ESS.

7.25 In its letter of 11th November 2016 NRW concurred with the recommendations of the Bat Hibernation Roost Survey 2016. NRW were provided with advance copies of both the Bat Survey 2016 report and the Bat Roost Survey of Buildings and Structures 2016 report on 19th November 2016. To date NRW have not commented on those reports specifically although it has been agreed that those matters would be included in the Statement of Common Ground concerned with

protected species. Such a Statement of Common Ground is currently being considered by NRW.

- 7.26 In my opinion, for the purposes of Regulation 61 on the Conservation of Habitats and Species Regulations 2010, the SIAA together with the subsequent survey reporting described above demonstrates that, beyond reasonable scientific doubt there would be no adverse effect on the integrity of the European Sites considered in the Habitats Regulations Assessment.
- 7.27 Stages 3 to 5 are only required if at the Appropriate Assessment at Stage 2 it is not ascertained that there will not be an adverse effect on the integrity of a European Site. Given NRW's comments above I anticipate that NRW will agree with my view that the Scheme will not result in an adverse effect on the integrity of a European Site. That being the case I consider that Stages 3 to 5 of the AIES process will not be required.
- 7.28 Consequently, the Scheme will comply with the requirement of the Habitats Regulations (Document 3.1.22) so that the Competent Authority will be in a position, if so minded, to agree to the proposed Scheme in accordance with those Regulations so long as it carries out an Appropriate Assessment.

8. Environmental Overview

Introduction

- 8.1 In this section of my Proof of Evidence I will provide an overview of the environment through which the new section of motorway to the south of Newport would run. It is purely descriptive and is based primarily on the baseline information contained within the ES (that is the March 2016 ES (Document 2.3.2), the September 2016 ES Supplement (Document 2.4.4) and the December 2016 ES Supplement (Document 2.4.14)), and the SIAA (Document 2.3.4).
- 8.2 For ease of reference I have divided the proposed new section of motorway in the following text into six sections as follows:
- a) Castleton Interchange (ch 0000 to ch 5000)
 - b) Wentlooge Levels (ch 5000 to ch 8440)
 - c) Rivers Ebbw and Usk (ch 8440 to ch 11380)
 - d) Caldicot Levels (ch 11380 to ch 20050)
 - e) Magor (ch 20050 to ch 22700)
 - f) Magor Interchange (ch 20050 to ch 24000)
- 8.3 The information described is shown pictorially by reference to Appendix A to this Proof of Evidence which combines information from the following sources in the March 2016 ES.
- a) Base mapping as per the general arrangement plans (Figure 2.4)
 - b) Nationally designated nature conservation sites (Figure 10.2)
 - c) Locally designated nature conservation sites and nature reserves (Figure 10.3)

- d) Key habitats and vegetation based on the Phase I Habitat Survey (Figure 10.4)
 - e) Protected and notable species (Figure 10.8) updated to include the 2016 ecological survey information.
 - f) Designated heritage assets (Figure 8.1)
 - g) Areas identified for archaeological excavation or evaluation as set out in the Cultural Heritage Management Plan (Appendix 8.10)
 - h) Areas of potentially contaminated land (Figure 11.1)
- 8.4 Further information on habitats which has informed the following text has been obtained from chapter 10 of the ES, particularly the results of the Phase 1 Habitat Survey (March 2016 ES Appendix 10.4).
- 8.5 Internationally designated sites (Special areas of Conservation (SAC), Special Protection Areas (SPA) and Ramsar Sites), nationally designated sites (Sites of Special Scientific Interest (SSSI) and National Nature Reserves (NNR)), non-statutory Sites of Importance to Nature Conservation (SINC), other nature reserves, key habitats, protected and notable species are described by Mr Keith Jones in his Proof of Evidence (WG 1.18.1). Designated heritage assets and areas identified for archaeological excavation or evaluation are described by Mr Mick Rawlings in his Proof of Evidence (WG 1.9.1). Areas of potentially contaminated land are described in the Proof of Evidence of Mr Andy Clifton (WG 1.11.1).

Castleton Interchange

- 8.6 The Castleton Interchange section extends from the western limit of the Scheme (ch 0000) to the point at which the new section of motorway would cross the western boundary of Gwent Levels - St. Brides SSSI on the Wentlooge Levels (ch 5000) (Appendix A; Sheet 1). In this section the Scheme does not cross any SSSI and no land is required from any SINC.

- 8.7 The Castleton section contains eight of the twelve residential properties that would be demolished as a result of the scheme. These are located predominantly on the north side of the A48 between it and the proposed Castleton Interchange. They are White Cottage, San Remo, The Glen, Quarry Cottage and Myrtle House. The remaining three, The Conifers, Berryhill Cottage and buildings at Berryhill Farm, are located either side of the new section of motorway to the south of the A48.
- 8.8 At the extreme western end of the Scheme two small areas of ancient woodland are, at Pwll Diwaelod, located immediately adjacent to the existing motorway. Easements to enable minor works to existing culverts are required within these two ancient woodlands. A third area of ancient woodland approximately 1 ha in size within Berryhill Farm would however be lost to the Scheme.
- 8.9 Elsewhere habitats within the Scheme footprint include broadleaved plantation woodland within and to the north of the existing Castleton junction, and adjacent to the Duffryn Link south of Church Lane. Within Berryhill Farm semi-improved grassland is the dominant habitat.
- 8.10 The areas of woodland to the north of, and within the existing Castleton Junction planted as part of Welsh Government's M4 J29 to J32 widening scheme in the early 2000s provide habitat suitable for dormice. Survey results indicate the presence of dormice principally concentrated in three main areas; between Pwll Diwaelod and the existing eastbound on slip from M4 Junction 29a; either side of Pound Hill, and at the extreme eastern end of the proposed interchange.
- 8.11 Other protected and notable species present include bats, particularly to the south of the existing M4 and A48 where a number of bat roosts (including maternity roosts) have been confirmed close to, or within the Scheme footprint.
- 8.12 There are no designated heritage assets within the Castleton section and the section is outside of the Gwent Levels Landscape of

Outstanding Historic Importance. However, two areas (EXC001 and EXC002) on the north side of the interchange will require excavation prior to the commencement of major earthworks. Six areas (EVAL001 to EVAL006) will also require evaluation.

- 8.13 At the extreme western end of the Scheme there is a cluster of small sites with potential land contamination (CL-1 and CL-2) associated with the construction and/or widening of the existing M4. Two areas of potential land contamination are located to the north of the interchange at Pound Hill (CL-3) and Cefn Llogell Farm (CL-4).
- 8.14 To the south of the existing Castleton Junction there are two areas of potentially contaminated land through which the new section of motorway would pass. The first, the result of historic fly-tipping (CL-5) is located adjacent to Church Lane, whilst the second south east of Church Lane is along the southern edge of a large area associated with Radiator Manufacturers (CL-6). In total approximately 1.1 kilometres of the Castleton Interchange section would be constructed on potentially contaminated land.

Wentlooge Levels

- 8.15 The Wentlooge Levels section (Appendix A – Sheet 2) includes the area of Gwent Levels - St. Brides SSSI that would be crossed by the new section of motorway and extends from ch 5000 to ch 8440 on the west bank of the River Ebbw, a distance of approximately 3.44 kilometres. The Gwent Levels - St. Brides SSSI has an area of 1,312 hectares.
- 8.16 No land is required from any SINC's in this section and no properties require demolition in this section.
- 8.17 In common with the SSSIs on the Caldicot Levels the special features of the Gwent Levels - St. Brides SSSI through which the new section of motorway would pass are reed and ditch habitat; insects and other aquatic invertebrates; and shrill carder bee. Appendix A, Sheet 2

names five reens within the Gwent Levels – St Brides SSSI that would be crossed by the Scheme. From west to east these are the Nant y Moor Reen, the Percoed Reen, the Morfa Gronw Reen, the Pont y Cwch Reen and the Sea Wall Reen. Other watercourses are shown on the corresponding Highway Drainage and Reen Mitigation Plans (March 2016 ES Figure 2.5).

- 8.18 The other key habitat is predominantly semi-improved neutral grassland, some with hedgerows and the occasional area of deciduous woodland. Maerdy Farm to the south of the Scheme is an arable enterprise.
- 8.19 Protected and notable species present, other than those for which the SSSI is designated, include bats throughout the section with a number of bat roosts being confirmed close to the scheme footprint. Also throughout the section there are a number of watercourses that support water vole.
- 8.20 Within the Wentlooge Levels section there are no designated heritage assets other than the Gwent Levels Landscape of Outstanding Historic Interest within which the Scheme would be located. With regard to potential sub surface archaeology three areas would require excavation (EXC003 to EXC005) and eleven areas (EVAL007 to EVAL017) would require evaluation prior to construction.
- 8.21 Within the Wentlooge Levels section there are two small areas of potentially contaminated land in the area either side of the Duffryn Railway Bridge (CL-8 (a former railway bridge) and CL-9 (Green Lane Landfill)) and a very small area of made ground (CL-10) adjacent to Lighthouse Road overbridge.

Rivers Ebbw and Usk

- 8.22 The Rivers Ebbw and Usk section extends from the west bank of the River Ebbw (ch 8440) to the eastern end of the approach viaduct for the Usk Crossing at ch 11380 (Appendix A – Sheet 3), a distance of

2.94 kilometres. It also includes the Docks Way Link road and associated junctions that link the proposed new section of motorway to the A48 Southern Distributor Road, a distance of 1.2 kilometres. The new section of motorway would cross the River Usk SAC and the River Usk (Lower Usk) SSSI between ch 9955 and ch 10410, a distance of approximately 455 metres.

- 8.23 The Afon Ebbw River SINC and the Marshalls SINC would be crossed by the bridges over the Ebbw and Usk respectively.
- 8.24 The Afon Ebbw River SINC is a major river system with associated semi-improved neutral grassland and marshy grassland, swamp, scrub and semi-neutral woodland. Marshalls SINC comprises a mosaic of neutral grassland, post-industrial land and wetland.
- 8.25 The key habitats within the Rivers Ebbw and Usk section are the rivers themselves which are important for wintering birds and migratory fish (a primary reason for the designation of the Usk as a SAC and SSSI), saltmarsh (a feature of the River Usk (Lower Usk) SSSI) and areas of unimproved neutral grassland and dense scrub within Newport Docks. Reptiles and notable invertebrates have been recorded in undeveloped areas of the docks whilst signs of otter activity have been recorded on the east bank of the River Usk within the Scheme footprint. Otter is a qualifying feature for the River Usk SAC.
- 8.26 The Gwent Levels Landscape of Outstanding Historic Interest does not extend into the Rivers Ebbw and Usk section. In addition, there are no designated heritage assets within the Rivers Ebbw and Usk section, however there are fifteen buildings or structures of historic interest within Newport Docks. Most of these will require demolition. Demolition will also be required of a number of commercial buildings adjacent to the Docks Way Link road. The area identified for a storage lagoon and replacement saltmarsh on the east bank of the Usk, would require evaluation (EVAL018).

8.27 From the east bank of the River Ebbw to the eastern end of this section all the land crossed by the new section of motorway is potentially contaminated. On the west bank of the River Usk it includes Newport Docks (CL-14). On the east bank of the River Usk it includes part of the Stephenson Street Industrial Estate (CL-15), part of the Solutia Chemical Works (CL-17) including the PCB cell, part of the Mir Steel Works site (CL-20), and the mudflats and saltmarsh around the location of the east tower of the Usk Crossing (CL-18). The Docks Way Link Road would be built entirely on potentially contaminated land (CL-13 and CL-14). Excluding the channel of the River Usk approximately 4.1 kilometres of new road in the Rivers Usk and Ebbw section would be constructed on potentially contaminated land.

