A303 Amesbury to Berwick Down

Secretary of State letter 20 June 2022

Applicant's response to the request for comments
Q2 - Conclusion on alternative routes
Outline Heritage Impact Assessment – Bored Tunnel Extension

Document reference: Re-determination 4.3

Planning Act 2008

The Infrastructure Planning (Examination Procedure) Rules 2010

July 2022

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Foreword

The A303 Amesbury to Berwick Down scheme ("the Scheme") forms part of a package of proposals for the A303/A358 corridor, improving this vital connection between the South West and London and the South East and including the upgrade of remaining single carriageway sections on the route to dual carriageway. This investment is stated as a priority project in the National Infrastructure Plan and Government's commitment is confirmed in the Road Investment Strategy (2020-2025).

Objectives for the Scheme have been formulated both to address identified problems and to take advantage of the opportunities that new infrastructure would provide. The objectives are defined by the Department for Transport ("DfT"): Client Scheme Requirements.

- **Transport** - To create a high quality reliable route between the South East and the South West that meets the future needs of traffic;
- **Economic Growth** - To enable growth in jobs and housing by providing a free flowing and reliable connection between the South East and the South West;
- **Cultural Heritage** - To help conserve and enhance the World Heritage Site and to make it easier to reach and explore; and
- **Environment and Community** - To improve biodiversity and provide a positive legacy for nearby communities.

The objectives would be achieved by providing a high quality, two-lane dual carriageway on the A303 trunk road between Amesbury and Berwick Down in Wiltshire.

The Scheme would resolve traffic problems and, at the same time, protect and enhance the WHS. Key components comprise:

a) A bypass to the north of Winterbourne Stoke with a viaduct over the River Till valley;
b) A new junction between the A303 and A360 to the west of and outside the World Heritage Site, replacing the existing Longbarrow roundabout;
c) A twin-bore tunnel approximately 3km in length past Stonehenge;
d) A new flyover at Countess roundabout.

Executive Summary

This Outline Heritage Impact Assessment ('Outline HIA') follows ICOMOS Guidance (ICOMOS 2011) for heritage impact assessment for World Heritage Sites. It has been prepared to inform the Secretary of State for Transport's redetermination of National Highways' Application for a Development Consent Order (DCO) for the A303 Amesbury to Berwick Down Scheme.

The Outline HIA assesses the likely impacts of one outline engineering design scenario on the Outstanding Universal Value (OUV) of the Stonehenge, Avebury and Associated Sites World Heritage Site (WHS). This alternative to the DCO Scheme comprises a **Bored Tunnel Extension** with a tunnel portal at chainage 6+150, c.80m west of the western boundary of the WHS. The bored tunnel length would be c.4,250m with c.85m of cut and cover to the eastern portal; the total tunnel length would be c.4,335m.

This Outline HIA identifies the likely effects on heritage assets and asset groups that contribute to the Attributes that convey the OUV, the Integrity and the Authenticity of the WHS. It considers the overall impact and likely effect of the Bored Tunnel Extension alternative on the OUV of the WHS as a whole. It also compares the impacts and effects of the DCO Scheme with that of the Bored Tunnel Extension alternative on the OUV of the WHS.

In summary, the likely overall effects on the OUV of the WHS as a whole are assessed as:

- **Existing A303** – Large adverse
- **DCO Scheme** – Slight beneficial
- **The Bored Tunnel Extension** – Moderate beneficial

Heritage Impact Assessment summary data

World Heritage Property: Stonehenge, Avebury and Associated Sites Geographical coordinates: N51 10 44 W1 49 31

Date of Inscription: 1986

Minor boundary modification inscribed year: 2008

Date of the Outline HIA report: 11 July 2022

Name of the organisation or entities responsible for preparing the HIA report: AmW (AECOM, Mace, WSP) on behalf of National Highways

Prepared for: National Highways

External assessment and peer review:

No external peer review has been undertaken due to the required timescales for submission to the Secretary of State for Transport.

1 Introduction

1.1 Project background

1.1.1 In 2014, the UK Government Department for Transport (DfT) announced its intention to improve the A303 trunk road through the Stonehenge part of the Stonehenge, Avebury and Associated Sites World Heritage Site (WHS No. C373) in Wiltshire, England, UK.

1.1.2 In October 2018, Highways England submitted a Development Consent Order (DCO) Application, accompanied by an Environmental Statement (ES) (Highways England 2018a) and Heritage Impact Assessment (HIA) (hereafter, 'the Main HIA'; Highways England 2018b).