Caldicot Levels

8.28 The Caldicot Levels section extends for approximately 8.67 kilometres between ch 11380 and ch 20050 at the Llandeenny Railway Bridge (Appendix A – Sheets 4, 5 and 6). Three separate SSSIs would be crossed by the new section of motorway; the Gwent Levels - Nash and Goldcliff SSSI between ch 13000 and ch 14900 (1,900 metres) (Sheet 4), the Gwent Levels - Whitson SSSI between ch 14900 and ch 15100, and again between ch 16540 and ch 17220, (880 metres in total) (Sheet 5); and the Gwent Levels - Redwick and Llandeenny SSSI between ch 17220 and ch 20050 (2,830 metres) (Sheet 6), a total distance of 5,610 metres. The total area of the Gwent Levels - Nash and Goldcliff SSSI is approximately 761 hectares, whilst the total area of the Gwent Levels - Whitson SSSI is approximately 891 hectares and that of the Gwent Levels - Redwick and Llandeenny SSSI is 940 ha.

8.29 Appendix A, Sheets 4 to 6 name ten reens within the Caldicot Levels SSSIs that would be crossed by the Scheme. From west to east these are the Julian's Reen, Ellen's Reen, Blackwall reen, Monks Dirch, Steelworks Reen, Elver Pill Reen, New Cut Reen, Middle Road Reen and Cock Street Reen. Other watercourses are shown on the

corresponding Highway Drainage and Reen Mitigation Plans (March 2016 ES Figure 2.5).

- 8.30 Within the Caldicot Levels section between its western end and Pye Corner land would be required from the southern part of the Solutia SINC. The Solutia Site SINC is a series of improved and semi-improved grasslands with traditional ditches and ponds that support a range of species, including nesting birds such as Cetti's warbler and invertebrates.
- 8.31 Further eastward the majority of the Spencer Works 3 SINC, (comprising marshy grassland with wet drains), would be lost as a result of the Scheme together with small areas of the Bowkett Field Barecroft SINC, (comprising marshy grassland), Barecroft Fields SINC (semi-improved species poor wet pasture), and Land at Barecroft Common SINC (semi-improved damp grassland). The last three SINCS are located adjacent to each other at Barecroft Common.
- 8.32 One property within the section would require demolition. This is Barecroft House on Barecroft Common which is located at the eastern end of the Caldicot Levels section (Appendix A – Sheet 6) adjacent to Llandeenny Railway Bridge.
- 8.33 The special features of the three SSSIs of the Caldicot Levels through which the new section of motorway would pass are reen and ditch habitat; insects and other aquatic invertebrates; and shrill carder bee. All three SSSIs support rich assemblages of invertebrate species, including nationally rare and notable species. In addition they are also important for their botanical interest which includes a number of nationally rare plant species.
- 8.34 In addition to the special features of the SSSIs the predominant habitat in the area around Pye Corner, both within and without the Nash and Goldcliff SSSI and the area around Tatton Farm (Appendix A - Sheet 4) is predominantly semi-improved neutral grassland with hedgerows.

Protected and notable species present, other than those for which the SSSI is designated, include reptiles and bats. In addition, on the east side of Tatton Farm watercourses that cross, together with several watercourses adjacent to the Scheme footprint, support water vole.

- 8.35 Further eastward (Appendix A – Sheet 5) into the Whitson SSSI the grasslands become wetter and habitats are more diverse with extensive areas of continuous dense scrub both within and without the SSSI. Protected and notable species present, other than those for which the SSSI is designated, include reptiles, great crested newt locally and Cetti's warbler particularly in areas of dense scrub. Several watercourses support water vole.
- 8.36 The non-aquatic habitats within the Scheme footprint on the Redwick and Llandeenny SSSI (Appendix A – Sheet 6) are a mixture of improved, semi-improved neutral and marshy grassland some with species poor hedgerows with trees. Protected and notable species present, other than those for which the SSSI is designated, include great crested newt locally together with high densities of water vole.
- 8.37 There are no designated heritage structures within the footprint of the Scheme. For the most part the Scheme footprint is just outside the Gwent Levels Landscape of Outstanding Historic Interest, however between North Row (ch 17900) and Llandeenny Railway Bridge (ch 20500) the Scheme is within the registered landscape (Appendix A – Sheet 6)
- 8.38 There are no areas requiring archaeological excavation on the Caldicot Levels however there are areas requiring evaluation at regular intervals between Pye Corner and the Llandeenny Railway Bridge (EVAI019 to EVAL035).
- 8.39 On the Caldicot Levels areas of potentially contaminated land over or through which the new section of motorway would cross include area of the former Llanwern Research Laboratories (CL-22), the Llanwern

steelworks and lagoons (CL-26) and the Elver Pill and Green Moor landfill (CL-27). In total approximately 3.4 kilometres of the Caldicot Levels section would be constructed on potentially contaminated land.

Magor

- 8.40 The Magor section extends from the Llandeenny Railway Bridge (ch 20050) to Rockfield Lane, also known as The Elms (ch 22700) (Appendix A – Sheet 7). In this section the Scheme does not cross any SSSI, however land would be required from Upper Grange Farm Field SINC and Grange Road SINC. Both SINCs comprise species rich grassland.
- 8.41 Within the Magor section three properties would require demolition: Magor Vicarage adjacent to the B4245 Newport Road (see below), together with Dunline and Undy House both of which are located to the south of Knollbury.
- 8.42 Key habitats within the Magor section are improved and semi-improved grasslands with hedgerows (some important) and occasional small blocks of semi-natural deciduous woodland.
- 8.43 With regard to protected and notable species bat activity is characteristic of the western part of the section particularly between Llandeenny Railway Bridge and Newport Road. Confirmed bat roosts are located at Magor Vicarage and between Knollbury Lane and Rockfield Lane. Signs of otter activity have been recorded on St. Brides Brook (Mill Reen) whilst dormice have been recorded in low numbers to the north of the Scheme footprint between Knollbury Lane and Rockfield Lane.
- 8.44 Designated heritage assets within the footprint of the Magor section the Grade II listed Magor Vicarage (also known as Woodland House) adjacent to Newport Road. The section is outside of the Gwent Levels Landscape of Outstanding Historic Interest.

- 8.45 One area comprising settlement enclosures of late Iron Age and Roman date, between Llandeenny Railway Bridge and Newport, will require excavation (EXC007) and seven areas would be evaluated (EVAL035 to EVAL041) all prior to construction.
- 8.46 At Magor, immediately north of the Llandeenny Railway Bridge are two small areas of potentially contaminated land, the first some spoil heaps (CL-29); the second, a former refuse tip known as the Green Moor Quarry Landfill (CL-30). Two further areas of potentially contaminated land are located either side of Newport Road; the Wilcrick Highway Depot (CL-32) and a partially back filled quarry (CL-33). Part of the area of potentially contaminated land on which Magor Services is built (CL-35) is also included within the Scheme's permanent footprint. Toward the eastern end of the section there are two small areas of potentially contaminated land; the first located at ch 21800, which forms part of the Knollbury cesspits (CL-38), the second located at ch 22550 which is the partially backfilled Elms Road Old Quarry and lime kiln (CL-39).

Magor Interchange

- 8.47 The Magor Interchange section runs from Rockfield Lane (The Elms, ch 22700) to the eastern limit of the Scheme on the existing M4 at (ch 24000) (Appendix A – Sheet 8). In this section the Scheme does not cross any SSSI and no land is required from any SINCS in this section.
- 8.48 No properties require demolition within the Magor Interchange section.
- 8.49 Key habitats within the Magor Interchange section are predominantly fields of improved grassland with hedgerows, some of which are important. Adjacent to the proposed haul road to Ifton Quarry are several areas of semi-natural deciduous woodland and an area of ancient woodland (Roggiett Brake).
- 8.50 With regard to protected and notable species dormouse have been recorded in very low numbers both within the motorway planting at the

existing M4 J23 and to the north of the Scheme. There is also bat activity.

- 8.51 Designated heritage assets within the footprint of the Magor Interchange section include a scheduled standing stone known as the Devil's Quoit and the Llanfihangel Conservation Area. The section is outside of the Gwent Levels Landscape of Outstanding Historic Interest.
- 8.52 There are no excavation areas within the Magor Interchange section; however there are five evaluation areas (EVAL042 to EVAL 046) the majority being proposed borrow pits.
- 8.53 There is one area of potentially contaminated land within the Magor Interchange section at the extreme eastern end of the Scheme. This is former railway land referred to as the Severn Tunnel Railway Yard (CL-41).

Welsh Government's duties and obligations

- 8.54 In common with all public bodies Welsh Government has a statutory duty and obligation under Section 28G of the Wildlife and Countryside Act 1981 (as amended) (Document 3.1.7) "*...to take reasonable steps, consistent with the proper exercise of the authority's functions, to further the conservation and enhancement of the flora, fauna or geological or physiographical features by reason of which the site is of special scientific interest.*"
- 8.55 In addition public bodies, including Welsh Government, have a wider duty under Section 40(1) of the Natural Environment and Rural Communities Act 2006 (Document 3.1.13)
- "to have regard, so far as is consistent with the proper exercise of its functions, to the purpose of conserving biodiversity"*.

8.56 For public bodies in Wales the Natural Environment and Rural Communities Act 2006 has been updated by the Environment (Wales) Act 2016 (Document 3.1.16). Section 6(1) of that Act states that:

“A public authority must seek to maintain and enhance biodiversity in the exercise of functions in relation to Wales, and in so doing promote the resilience of ecosystems, so far as consistent with the proper exercise of those functions.”

8.57 Thus Welsh Government has a duty to seek and to take reasonable steps to maintain, conserve and enhance biodiversity, not just within the SSSIs of the Gwent Levels but throughout the Scheme footprint and areas affected by the Scheme.

9. Environmental Management during Construction

9.1 Chapter 18 of the ES describes how the environment would be managed during construction of the published scheme (referred to as Key Stage 6) through the further development and implementation of the scheme specific Construction Environmental Management Plan or CEMP. A Pre-CEMP or draft CEMP for the published scheme is appended to the Construction chapter of the ES (Document 2.3.2.) at Appendix 3.2.

Pre-CEMP and CEMP

9.2 The Pre-CEMP sets out the means by which the various construction activities would be managed to comply with the relevant environmental legislation and best practice to minimise effects on local residents and environmental receptors. Following the Public Local Inquiry, the Pre-CEMP would be developed into a full CEMP, which would be in place before construction begins. The CEMP would be incorporated as part of the Health, Safety and Environmental Management Plan (HASEMP) of the ECI contractor and would be managed as part of a bespoke Environmental Management System (EMS) during the construction period. Further details of the management and implementation of the HASEMP are set out by Mr Barry Woodman in his Proof of Evidence (**WG 1.6**).

9.3 The aims of the Pre-CEMP are as follows:

- a) Identify the extant minimum legislative requirements that need to be met;
- b) Identify other commitments which relate to the Scheme/activity;
- c) Set out procedures to monitor and manage environmental impacts;
- d) Set out emergency and contingency plans; and

- e) Identify the organisation which would be set up to manage environmental issues for the Scheme/activity, and co-ordination/management hierarchy for the delivery of the CEMP.

9.4 The purpose of the CEMP as set out in March 2016 ES paragraph 18.1.5 is to:

- a) Record environmental risks and identify how they would be managed during the construction period
- b) Provide a means of identifying environmental commitments, objectives and targets
- c) Provide a means of monitoring and reporting performance against the objectives and targets
- d) Provide a framework to ensure that all parties are aware of their responsibilities
- e) Establish a checklist of control procedures which must be integrated into the overall environmental management system for the scheme
- f) Describe how construction activities would be undertaken and managed in accordance with the obligations and requirements of environmental legislation, policy and environmental regulatory authorities and third parties
- g) Provide detailed Environmental Action Plans for reducing the potential for environmental impact during construction
- h) Define the activities that may require consents or licences
- i) Act as a link between the main document reference for environmental issues between the design, construction and maintenance stages

- j) Ensure the requirements of the Assessment of Implications on European Sites (AIES), the Environmental Statement and the Project Commitments Register are met.
- 9.5 Thus, the CEMP would ensure that environmental issues associated with the construction of the published scheme are appropriately identified, assessed, planned for and addressed in line with the requirements of the plan.
- 9.6 The scope of the CEMP covers all environmental impacts within the site boundary related to the construction of the published scheme. The plans and processes set out in the CEMP would be relevant to all contractors undertaking work on the Scheme.
- 9.7 As stated in the ES (at paragraph 18.1.4), the CEMP would be a ‘live’ document that would be developed throughout the duration of the Scheme. In parallel with the Commitments Register (which would be part of the CEMP) it would be updated to include how those commitments relevant to construction matters made in the Environmental Statement and any additional actions agreed during the statutory process, where relevant would be implemented. This process is ongoing and the updating of the Pre-CEMP is included in the December 2016 ES Supplement (Document 2.4.14).
- 9.8 Paragraph 18.6.1 of the ES sets out a high-level structure for the CEMP, which has now been adopted in the draft CEMP (March 2016 ES, Appendix 3.2). In the following paragraph in the ES (paragraph 18.6.2), it is stated that the CEMP would refer to a number of documents that would provide a framework for the construction and environmental management of the scheme. These documents include an Environmental Commitments Register, a register of ongoing environmental monitoring programmes, the Environmental Master Plans, method statements and of the following sub-plans each designed to cater for the specific requirements of individual environmental disciplines:

- a) Ground and Surface Water Management Plan (outline provided as Annex G of Pre-CEMP).
 - b) Site Waste Management Plan (outline provided as Annex F of PRE-CEMP).
 - c) Materials Management Plan (outline provided as Annex H of Pre-CEMP).
 - d) Construction Traffic Management Plan (see outline in Section 3.1 of Appendix 3.1 of the March 2016 ES).
 - e) Remediation Strategy (outline provided as Appendix 11.2 of the ES).
 - f) Dust Management Plan (yet to be developed).
 - g) Cultural Heritage Mitigation Plan (Appendix 8.10 of the March 2016 ES).
 - h) Sites of Special Scientific Interest Mitigation Strategy. (Appendix 10.35 of the March 2016 ES and Appendix SR10.35 of the December 2016 ESS).
 - i) Pollution Control and Prevention Plan (Annex E of Pre-CEMP).
 - j) Biosecurity Safe Systems of Work (Annex C of Pre-CEMP).
 - k) Invasive species (Annex D of Pre-CEMP).
 - l) Land Contamination Management Strategy (Appendix 11.3 of the ES).
 - m) Environmental Permitting Strategy (Appendix 11.5 of the ES).
 - n) Environmental, Landscape and Ecology Aftercare Plan (yet to be developed).
- 9.9 A draft Environmental Commitments Register (ES Appendix 18.1) and fully formed Environmental Master Plans for the published scheme (ES Figure 2.6) are set out in the ES. The other documents will be prepared, agreed with the relevant statutory organisation(s) and implemented, as required, during the detailed design and construction programmes.

Environmental Co-ordinator

9.10 The March 2016 ES (at section 18.5) sets out the roles and responsibilities of the Environmental Co-ordinator (ECO). It states that *“the ECO would have primary responsibility for managing environmental issues through construction and post-construction monitoring phases and for obtaining relevant licences and consents”*. The specific tasks would include the development and implementation of the CEMP and would include the following activities.

- a) To develop the CEMP document and systems and maintain it as a working document, undertaking reviews and updates where required.
- b) To ensure commitments made in the Environmental Commitments Register are included in the environmental management system, CEMP and detailed environmental design.
- c) Co-ordinating and attending necessary meetings and consultations relating to the environmental and sustainable construction aspects of the works.
- d) To provide monthly reports on site environmental monitoring.
- e) To ensure environmental quality standards are adhered to and to monitor compliance during the detailed design and construction phases of the proposed new section of motorway.
- f) To periodically provide review reports, including monitoring data where appropriate, to consultees. These reports would indicate compliance performance with the CEMP and would provide assurance that a high standard of environmental protection is being maintained, as well as identifying the implications of failure to meet standards of mitigation, the reasons for this and remedial actions to be taken.

9.11 In addition to the above, various activities associated with my current role as set out in paragraph 1.11 would continue; for example ensuring compliance with environmental legislation and guidance, liaising with

and providing the interface between the environment team and all other members of the project team, and co-ordinating environmental meetings. I would also continue to liaise closely with NRW and other bodies such as the Archaeological Curator appointed to the Scheme to ensure compliance with statutory requirements and the Commitments Register.

9.12 During construction however, my primary role would be to co-ordinate the environmental design, and manage the on-site environmental mitigation and monitoring works as set out in the CEMP.

9.13 Currently the ECO is a member of the ECI contractor's senior management team and will remain so during the construction period and throughout the 5 year ECI aftercare period. During construction compliance would be monitored by the environmental team under the direction of the ECO. The ECO and his environmental team would, in the unlikely event of the identification of non-compliance, have full authority to immediately stop any non-compliant activities, to suspend construction, or require prompt implementation of additional environmental mitigation measures as necessary. Should such a situation arise appropriate investigation would be undertaken and measures implemented to prevent any future occurrence.

Environmental Resources and Management during Construction

9.14 The March 2016 ES (at paragraph 18.5.3) identified the need for the ECO to be supported by a full-time Environmental Clerk of Works and by the ECI contractor's full-time Site Environmental Manager. The construction budget provides for an ECO, two Environmental Clerks of Works (ECoW) each assisted by two Assistant Environmental Clerks of Works (AECoW). At least one ECoW and at least two AECoWs would be ecologists by training. It is not anticipated that the above resources would be required full-time over the entire construction period, but they would be available full-time during the most environmentally sensitive periods, which are during the first eighteen months of the construction

period. At other times during the construction period appropriate environmental resources would be available as required.

- 9.15 In addition to the two ECoWs and four AECoWs specialist advice and supervision with respect to, for example, protected species (e.g. bats), archaeology, noise, water quality and land quality would be provided by the same experts that contributed to the ES and provided evidence at the Public Local Inquiry. These environmental resources would be in addition to the appointed environmental sub-contractors who would undertake, for example, vegetation clearance or archaeological evaluation.
- 9.16 Throughout the construction period the ELG would meet at regular intervals to review progress and to focus on specific environmental issues as required.

Environmental Resources and Management Post Construction

- 9.17 Following the opening of the Scheme it would be the ECI contractor's responsibility to maintain the soft estate, including all elements of the environmental design and mitigation for the first five years. During that period the ECO would continue to manage any environmental issues that may arise and would coordinate the environmental monitoring programme that would be in place at that time (see for example Commitments 130, 142, 145 and 160; Appendix SR18.1, Document 2.4.14). Appropriate environmental resources, including an ECoW and environmental specialists would be available as required. Regular meetings would be held with statutory consultees and other stakeholders to monitor progress and to discuss remedial actions required to address any issues that may arise. The ELG would continue to meet at regular intervals.
- 9.18 Following the 5 year aftercare period responsibility for the management and maintenance of the Scheme's soft estate including all elements of the environmental design and mitigation would revert to Welsh

Government. In common with other strategic highways that are the responsibility of the Welsh Government a specification for that ongoing management and maintenance would be produced at that time. It would however incorporate measures to address ongoing commitments made previously with respect to the Scheme.

10. Essential Mitigation

Introduction

- 10.1 As set out in paragraph 3.10 above I define essential mitigation as measures affecting and reducing the significance of adverse effects, i.e. those measures taken into account when assigning significance, and that can be provided under powers of the Highways Act 1980 (as amended). With regard to land required for essential mitigation, essential mitigation may be provided on land already acquired for highway engineering purposes (e.g. embankments) or on land outside of the highway boundary fence. Thus the general arrangements drawings and the environmental masterplan drawings within the ES Figures 2.4 and 2.6 respectively (Document 2.3.2; 2.4.4, Volume 2) show two fence lines, a highway boundary fence line and an essential mitigation boundary fence line.
- 10.2 The March 2016 ES (Document 2.3.2, Volume 1) describes in outline the mitigation measures that are part of the Scheme in chapter 2. It distinguishes between embedded mitigation and additional mitigation. Individual EIA assessment topic chapters (ES chapters 7 to 16) describe mitigation pertinent to each topic and this is expanded upon by my environmental colleagues in their respective proofs of evidence (Mr Michael Bull (WG 1.12.1); Mr Mick Rawlings (WG 1.9.1); Mr Nick Rowson (WG 1.8.1); Mr Keith Jones, (WG 1.18.1); Mr Jon Davies (WG 1.19.1); Mr Richard Green (WG 1.20.1); Mr Simon Zisman (WG 1.21.1); Mr Phil Evans (WG 1.14.1); Mr Andy Clifton (WG 1.11.1); Ms Julia Tindale (WG 1.10.1); and Mr Richard Graham (WG 1.15.1)). Unless stated otherwise all embedded and additional mitigation is mitigation that is committed to, and where it requires land that land has been included within the draft Orders.
- 10.3 Section 18.7 of the March 2016 ES (Document 2.3.2, Volume 1) explains that the key environmental mitigation measures incorporated within the design of the Scheme are illustrated on the Environmental

Masterplan drawings. These are included in the March 2016 ES as Figure 2.6 (Document 2.3.2, Volume 2) which comprises 16 separate sheets at a scale of 1:2500 (when printed at A1) covering the entire length of the proposed new section of motorway and the two interchanges at either end. Figure 2.6 was updated in the September 2016 issue of the ES Supplement (Document 2.4.4, Volume 2) as Figure R2.6, again comprising 16 sheets, which showed where amendments had been made by the use of 'bubble clouds'.

- 10.4 As explained in section 18.7 of the March 2016 ES (Document 2.3.2, Volume 1) all mitigation measures have been ascribed a purpose or Environmental 'Function' and an associated Landscape or Environmental 'Element'. The landscape and environmental design proposals forming the environmental mitigation for the proposed new section of motorway are fully described in chapter 9 of the March 2016 ES (Document 2.3.2 Volume 1).

Overall strategy

- 10.5 A primary task at preliminary design is to ensure that sufficient land is included in the draft Orders to accommodate all elements of the engineering, highway and environmental design and to ensure there is sufficient space to build the scheme. During the preliminary design the environmental team have worked closely with the design team, the contractor and statutory consultees to develop an overall mitigation strategy that is integral with the engineering design and is buildable, but which allows for further development and/or detailed refinements to be made at the detailed design stage.
- 10.6 The broader and most commonly required environmental functions shown on the Environmental Masterplan drawings are designed to provide mitigation in the form of visual screening, landscape integration, and replacement planting for purposes of biodiversity. These are not mutually exclusive and any one plot of land may be required to provide a number of functions and elements. The

assignment of environmental functions, landscape elements and environmental elements has been a collaborative effort by the environmental team, particularly Nick Rowson on landscape matters and Keith Jones on ecological matters. The overall environmental and landscape design strategy, within which mitigation is a key component, is described in chapters 2 and 9 of the March 2016 ES (Document 2.3.2 Volume 1) and is explained further in the landscape design section of Mr Nick Rowson's Proof of Evidence (WG 1.8.1). Below I summarise briefly in my own words the key components and differences of the environmental mitigation strategy across the Scheme.

- 10.7 At the Castleton Interchange at the western end of the Scheme essential mitigation land is required to provide replacement woodland planting for loss of deciduous woodland much of which is also dormouse habitat. Consequently over quite an extensive area there is a preponderance of deciduous tree planting, but not exclusively so. Parts of south facing slopes would be given over to species rich grassland to provide habitat for invertebrates. Locally the woodland planting would provide the additional function of visual screening. A similar approach to the Castleton Interchange has been adopted for the Magor Interchange where substantive blocks of woodland planting are proposed, primarily as replacement habitat but also for visual screening. Between the Llandevenny Railway Bridge and Magor Interchange woodland planting is proposed as a visual screen to the west of Magor and around WTA11b. The proposed mitigation on the embankments of the new dual carriageway between M4 J23 and M4 J23a and on the embankments of the existing M4 where modifications are required would comprise in the main open grassland with linear belts of shrubs and trees locally to provide a visual screen to close by dwellings.
- 10.8 On the Gwent Levels the nature of the mitigation planting is very different. Woodland is not a major characteristic of the Gwent Levels

although there are a few small woods. Consequently it is proposed to provide a few small blocks of woodland locally but in the main essential mitigation planting would comprise grassland; open grassland on the north facing embankments and species rich grassland on the south facing embankments of the new section of motorway. Where the motorway embankments are higher, for example on the approach to the Duffryn railway bridge the lower embankment slopes would be planted with linear belts of shrubs and trees. Elsewhere such planting is used to provide a visual screen for dwellings close to the proposed road. Where overbridges are required for side roads to cross the motorway a mixture of open grassland, shrubs and intermittent trees are proposed on the side road embankments. The exception is North Row overbridge where two blocks of woodland planting are proposed on the east side of the bridge.

- 10.9 Following the concerns and advice of NRW the mitigation design avoids tree planting that would overshadow either existing or replacement reens and field ditches. On the Caldicot Levels where small corners of fields would be left uneconomic to farm it is proposed to engineer them as marsh and wet grassland to maintain the historic field pattern and to provide biodiversity interest. The exception is at Tatton Farm which is in Welsh Government's ownership, where much larger land parcels would be managed as marsh and wet grassland.
- 10.10 In summary land take has been optimised and key environmental assets avoided wherever it has been practicable to do so. Mr Nick Rowson, in his Proof of Evidence (WG 1.8.1) demonstrates how the landscape character is reflected in the design of the published scheme. Mr Nick Rowson (WG 1.8.1), Mr Keith Jones (WG 1.18.1) and Mr Mick Rawlings (WG 1.9.1) respectively demonstrate in their proofs of evidence that the landscape, biodiversity and cultural heritage resources of the Gwent Levels have been respected. Ms Julia Tindale in her Proof of Evidence (WG 1.10.1) describes how the published

scheme would affect 'non-motorised users' or NMUs (e.g. pedestrians, walkers, cyclists and equestrians).

10.11 The land required for the published Scheme, as defined by the Compulsory Purchase Order, includes not only land needed for engineering purposes but also essential mitigation to fulfil the key aims of the environmental design. The key supporting documents in this regard are the set of Environmental Master Plans in the ES (Figures 2.6 and R2.6) (Document 2.3.2 and 2.4.4). These include all land required to build the Scheme.

Objections to land being used for essential mitigation

10.12 The following paragraphs explain the reasons for land required as essential mitigation between the highway boundary fence line and the essential mitigation boundary fence line which land owners have objected to.

Mr T G Hicks, Parc Golf Club (OBJ0049)

10.13 Plots 3/2b and 3/2j are required as essential mitigation for the provision of a replacement field ditch at the toe of the embankment, together with landscaping and planting. The latter is woodland planting both on the embankment and on level ground to the south of the replacement field ditch. This is required to replace woodland and dormouse habitat lost and to provide part of a continuous visual screen of this section of motorway between Castleton Interchange and the Gwent Levels. Plot 3/2c is also required for planting and landscaping, part of the extensive woodland and dormouse habitat replacement planting on the north side of the new section of motorway. Plot 3/2e is required for a replacement field ditch.

10.14 The essential mitigation land required from the Parc Golf Club is the subject of a proposed modification whereby the extent of plot 3/2b is reduced.

Cargo Services (UK) Ltd (OBJ0137)

10.15 Saltmarsh is a feature of the east bank of the River Usk and the River Ebbw (ES Figure 10.4; Document 2.3.2 Volume 2). Coastal saltmarsh is a BAP and NERC Section 42 habitat as well as a feature for which the River Usk (Lower Usk) SSSI was designated.

10.16 Plots 8/6a, 8/6b and 8/6h are required as essential mitigation for the creation of a new area of saltmarsh as mitigation for that permanently lost during the construction of the bridges over the River Ebbw and River Usk. Further details are provided in ES chapter 10 and in the Proof of Evidence of Mr Keith Jones (WG 1.18.1).

Mr J & P Watts Baker, Maerdy Farm (OBJ0145)

10.17 Plots 20/2 and 203 are required as land to provide essential mitigation for the loss of grazing marsh within the Gwent Levels SSSIs, particularly St. Brides SSSI, as described in the SSSI Mitigation Strategy (ES Appendix 10.35; Document 2.3.2 Volume 3 and Document 13.3.25), further details of which are provided by Mr Keith Jones (WG 1.18.1) in his Proof of Evidence.

Mrs Alfred, R P Richardson (Gwent) Ltd (OBJ0212)

10.18 Plot 5/9e corresponds to an area of essential mitigation required for the planting of deciduous woodland between the SWML railway line and the proposed new section of motorway on the north east side of the Duffryn railway bridge. This is required to integrate the scheme into the landscape, to provide replacement woodland and to screen part of WTA5.

Mr JS and Mrs RE Anstey, Court Farm (OBJ0213)

10.19 Plots 17/5a, 17/5b, 17/5c, 17/5d, 17/5e, 17/5f, 17/5h, 17/5t, 17/5y, 17/5ak are required as essential mitigation for landscaping and planting. Plot 17/5j is required for the construction and maintenance of a drainage channel and environmental fencing.

- 10.20 Plot 23/3 is required for essential mitigation for the loss of grazing marsh within the Gwent Levels SSSIs, as described in the SSSI Mitigation Strategy (ES Appendix 10.35; Document 2.3.2 Volume 3 and Document 13.3.25), further details of which are provided by Mr Keith Jones in his Proof of Evidence (WG 1.18.1).
- 10.21 Plot 17/5a contains a highway drainage run. It was originally to be grassed throughout but at the request of the Monmouthshire County Council (MCC) the proposed planting regime has been changed where possible to linear belt(s) of trees and shrubs (see ESS paragraph 5.1.1. and Figure R2.6 Sheet 14; Document 2.4.4 Volume 1 and 2 respectively). Plots 17/5b, 17/5c, 17/5d, 17/5e, 17/5f and 17/5h together comprise a proposed area of deciduous woodland planting, the primary purpose of which is to replace existing woodland planting lost to the Scheme and to provide a visual screen of some elements of the proposed Magor Interchange for the proposed Rockfield Farm housing development (see MCC LDP allocation SAH5, ES Figure 17.2d, ES Table 17.12; Document 2.3.2 Volumes 2 and 1 respectively).
- 10.22 Plots 17/5t, 17/5y and 17/5ak together provide screening vegetation of the roundabout element of the Magor Interchange for the residents of the Llanfihangel Conservation Area.

Miss S G Anstey, Old Court Farm (OBJ0214)

- 10.23 Plot 22/3 is required as essential mitigation for the loss of grazing marsh within the Gwent Levels SSSIs, as described in the SSSI Mitigation Strategy (ES Appendix 10.35; Document 2.3.2 Volume 3 and Document 13.3.25), further details of which are provided by Mr Keith Jones in his Proof of Evidence (WG 1.18.1). Plot 23/7 is no longer required for the same purpose subject to the agreement of NRW.

Mr D Colley, Great House Farm (OBJ0215)

- 10.24 Plots 17/6a and 17/6b are required as essential mitigation to provide an area of deciduous woodland planting to offset losses elsewhere within

the Scheme footprint and to provide a visual screen of the proposed Magor Interchange.

10.25 Plot 22/2 is required as essential mitigation for the loss of grazing marsh within the Gwent Levels SSSIs, as described in the SSSI Mitigation Strategy (ES Appendix 10.35; Document 2.3.2 Volume 3 and Document 13.3.25), further details of which are provided by Mr Keith Jones in his Proof of Evidence (WG 1.18.1).

Mr Derek David, Fair Orchard Farm (OBJ0216)

10.26 Plots 6/4f, 6/4m, and 6/4bw are required for essential mitigation to help integrate Lighthouse Road overbridge into the landscape. The mitigation would take the form of shrubs with intermittent trees which would also provide a screen of the overbridge from views to the north and northwest. The remaining essential mitigation plots, plots 6/4aa, 6/4ac, 6/4aj, 6/4am, 6/4at and 6/4bh are required for a number of reed / field ditch replacements.

Mr W.T German, Arch Farm (OBJ0218)

10.27 Plot 10/5a is required as essential mitigation for the provision of landscaping and planting, specifically for shrubs and intermittent trees to improve the setting of the modified junction between Nash Road and Meadows Road at Pye Corner.

Executors of DG Harris (OBJ0219)

10.28 Plots 15/11a, 15/11d, 15/11f, 15/11g and 15/11h are required as essential mitigation for the provision of landscaping and planting to the west of Magor between the Llandevenny railway bridge and B4245 Newport Road (see also cross section 18, ES Figure 2.7; Document 2.3.2 Volume 2). The landscaping would be in the form of one or more linear belts of shrubs and trees to delineate the separation between the proposed new section of motorway and the existing A4810. Plot 15/11b is for woodland planting on the east side of the same section of

motorway along the top of the cutting. This would be a continuation of the woodland planting on the cutting slope and is required to provide additional screening of high sided vehicles.

Mr M D W Hazell, Cefn Hallen Farm (OBJ0220)

10.29 Plots 13/5r and 13/5h are required as essential mitigation to provide landscape integration by enabling part of an unclassified public highway near North Row to be grassed once it is broken out.

Mr D H James, North Court Farm (OBJ0223)

10.30 Plot 15/3a is required as essential mitigation to enable the continuation of the visual screen of a linear belt of shrubs and trees on the north side of the new section of motorway immediately to the west the existing position of Bareland Street.

Trustees of F H James Partnership, Penterry Farm (OBJ0224)

10.31 Plots 14/2a and 14/2m are to provide an area of marsh and wet grassland to the south of the proposed new section of motorway and Rush Wall together with a replacement ditch alongside Rush Wall bordered by a linear belt of trees and shrubs. This essential mitigation is designed to benefit biodiversity, to provide landscape integration and to maintain the historic field pattern in this area, as well as, via the linear belt of trees and shrubs, providing a visual screen.

10.32 The essential mitigation land required on the north side of the proposed new section of motorway between it and the A4810 Queensway is for the provision of open grassland and a replacement field ditch (Plot 14/2b) and where there is more width linear belts of trees and shrubs and a replacement field ditch (Plot 14/2k). These are designed to provide an element of landscape integration and a visual screen respectively.

10.33 Plots 14/2a, 14/2b, 14/2k and 14/2m are also required for essential mitigation for ree/field ditch replacement to the south of the A4810 Queensway opposite the Europark.

Mr R M Jenkins, Red House Farm (OBJ0225)

10.34 Plot 15/8a, located immediately to the north of the proposed Bareland Street underbridge is required for essential mitigation for landscaping and planting to provide visual screening by means of a linear belt of trees and shrubs (see cross-section 17, ES Figure 2.7; 2.3.2; Document 2.3.2 Volume 2). This is a continuation of the visual screen being provided on the motorway embankment at this location which is in the same ownership. Plot 15/8b, located on the east side of the proposed motorway to the south of Bareland Street is required for essential mitigation for biodiversity in the form of species rich grassland alongside a replacement ree/field ditch.

Mr C W Jones, Barnetts Cottage (OBJ0226)

10.35 Plots 23/4 and 23/4a were originally required for the enhancement of the land on Caldicot Moor to Site of Special Scientific Interest (SSSI) quality as part of the SSSI Mitigation Strategy. Following further discussions with NRW, and subject to their written confirmation, these plots are no longer required.

Messrs R Jones, G Jones, K Jones M Jones and R Jones, New Park Farm (OBJ0227)

10.36 Plot 1/3c is for woodland planting and is required as essential mitigation for two reasons. First to provide a visual screen of the motorway for New Park Farm and second to provide a continuation of an east-west wildlife corridor along the top of the motorway embankment. Plot 1/3p is in part a continuation of plot 1/3c but also encompasses a large area of essential mitigation land required to provide replacement woodland and dormouse habitat that would be lost to the Scheme as a necessary consequence of remodelling the

Castleton junction to form the new interchange. That part of plot 1/3p closest to the new interchange would also provide a visual screen to New Park Farm. Plots 2/2a and 2/2c are an eastward continuation of plot 1/3p and are required for the same reason of habitat replacement.

Modification

10.37 A modification of the draft Orders in respect of plot 1/3c has been proposed whereby the westward limit of the woodland habitat replacement would not encroach as much on New Park Farm. This modification requires the reduction in woodland planting to be made up elsewhere on land in the Jones family's ownership and it is proposed that the southern part of plot 2/2j is used for that purpose.

Miss Laura Neville, Cefn Llogel Fach (OBJ0230)

10.38 Plot 2/16c is required as essential mitigation to provide 4.39ha of deciduous woodland to replace both the woodland in its own right but also to provide future dormouse habitat.

Mr N Park, Pembroke House Miss A S Park, Miss S R Park Miss V L Park and Mr A B T Park, White House Farm, Pembroke House Farm (OBJ0231)

10.39 Plot 22/4 is required for essential mitigation for the loss of grazing marsh within the Gwent Levels SSSIs, as described in the SSSI Mitigation Strategy (ES Appendix 10.35; Document 2.3.2 Volume 3 and Document 13.3.25), further details of which are provided by Mr Keith Jones in his Proof of Evidence (WG 1.18.1).

Mr Stephen Philips, Elder Cottage (OBJ0233)

10.40 Plots 15/18a and 15/21a are required for the provision of a woodland landscaping planting strip on east side of part of the proposed cutting for the new section of motorway to west of Magor and along the south side of the B4245 Newport Road.

10.41 Plots 22/5 and 23/5 are required for essential mitigation for the loss of grazing marsh within the Gwent Levels SSSIs, as described in the SSSI Mitigation Strategy (ES Appendix 10.35; Document 2.3.2 Volume 3 and Document 13.3.25), further details of which are provided by Mr Keith Jones in his Proof of Evidence (WG 1.18.1).

Mr Llewellyn Pritchard, The Beeches (OBJ0235)

10.42 Plot 16/7a is required as essential mitigation to provide landscape integration and for the provision of a linear belt of shrubs and trees to screen part of the proposed new section of dual carriageway between M4 J23 and M4 J23a immediately to the west of the Beeches Caravan Park on the north side of the Scheme.

Mr William Reece, Highfield Farm (OBJ0236)

10.43 Plots 15/9a, 15/9m, 15/9p, 15/9r and 15/9t are required as essential mitigation to provide for replacement reens and / or field ditches.

Mr Alan Williams, Hendrew Farm (OBJ0240)

10.44 Plots 14/4a and 14/4b are located between North Row and Bareland Street on the north side of the proposed new section of motorway between it and the A4810 Queensway. Similarly plots 14/4c and 14/4f are located in the same general area to the south of the new section of motorway between it and Rush Wall. All plots are required to create marshy and/or wet grassland and are the remnants of a much larger land holding the remainder of which is required for the construction of the new motorway.

Liberty Steel Newport Ltd (OBJ0308)

10.45 Saltmarsh is a feature of the east bank of the River Usk and the River Ebbw (ES Figure 10.4; Document 2.3.2 Volume 2). Coastal saltmarsh is a BAP and NERC Section 42 habitat as well as a feature for which the River Usk (Lower Usk) SSSI was designated.

10.46 Plots 8/9a, 8/9b and 8/9c are required as essential mitigation for the creation of a new area of saltmarsh as mitigation for that permanently lost during the construction of the bridges over the River Ebbw and River Usk. Similarly plots 8/9e and 8/9g are required for the creation of marshy grassland. Further details are provided in ES chapter 10 and in the Proof of Evidence of Mr Keith Jones (WG 1.18.1).

Technoplan Anstalt (OBJ0317)

10.47 Plots 9/3b and 9/3c are required for essential mitigation. Plot 9/3b located on the south side of the proposed new section of motorway to the west of Nash Road would be planted with linear belts of shrubs and trees, both to provide a visual screen but also to provide a setting for the realigned Wales Coast Path at this location.

10.48 Plot 9/3c is required to provide for a replacement reed / field ditch, details of which are provided by Mr Mike Vaughan in his Proof of Evidence (WG 1.17)

Mr Mark Williams, Mr Mark Skinner, Mr Clive Coulthard, Hollywood Farm (OBJ0322)

10.49 Plot 1/4j is required as essential mitigation for woodland planting to provide landscape integration and to replace woodland lost locally to the Scheme. It is also required for a temporary construction compound and storage area (ESS Figure 2.4 Sheet 1; Document 2.4.4 Volume 2) during the construction of the new Castleton Interchange. As evidenced by Ms Julia Tindale (WG 1.10.1) as a consequence of its construction use the quality of the land is likely to be compromised such that if restored to agricultural use its quality would be reduced.

11. Enjoyment Of Property

Overview

- 11.1 This section provides an overview of how the enjoyment and amenity of resident's dwellings would be affected during construction and operation of the proposed new section of motorway. This is based on information contained within the ES, both the March 2016 ES and the two supplements published in September and December 2016 (Document 2.3.2, 2.4.4 and 2.4.14).
- 11.2 I recognise that enjoyment of a property is subjective and people will experience the enjoyment of their property in different ways. I acknowledge that there may be other factors affecting the enjoyment of a particular property that I am not aware of. My opinion is based purely on the information contained within the ES. I also acknowledge that the DMRB does not include specifically an assessment of enjoyment and amenity of residential property. For example, chapter 2 of DMRB 11.3.7 (HD 213/11) talks about nuisance and effects upon health and general quality of life but then thereafter, it just talks about impacts. There is no mention of enjoyment or amenity. Below I describe in my own words how I consider the enjoyment of property may change as a result of the scheme being progressed by reference to changes in noise, air quality effects and visual effects during construction and operation.
- 11.3 With respect to noise I refer to the March 2016 ES Figure 13.11, the September 2016 ESS Figures R13.14 & R13.15 together with Appendices 13.3 and R13.4. Figure 13.11 sets out the daytime construction noise impact bands with mitigation in place whilst Appendix 13.3 sets out the methodology used to determine Figure 13.11.
- 11.4 Figure R13.14 shows the noise difference contours between the Do Minimum scenario for the Opening Year (2022) and the Do Something scenario (i.e. with the scheme including mitigation in place) for the

Opening Year. Figure R13.15 shows the noise difference contours between the Do Minimum scenario for the Opening Year (2022) and the Do Something scenario (i.e. with the scheme including mitigation in place) for the Design Year (2037). Appendix R13.4 sets out the methodology used to produce the noise contour maps together with the noise data for the more than twenty thousand noise sensitive receptors assessed and depicted graphically in Figures R13.14 and R13.15.

- 11.5 With respect to air quality I refer to the March 2016 ES Figures 7.12c and 7.12f. Figures 7.12c and 7.12f show the change in annual mean nitrogen dioxide (NO₂) concentrations (in µg/m³) as result of the scheme, and the annual mean particulate (PM₁₀) concentrations (in µg/m³) as result of the scheme respectively.
- 11.6 With respect to visual impact I make reference to sections 9.7 and 9.8 of the March 2016 ES. Sections 9.7 and 9.8 are part of the Landscape and Visual Effects chapter and describe the assessment of potential construction and operational effects respectively.
- 11.7 As a guide, the environmental assessment does not consider potential noise effects more than 1 km away from the limits of the scheme (March 2016 ES paragraph 13.3.27), whereas the corresponding limit for air quality effects is 350 metres for dust generated during construction (March 2016 ES paragraph 7.3.10) and 200 metres for vehicular emissions (March 2016 ES paragraph 7.3.12). There are no set limits for visual impact.

Objectors to CPO

- 11.8 The following paragraphs set out my interpretation of the information contained within the ES (Document 2.3.2, 2.4.4 and 2.4.14) that describes how the enjoyment of an existing property, or in the case of Bovis Homes Ltd future properties, would change as a result of the construction and operation of the new section of motorway to the south of Newport. The text below is confined to those land owners that have

objected to the compulsory purchase of their land and have also raised the issue of loss of enjoyment of their property.

Bovis Homes (OBJ0103)

11.9 In Welsh Government's response, dated 7th July 2016, to Bovis Homes' objection the following points were made in respect of the specific environmental impact on their site.

4.1 The potential cumulative environmental effects of the allocated development sites are considered in Chapter 17 of the ES. Your client's site is identified in Figure 17.2 and Table 17.11 under development area SAH6.

4.2 The locations of the noise barriers are shown on the Environmental Master Plans Figure 2.6 of the ES.

4.3 Details of construction are given in points 2.2 and 2.3 of this letter (of 7th July). The new trunk road will be in a cutting to the north of the M4 Motorway. The Scheme proposes strict controls on construction dust.

11.10 I would however note that the reference to Table 17.11 above is incorrect; it should be Table 17.12 (Document 2.3.2 Volume 1) which briefly describes the potential likely significant effects on the site mainly during the construction period. During operation there would be no significant adverse impact on SAH6 as a result of M4CaN primarily because approximately half of the traffic on the existing M4 directly to the north of the site would transfer to the proposed dual carriageway between M4 J23 and J23a which is further away. Indeed, as a consequence noise and air quality regimes on the Bovis' site would improve as is shown by September 2015 ESS Figures R13.14 and R13.15 for noise (Document 2.4.4 Volume 2) and March 2016 ES Figures 7.12c(III) and 7.12f(III) for air quality (Document 2.3.2 Volume 2).

Mr Nicholas Clarke, Whitcross Farm (OBJ0207)

11.11 Whitecross Farm is located on the west side of Lighthouse Road immediately south of the road bridge over the South Wales Main Line (SWML) railway line. It is therefore adjacent to the SWML railway line and would be more than 200m north of the proposed new section of motorway. The residents of Whitehouse Farm have objected to the Scheme with concerns, inter alia, about the enjoyment of the property during and post construction, including impact due to noise, dust, air quality, and light pollution. Matt Jones, Welsh Government's Project Engineer responded in writing to the residents of Whitecross Farm on 7th July 2016 enclosing a sketch plan of the property and the proposed new section of motorway and the Lighthouse Road overbridge and a visualisation of the same. To that correspondence I would add the following.

11.12 Currently the main source of noise at the property is traffic on Lighthouse Road. As a consequence the predicted change in noise at the property in 2022 with and without the proposed new section of motorway in place would be about +1 dB (September 2016 ESS Appendix R13.4; Document 2.4.4 Volume 3). This is because currently there is a relatively high noise level of 60 to 65 dB (expressed in decibels, dB LA10) at the property from traffic on Lighthouse Road compared to the baseline noise level of 50 to 55 dB (September 2016 ESS Figure R13.3; Document 2.4.4 Volume 2).

11.13 During construction, Whitecross Farm is predicted to experience a minor adverse impact with respect to construction noise with mitigation measures in place (March 2016 ES Appendix 13.3 and March 2016 ES Figure 13.11c; Document 2.3.2 Volumes 3 and 2 respectively). This means that the predicted noise from construction activities would be audible with a noise level of 60 to 65 dB which is higher than the baseline ambient noise level and of the same magnitude as current traffic noise level on Lighthouse Road.

- 11.14 Whitecross Farm is also within the construction dust assessment study area which is defined by a 350 metre buffer around any construction works. However, at a distance of more than 200 metres the sensitivity of dust soiling effects on people and property is considered to be low and with dust mitigation measures in place the risk of dust impacting on Whitecross Farm is considered to be low (ES Table 7.14; Document 2.3.2 Volume 1).
- 11.15 Views to the south-east and south from the property are currently screened by tall hedgerows alongside Lighthouse Road. Views to the south-west are more open such that there would be views across a single field bordered by a hedgerow with trees to WTA5 beyond and the proposed new section of motorway on a low (~2 metres) embankment beyond that. Neither the motorway nor Lighthouse Road overbridge would be lit; the nearest section to be lit would be that to the east of the New Dairy Farm overbridge on the approach to the River Usk Crossing over the River Ebbw. Nevertheless, the EIA predicts that, during construction Whitecross Farm would experience a very large temporary adverse significance of effect in terms of visual impact due to the proximity of construction activities (March 2016 ES paragraph 9.7.173; Document 2.3.2 Volume 1). During operation the significance of the visual impact is predicted to be large due to the proximity of the new section motorway and the new Lighthouse Road overbridge (March 2016 ES paragraph 9.8.256; Document 2.3.2 Volume 1). Further details of the Landscape and visual assessment undertaken for the ES are provided in Mr Nick Rowson's Proof of Evidence (WG 1.8.1).
- 11.16 The proposed planting on the embankments of the proposed motorway and the Lighthouse Road overbridge are for open grassland and shrubs with intermittent trees respectively (March 2016 ES Figure 2.6 Sheet 4; Document 2.3.2). There is however a 2 metre high noise barrier proposed along the north side of the Scheme that runs from the Duffryn railway bridge to the New Dairy Farm overbridge. Despite this

barrier it is predicted that the environs of Whitecross Farm away from the influence of traffic on Lighthouse Road would experience a 1 to 3 dB increase in noise as a result of traffic on the new section of motorway (see September 2016 ESS Figures R13.14 and R13.15; Document 2.4.4 Volume 2). Further details are provided by Mr Phil Evans (WG 1.14.1).

Mr Derek David, Fair Orchard Farm (OBJ0216)

11.17 Fair Orchard Farm is located on the east side of Lighthouse Road immediately south of where that road would cross the proposed new section of motorway. The property would therefore be approximately 80m south of the nearest carriageway of proposed new section of motorway. Lighthouse Road would be slightly further away but on a rising embankment toward the proposed Lighthouse Road overbridge. The owner of Fair Orchard Farm has objected to the Scheme with concerns, inter alia, about the enjoyment of the property during and post construction. Matt Jones, Welsh Government's Project Engineer responded in writing on 3rd August 2016 enclosing various details and a visualisation. To that correspondence I would add the following.

11.18 Currently the main source of noise at the property is traffic on Lighthouse Road. As a consequence the predicted change in noise (expressed in decibels, dB L_{A10}) at the property in 2022 with and without the proposed new section of motorway and the Lighthouse Road overbridge in place would be about +3 to +4 dB (September 2016 ESS Appendix R13.4; Document 2.4.4 Volume 3). This is because currently there is a relatively high noise level of 60 to 65 dB at the property from traffic on Lighthouse Road compared to the baseline noise level of 45 to 50 dB (September 2016 ESS Figure R13.3; Document 2.4.4 Volume 2).

11.19 During construction Fair Orchard Farm is predicted to experience a moderate adverse impact with respect to construction noise with mitigation measures in place (March 2016 ES Appendix 13.3 and

March 2016 ES Figure 13.11c; Document 2.3.2 Volumes 3 and 2 respectively). This means that the predicted noise from construction activities would be audible at a noise level of 65 to 75 dB which is substantially higher than the baseline ambient at the property (including the contribution from traffic on Lighthouse Road).

11.20 Fair Orchard Farm is also within the construction dust assessment study area which is defined by a 350 metre buffer around any construction works. At a distance of some 80 metres where there is only one receptor the sensitivity of dust soiling effects on people and property is considered to be low (March 2016 ES Table 7.7; Document 2.3.2 Volume 1) and with dust mitigation measures in place the risk of dust impacting on Fair Orchard Farm is considered to be low (March 2016 ES Table 7.14; Document 2.3.2 Volume 1).

11.21 Views from Fair Orchard Farmhouse are to the west over Lighthouse Road across open fields or to the east from the back of the property again over open fields to the River Ebbw and the River Usk. With the Scheme in place there would be oblique views of the proposed new section of motorway on a low (~2 metres) embankment in the middle distance. However in the foreground of the view from the front of the property would be the realigned Lighthouse Road on a rising embankment. Neither this section of the motorway nor Lighthouse Road overbridge would be lit; the nearest section to be lit would be that to the east of the New Dairy Farm overbridge on the approach to the River Usk Crossing over the River Ebbw. Nevertheless that would be visible from the farmhouse.

11.22 The EIA predicts that, during construction Fair Orchard Farm would experience a very large temporary adverse significance of effect in terms of visual impact due to the proximity of major construction activity and significant earthworks associated with the new section motorway and the new Lighthouse Road overbridge (March 2016 ES paragraphs 9.7.88, 9.7.126, 9.7.173 and Viewpoint 22, (Document 2.3.2 Volume 3)). During operation the significance of the visual impact is predicted

to remain very large due to the presence of the Scheme including moving traffic and highway lighting in the distance (March 2016 ES paragraphs 9.8.112, 9.8.115, 9.8.177, 9.8.180, 9.8.256, 9.8.259 Document 2.3.2 Volume 1 and Viewpoint 22; Document 2.3.2, Volume 2). Further details of the Landscape and visual assessment undertaken for the ES are provided in Mr Nick Rowson's Proof of Evidence (WG 1.8.1).

11.23 The proposed planting on the embankments of the proposed motorway and the Lighthouse Road overbridge are for predominantly open grassland and shrubs with intermittent trees respectively, although a number of hedgerows are also proposed on the south sides (see March 2016 ES Figure 2.6 Sheet 4; Document 2.3.2). There is a 2 metre high noise barrier along the north side of the proposed motorway that runs from the Duffryn railway bridge to the New Dairy Farm overbridge. This however will not benefit Fair Orchard Farm. Thus it is predicted that Fair Orchard Farm farmhouse would experience a 3 to 6 dB increase in noise, but surrounding areas associated with the farmhouse would experience higher noise levels as a result of traffic on the new section of motorway (see September 2016 ESS Figures R13.14 and R13.15; Document 2.4.4 Volume 2). Further details are provided by Mr Phil Evans (WG 1.14.1).

Mr R M Jenkins, Red House Farm (OBJ0225)

11.24 Red House Farm is located within the small village of Llandevenny approximately 340 metres west from the nearest section of carriageway of the proposed new section of motorway. The owner of Red House Farm has objected to the Scheme with concerns, inter alia, about the enjoyment of the property during and post construction. Matt Jones, Welsh Government's Project Engineer responded in writing on 28th July 2016 enclosing various details. To that correspondence I would add the following.

- 11.25 Currently the main source of noise at Red House Farm in Llandeenny is from road traffic on the A4810 Queensway, some 290 metres distant. The A4810 is closer to the property than the proposed new section of motorway. Existing baseline noise (expressed in decibels, dB L_{A10}) levels at the property are in the mid-to high forties (September 2016 ESS Figure R13.3; Document 2.4.4 Volume 2) with the levels in 2022 predicted to be approximately 46 dB at the ground floor and 49 dB at the first floor.
- 11.26 Despite the distance involved and the screening effect of adjacent buildings to the east and south, the predicted change in noise at the property in 2022 with and without the proposed new section of motorway but with no mitigation in place would be about +7 dB (September 2016 ESS Appendix R13.4; Document 2.4.4 Volume 3). This is because of the significant increase in the amount of noise generating traffic the new section of motorway and the future A4810 would carry compared to the existing A4810. However, with the proposed low noise road surface mitigation in place on the new section of motorway it is predicted that traffic noise levels at the property in 2022 would be 51 to 53 dB, some 4 to 5 dB greater than would be experienced without the Scheme in place. This represents a noticeable increase in traffic noise, but at levels that are relatively low. Further details can be provided by Mr Phil Evans (WG 1.14.1).
- 11.27 During construction, Red House Farm is predicted to experience no significant adverse impact with respect to noise with or without mitigation measures in place (March 2016 ES Appendix 13.3 and March 2016 ES Figure 13.11h; Document 2.3.2 Volumes 3 and 2 respectively).
- 11.28 Red House Farm is also just within the construction dust assessment study area which is defined by a 350 metre buffer around any construction works. At that distance where there is a group of receptors the sensitivity of dust soiling effects on people and property is considered to be low (March 2016 ES Table 7.7; Document 2.3.2

Volume 1) and with dust mitigation measures in place the risk of dust impacting on Red House Farm is also considered to be low (ES Table 7.14; Document 2.3.2 Volume 1).

11.29 Views from Red House Farm to the east, south east and south towards the proposed new section of motorway are restricted due to the presence of adjacent dwellings and farm buildings. Further afield to the east, the west side of the A4810 is bordered by an intermittent belt of trees. To the south vegetation along Bareland Street also screens the A4810. As seen from Red House Farm the new section of motorway would be beyond the A4810. The new section of motorway would not be lit in this vicinity.

11.30 The visual impact assessment reported in the ES does not specifically assess Red House Farm. The nearest assessed receptor to it is Manor Farm (Receptor 112) which is located immediately to the north of the property. From a visual impact point of view the two locations are similar; Manor Farm is screened by adjacent vegetation, Red House Farm is screened by adjacent buildings. The EIA predicts that, during construction, Manor Farm/Red House Farm would experience a slight adverse impact (March 2016 ES paragraph 9.7.193 (Receptor 112) (Document 2.3.2 Volume 1). During operation, the significance of the visual impact is predicted to remain slight adverse in the opening year and 15 years later as “existing intervening vegetation would limit the extent and impact of these views” (March 2016 ES paragraphs 9.8.286 and 9.8.288; Document 2.3.2 Volume 1). Further details of the Landscape and visual assessment undertaken for the ES are provided in Mr Nick Rowson’s Proof of Evidence (WG 1.8.1).

Messrs R Jones, G Jones, K Jones M Jones and R Jones, New Park Farm (OBJ0227)

11.31 New Park Farm is located approximately 70m to the north of, and above the existing M4 at the western end of the existing Castleton junction (M4 J29). It is currently screened from the motorway by a

mature belt of deciduous woodland planting. The owners of New Park Farm have objected to the Scheme with concerns, inter alia, about the enjoyment of the property during and post construction. Matt Jones, Welsh Government's Project Engineer responded in writing on 7th September 2016 enclosing various details. I have met various members of the Jones' family at the public information exhibitions, the draft Orders exhibition and at New Park Farm. I would therefore add to Matt Jones' correspondence the following.

- 11.32 Currently the main source of noise at New Park Farm immediately to the north of M4 J29 is from traffic on the existing M4. The proposed Scheme would bring the nearest carriageway (the eastbound off slip to the existing M4) to approximately 50 metres away from the property, whilst the top of the nearest cutting slope would be approximately 25 metres away.
- 11.33 Existing baseline noise (expressed in decibels, dB L_{A10}) levels at the property are in the high sixties to seventy (September 2016 ESS Figure R13.3; Document 2.4.4 Volume 2) with the levels in 2022 predicted to be approximately 68 dB at the ground floor and 71 dB at the first floor.
- 11.34 The noise modelling reported in the ES predicts that there a slight increase of about 1.0 dB in noise levels at the property in 2022 with the proposed new section of motorway including the low noise surface mitigation in place (September 2016 ESS Appendix R13.4; Document 2.4.4 Volume 3). This is because, although the property is relatively close to the existing M4 and would be slightly closer to eastbound off (to existing M4) slip road the majority of the traffic noise would come from the same locations as from the existing M4. The change in noise level would be on the margins of audibility. Further details are provided by Mr Phil Evans (WG 1.14.1).
- 11.35 New Park Farm is predicted to experience a major adverse impact with respect to noise during construction of Castleton Interchange and associated works with mitigation measures in place (March 2016 ES

Appendix 13.3 and March 2016 ES Figure 13.11a; Document 2.3.2 Volumes 3 and 2 respectively). This means that the predicted noise from construction activities would be audible at a loudness of 65 to >75 dB which would be for the most part be slightly higher than the current baseline ambient at the property, but on occasion could be noticeably higher, for example during the placement of soil stockpiles in the field adjacent to the property.

11.36 New Park Farm is also within construction dust assessment study area which is defined by a 350 metre buffer around any construction works. At a distance of 25 to 50 metres where there is a single receptor the sensitivity of dust soiling effects on people and property is considered to be low (March 2016 ES Table 7.7; Document 2.3.2 Volume 1) and with dust mitigation measures in place the risk of dust impacting on New Park Farm is also considered to be low (March 2016 ES Table 7.14; Document 2.3.2 Volume 1).

11.37 Views from New Park Farm to the south towards the proposed new section of motorway are restricted due to the presence of mature screening vegetation adjacent to the property. Currently the existing M4 J29 Castleton Junction is lit. The proposed Castleton Interchange would also be lit. Planting on the new cutting slopes of the proposed motorway immediately to the south of New Park would comprise woodland planting on the middle and upper slopes and species rich grassland on the lower slopes (March 2016 ES Figure 2.6 Sheet 1; Document 2.3.2 Volume 2).

11.38 The EIA predicts that, during construction New Park Farm would experience a large temporary adverse significance of effect in terms of visual impact due to the removal of existing motorway planting, the proximity of major construction activity and significant cuttings (including the development of a borrow pit immediately to the east) associated with the new section motorway (March 2016 ES paragraph 9.7.153 (Receptor 19) (Document 2.3.2 Volume 1)). During operation the significance of the visual impact is predicted to remain large in the

opening year but reduce to slight 15 years later as the proposed motorway planting matures (March 2016 ES paragraphs 9.8.220 and 9.8.222; Document 2.3.2 Volume 1). Further details of the Landscape and visual assessment undertaken for the ES are provided in Mr Nick Rowson's Proof of Evidence (WG 1.8.1).

Monitoring

11.39 A further concern of the Jones family is whether there would be any environmental monitoring should the Scheme proceed. In response to that concern I would point out that in the Register of Environmental Commitments (September 2016 ESS Appendix R18.1; Document 2.4.4 **Volume 3**) there are various commitments to undertake environmental monitoring including the development and implementation of a general environmental monitoring strategy (Commitment 102). More specifically Commitment 80 states that "*Noise monitoring (and vibration monitoring where appropriate) would be carried out as appropriate at or around residential properties during the construction phase*" and Commitment 30 states that "*measures to minimise impacts from dust and air quality nuisance would be developed into a Dust Management Plan (DMP), which would be implemented throughout the duration of the construction works*". I can confirm that New Park Farm would feature in those monitoring commitments.

Mr John and Mrs Joan Major, Langley Villa (OBJ0229)

11.40 Langley Villa is located on the east side of St. Bride's Road in Magor and would be approximately 80 metres south from the nearest section of carriageway of the proposed new section of motorway. However, between the house and the carriageway (in the current paddock) would be an area of reedbed (part of WTA 11b) surrounded by open grassland and a 5m high motorway embankment which would be landscaped with linear belts of shrubs and trees. The highway boundary would therefore be at the side of the property.

- 11.41 The owners of Langley Villa have objected to the Scheme with concerns, inter alia, about the enjoyment of the property during and post construction. Matt Jones, Welsh Government's Project Engineer responded in writing on 11th July 2016 enclosing various details including a visualisation. To that correspondence I would add the following.
- 11.42 Currently the main source of noise at Langley Villa is from road traffic on the existing M4, the nearest carriageway of which is located approximately 95 metres to the north of the property. As a consequence the predicted change in noise (expressed in decibels, dB L_{A10}) at the property in 2022 with and without the proposed new section of motorway but with no mitigation in place would be about -1 dB (September 2016 ESS Appendix R13.4; Document 2.4.4 Volume 3). This is because both the relatively high baseline noise level of 67 to 68 dB at the property and the current baseline noise level of 65 to 70 dB (September 2016 ESS Figure R13.3; Document 2.4.4 Volume 2) are dominated by traffic noise. Approximately half of the motorway traffic would be further away from the property with the Scheme in place. However, with the proposed mitigation in place, (low noise surface and 2m high noise barrier on the south side of the new section of motorway opposite Langley Villa), it is predicted that traffic noise levels at the property would decrease to 61 to 62 dB, some 6 to 7 dB less than currently experienced. This represents a significant reduction in traffic noise.
- 11.43 During construction Langley Villa is predicted to experience a major adverse impact with respect to noise during construction of the adjacent WTA with mitigation measures in place (March 2016 ES Appendix 13.3 and March 2016 ES Figure 13.11i; Document 2.3.2 Volumes **3** and **2** respectively) but a moderate adverse impact during the earthworks phase and construction of the motorway itself. This means that the predicted noise from construction activities would be audible at a loudness of 65 to >75 dB which would be higher than the

current baseline ambient at the property (including the contribution from traffic on St Brides Road).

- 11.44 Langley Villa is also within the construction dust assessment study area which is defined by a 350 metre buffer around any construction works. At a distance of some 80 metres where there is a group of receptors the sensitivity of dust soiling effects on people and property is considered to be medium (March 2016 ES Table 7.7; Document 2.3.2 Volume 1), however with dust mitigation measures in place (see March 2016 ES Section 7.9: Document 2.3.2 Volume 1) the risk of dust effects would be reduced to negligible levels.
- 11.45 Existing views from Langley Villa are to the north over a paddock to the embankment of the existing M4. Established planting on the existing motorway embankment consists of linear belts of mature trees. With the Scheme in place that planting would be removed, a new embankment would have been constructed up to approximately 25 metres closer to the property, and that new embankment would be planted with linear belts of shrubs and trees (see September 2016 ESS Figure R2.6 Sheet 13; Document 2.4.4 Volume 2 and cross section 20, March 2016 ES Figure 2.7; Document 2.3.2 Volume 2). As currently the section of motorway opposite Langley Villa would not be lit.
- 11.46 The EIA predicts that, during construction, Langley Villa would experience a large temporary adverse significance of effect in terms of visual impact due to the proximity of major construction activity and significant earthworks associated with the new section motorway and the reed bed for WTA 11b (March 2016 ES paragraph 9.7.200 (Receptor 94); Document 2.3.2 Volume 1). During operation the significance of the visual impact is predicted to remain large in the opening year and 15 years later due to the presence of the Scheme including moving traffic (March 2016 ES paragraphs 9.8.296 and 9.8.299; Document 2.3.2 Volume 1). Further details of the Landscape and visual assessment undertaken for the ES are provided in Mr Nick Rowson's Proof of Evidence (WG 1.8.1).

Miss Laura Neville, Cefn Llogel Fach (OBJ0230)

- 11.47 Cefn Llogel Fach is located on higher ground in Cefn Llogell approximately 300 metres from the existing motorway to the north east of the existing J29 Castleton Junction. The nearest works associated with the Scheme would be the development of a potential borrow pit and woodland planting as essential mitigation (see paragraph 3.10 above) at a slightly greater distance from the property.
- 11.48 The owner of Cefn Llogel Fach has objected to the Scheme with concerns, inter alia, about the enjoyment of the property during and post construction. Matt Jones, Welsh Government's Project Engineer responded in writing on 7th July 2016 enclosing various details. To that correspondence I would add the following.
- 11.49 Currently the main source of noise at Cefn Llogel Fach is from road traffic on the existing M4, the nearest carriageway of which is located approximately 300 metres to the north of the property. Baseline noise levels (expressed in decibels, dB L_{A10}) are about 60 dB. As a consequence of the distance involved the predicted change in noise at the property in 2022 with and without the proposed new section of motorway but with no mitigation in place would be minimal, about 0 dB (September 2016 ESS Appendix R13.4; Document 2.4.4 Volume 3). With the proposed low noise surface on the new sections of motorway in place it is predicted that traffic noise levels at the property would decrease by approximately 1 dB which is on the margin of audibility. Further details can be provided by Mr Phil Evans (WG 1.14.1).
- 11.50 During construction Cefn Llogel Fach is predicted to experience no adverse impact with respect to noise with or without mitigation measures in place (March 2016 ES Appendix 13.3 and ES Figure 13.11b; Document 2.3.2 Volumes 3 and 2 respectively).
- 11.51 Cefn Llogel Fach is within the construction dust assessment study area which is defined by a 350 metre buffer around any construction works.

At a distance of some 300 metres where there is a single receptor the sensitivity of dust soiling effects on people and property is considered to be low (March 2016 ES Table 7.7; Document 2.3.2 Volume 1) and with dust mitigation measures in place (see March 2016 ES Section 7.9: Document 2.3.2 Volume 1) the risk of dust impacting on Cefn Llogel Fach is considered to be negligible.

- 11.52 Existing views from Cefn Llogel Fach to the existing M4 are to the south over open farmland with mature hedgerows and blocks of woodland. Established planting on the existing motorway embankment consists of linear belts of mature trees. With the Scheme none of that vegetation would be removed, indeed a large area of woodland planting is proposed on the north east side of the new Castleton Interchange (see September 2016 ESS Figure R2.6 Sheet 2; Document 2.4.4 Volume 2 and cross section 20, March 2016 ES Figure 2.7; Document 2.3.2 Volume 2). The effects of lighting of the proposed Castleton Interchange would be very similar to the existing M4 junction at Castleton.
- 11.53 With respect to potential visual impact Cefn Llogel Fach has not been considered by the EIA as it is sufficiently far away from the proposed works at the Castleton Interchange, and in particular the existing M4 would be between it and the scheme not to be affected.

Miss Christine Philips, Green Farm (OBJ0232)

- 11.54 The dwelling at Green Farm is a Grade II listed farmhouse located on the south side of the existing B4245 on the north side of Llanfihangel. The farmhouse is approximately 90 metres south of the existing M48 and would be some 50 metres from the embankment required for the construction of the Windmill Hill overbridge. In addition the property would be some 120 metres from the proposed small roundabout on the B4245 and 280 metres from the large gyratory on the proposed Magor Interchange.

- 11.55 The owner of Green Farm has objected to the Scheme with concerns, inter alia, about the enjoyment of the property during and post construction. Matt Jones, Welsh Government's Project Engineer responded in writing on 28th July 2016 enclosing various details. To that correspondence I would add the following.
- 11.56 Currently the main source of noise at Green Farm is from road traffic on the M48 and B4245 to the north and, to a lesser extent, the existing M4 to the south and west. The minimum distances to those roads from the farmhouse at Green Farm are approximately 95 metres, 15 metres and >500 metres respectively. The minimum distances to the property of the nearest elements of the Scheme would be the embankments for the Windmill Hill overbridge (approximately 55 metres), the small roundabout on the B4245 (approximately 80 metres), and the large gyratory at the proposed Magor Interchange (approximately 180 metres) (see September 2016 ESS Figure R2.4 Sheet 14: Document 2.4.4 Volume 2).
- 11.57 The predicted change in noise (expressed in decibels, dB L_{A10}) at the property in 2022 with and without the proposed Magor Interchange but with no mitigation in place would be about +1.6 dB (September 2016 ESS Appendix R13.4; Document 2.4.4 Volume 3). This is because the current background noise level of 60 to 65 dB (September 2016 ESS Figure R13.3; Document 2.4.4 Volume 2) and that at the property (approximately 63 dB in 2022) are dominated by road traffic from the M48 and B4245. With the proposed low noise surface mitigation in place on the Magor Interchange it is predicted that traffic noise levels would at the property would remain very similar at approximately 64 dB. This indicates that the M4 is, and the proposed Magor Interchange would, not contribute significantly to the traffic noise at Green Farm. Further details can be provided by Mr Phil Evans (WG 1.14.1).
- 11.58 During construction with mitigation measures in place Green Farm is predicted to experience a major adverse impact with respect to noise during construction of the adjacent Windmill Hill overbridge and a

moderate adverse impact in respect of the small roundabout on the B4245 (March 2016 ES Appendix 13.3 and March 2016 ES Figure 13.11j; Document 2.3.2 Volumes 3 and 2 respectively). This means that the predicted noise from construction activities would be audible at a loudness of 65 to >75 dB which would be substantially higher than the current background at the property.

- 11.59 Green Farm farmhouse is also within the construction dust assessment study area which is defined by a 350 metre buffer around any construction works. At a distance of some 15 metres where there is a single receptor the sensitivity of dust soiling effects on people and property is considered to be medium (March 2016 ES Table 7.7; Document 2.3.2 Volume 1), however with mitigation measures in place (see March 2016 ES Section 7.9: Document 2.3.2 Volume 1) the risk of dust effects would be reduced to negligible levels.
- 11.60 The visual impact assessment reported in the ES does not specifically assess Green Farm. Green Farm would have clear and uninterrupted views of the Scheme to the north toward the Windmill Hill overbridge and embankment and have a restricted view to the south west toward the Magor Interchange. The nearest assessed receptor to it is Green Farm Cottages (Receptor 145c) which is a similar distance from the proposed Windmill Hill overbridge, approximately 60 metres to the toe of the overbridge embankment and 80 metres to the side road.
- 11.61 During construction Green Farm would experience a large temporary adverse significance of effect in terms of visual impact due to the construction of the Windmill Hill overbridge and elements of the Magor Interchange. During operation the significance of the visual impact would remain large in the opening year and reduce further to moderate 15 years later as the proposed Scheme planting matures. Details of the effect of the Scheme on Green Farm as a listed building are set out at paragraph 5.5.9 and 5.5.10 of the September 2016 ES Supplement (Document 2.4.4 Volume 1).

Mr Stephen Philips, Elder Cottage (OBJ0233)

11.62 The owner of Elder Cottage has objected to the Scheme with concerns, inter alia, about the enjoyment of the property during and post construction. Matt Jones, Welsh Government's Project Engineer responded in writing on 19th September 2016 enclosing various details.

11.63 It is not clear from the correspondence whether Mr Philips' concerns about the potential loss of enjoyment of the property relates to Green Farm (see response to OBJ0232 above) or to Elder Cottage. The post code at Elder Cottage is NP26 3AX which is located in Common-y-coed, more than 1 kilometre north of the existing M4 due north of Knollbury between M4 J23 and M4 J23a.

11.64 If it is Elder Cottage then the nearest element during the construction and operation of the new dual carriageway would be between M4 J23 and M4 J23a on the north side of the existing motorway. This would be more than 1 kilometre away. Consequently, given that distance of the property from the Scheme I consider it to be too far away from the proposed development for the enjoyment of the property to be significantly affected.

11.65 If it is Green Farm then my comments in relation to the enjoyment of that property during the construction and operation of the Scheme are pertinent (see paragraphs 11.54 to 11.61 above).

Mr William Reece, Highfield Farm (OBJ0236)

11.66 The post code of Highfield Farm is NP26 3BJ. This is located in Llanvaches near Caerwent off the A48 some 3.5 kilometres to the north of the existing M4 and the proposed Scheme, due north of Knollbury.

11.67 The owner of Highfield Farm has objected to the Scheme with concerns, inter alia, about the enjoyment of the property during and post construction. Matt Jones, Welsh Government's Project Engineer responded in writing on 7th July 2016 enclosing various details. Given

the distance of the property from the Scheme I consider it to be too far away from the proposed development for the enjoyment of the property to be significantly affected.

Mr Lyndon Williams, Upper Grange Farm (OBJ0241)

11.68 Upper Grange Farm is located more than 600 metres to the north of the existing M4 between J23 and J23a, north east of the Magor Services and north west of Knollbury.

11.69 The owner of Upper Grange Farm has objected to the Scheme with concerns, inter alia, about the enjoyment of the property during and post construction. Matt Jones, Welsh Government's Project Engineer responded in writing on 7th July 2016 enclosing various details including a visualisation. Given the distance of the property from the Scheme I consider it to be too far away from the proposed development for the enjoyment of the property to be significantly affected.

12. Conclusion

- 12.1 The M4CaN involves the construction and operation of a 24 kilometre length of new three lane motorway, together with two short link roads, associated side roads and two major motorway interchanges. The Welsh Government's preferred route as set out in The Plan which was published in July 2014 (Document 4.5.7) is to the south of Newport. Unavoidably such a route necessitates crossing the Gwent Levels SSSIs to some degree or other.
- 12.2 Extensive environmental surveys were undertaken in 2014, 2015 and 2016 to understand the environmental baseline and to inform the engineering and environmental design of the Scheme. These surveys are summarised in Volume 1 of the ES (Document 2.3.2) and are reported in full in the accompanying appendices to the ES (Volume 3). A thorough and comprehensive environmental impact assessment of the Scheme has been undertaken in accordance with the current EIA Regulations, official guidance in the form of the DMRB and best practice. In my opinion, the EIA process and ES fully comply with relevant legislation, and the Welsh Government's official guidance on environmental assessment. No statutory regulatory organisation has commented adversely on the process by which the EIA was undertaken.
- 12.3 A Statement to Inform an Appropriate Assessment (SIAA) (**Document 2.3.4**) has been undertaken in accordance with legislation and official guidance. This concluded that the M4CaN would not have an adverse effect on the integrity of the River Usk SAC, Severn Estuary SAC, SPA and Ramsar and the Wye Valley and Forest of Dean Bat Sites SAC, either alone or in combination with other projects and plans. Following the provision of further information on the SIAA requested by NRW I believe that there is now no disagreement between NRW and the environment team with respect to the SIAA.

- 12.4 In my opinion therefore, for the purposes of Regulation 61 on the Conservation of Habitats and Species Regulations 2010 (Document 3.1.22), the SIAA together with the subsequent survey reporting demonstrates that, beyond reasonable scientific doubt there would be no adverse effect on the integrity of the European Sites considered in the Habitats Regulations Assessment.
- 12.5 Under the Environment (Wales) Act 2016 and Section 28G of the Wildlife and Countryside Act 1981 (as amended) Welsh Government has a duty to seek and to take reasonable steps to maintain, conserve and enhance biodiversity, not just within the SSSIs of the Gwent Levels but throughout the Scheme footprint and areas affected by the Scheme. Whilst biodiversity is the key environmental asset affected by the Scheme there are many others which are accommodated in the Scheme design. These are described and assessed in the ES and appropriate mitigation measures are incorporated into the Scheme design.
- 12.6 Building on the work undertaken during the EIA and the preliminary design a draft or Pre-CEMP has been developed and published as part of the ES. The Pre-CEMP includes an Environmental Commitments Register, a register of ongoing environmental monitoring programmes, the Environmental Master Plans, method statements and of the following sub-plans each designed to cater for the specific requirements of individual environmental disciplines. It will continue to be developed and agreed with statutory consultees prior to construction.
- 12.7 The Environmental Commitments Register is important because its commitments are in lieu of planning conditions and are regarded by the Welsh Government as binding. Together with the Commitments Register, prior to construction a management system will be in place, overseen by the environmental co-ordinator, to ensure that sufficient appropriate resources are available throughout the construction period. Those resources will ensure that the environment subjected to

construction activities will be proactively protected through careful planning and execution of the works.

- 12.8 The overall mitigation strategy has been to optimise and minimise land take and avoid key environmental assets wherever it has been practicable to do so. Mitigation measures requiring land are primarily for visual screening, landscape integration, and replacement planting for purposes of biodiversity. In my opinion the level and form of the mitigation measures incorporated into the Scheme at the preliminary design stage are appropriate and proportionate.