1.1.3 The DCO Application was subject to public examination in 2019. On 2 January 2020, the Planning Inspectorate recommended that the Secretary of State should withhold consent, warning that the proposed Scheme would cause "permanent irreversible harm" and the benefits to the 'outstanding universal value' (OUV) "would not be capable of offsetting this harm" (Planning Inspectorate, 2020, para. 5.7.321).

1.1.4 Following an archaeological find at Durrington, in the north-east of the WHS, the Secretary of State for Transport decided to defer his decision about the DCO application. In July 2020, an Addendum to the Main HIA was prepared addressing the 'new discovery' (Highways England 2020a). The Secretary of State for Transport ('the Secretary of State') granted development consent on 12 November 2020, deciding that "any harm to heritage assets, including the OUV [outstanding universal value], is less than substantial and this harm (while carrying great weight), along with the other harms identified, are outweighed by the benefits of the development".

1.1.5 In July 2021, a legal challenge against the decision to grant consent for the A303 Amesbury to Berwick Down scheme past Stonehenge was upheld in the High Court and consequently the DCO granted by the Secretary of State was quashed. One of the two grounds of challenge upheld was that the Secretary of State was legally obliged to consider the merits of alternatives to the proposed western cutting, referring specifically to the provision of a cut-and-cover section to the west of the proposed bored tunnel, or an extension of that bored tunnel to the west so that its portal would be located outside the World Heritage Site (Ground 5(iii); [2021] EWHC 2161).

1.1.6 This Outline Heritage Impact Assessment (Outline HIA) has been prepared by AmW (AECOM, Mace, WSP) on behalf of National Highways (formerly known as Highways England) to assess the effect of a theoretical alternative

to the DCO Scheme, comprising a Bored Tunnel Extension with a tunnel portal outside the WHS at chainage 6+150, c.80m west of the western boundary of the WHS. The bored tunnel length would be c.4,250m with c.85m of cut and cover to the eastern portal; the total tunnel length would be c.4,335m, compared to a total tunnel length of 3,285m proposed under the DCO Scheme.

1.1.7 This Bored Tunnel Extension alternative has been developed to a preliminary design stage only. This preliminary design does not include drainage or landscape mitigation information. For this reason, this Outline HIA is undertaken as a theoretical exercise in order to provide sufficient information on which the Secretary of State for Transport can make their decision.

1.2 Purpose of this Heritage Impact Assessment

1.2.1 The purpose of this Outline HIA is to assess the potential negative and positive impacts of the Bored Tunnel Extension alternative on the OUV of the WHS, in accordance with ICOMOS Guidance on Heritage Impact Assessments for Cultural World Heritage Properties (ICOMOS 2011). This Outline HIA addresses both designated and non-designated heritage assets relevant to the OUV of the WHS. It deals only with impacts on OUV, Integrity and Authenticity and does not examine impacts on other designated or non-designated heritage assets that do not contribute to OUV as defined in the Statement of Outstanding Universal Value (SoOUV) (UNESCO 2013, 291–94).

1.2.2 Further information on methodology, baseline, and the national, local and WHS-specific planning and policy context is contained in the ES (Highways England 2018a) and the Main HIA for the DCO Scheme (Highways England 2018b). The Main HIA also contains a full glossary of terms and abbreviations.

1.3 Previous Heritage Impact Assessment documents related to the DCO Scheme

1.3.1 A number of other HIA documents related to the DCO Scheme have been previously produced and comprise high level HIAs prepared between 2016 and 2017, a HIA Scoping Report in 2018, and HIAs prepared by third parties (for details, see Highways England 2018b, Section 3.3).

1.3.2 The Main HIA was prepared by AmW on behalf of National Highways to support the DCO Application for the Scheme (Highways England 2018b). This was prepared in tandem with the development of the DCO Scheme design, to inform the road improvement proposals as an integral part of the

iterative design process. It formed Appendix 6.1 to the Environmental Statement, part of a suite of application documents which accompanied the DCO submission.

1.3.3 An additional submission was made in 2020 at the request of the Secretary of State, comprising a HIA Addendum to consider the implications of the Durrington Walls discovery and pit-like geophysical anomalies identified elsewhere in the WHS and within the DCO boundary (Highways England 2020a).

1.4 Joint UNESCO World Heritage Centre/ICOMOS Advisory Missions and World Heritage Committee decisions

1.4.1 A series of Joint UNESCO WHC/ICOMOS Advisory Missions have been invited by the State Party to advise during development of the DCO Scheme. These Advisory Missions took place in 2015, 2017 and 2018, and presented Reports to the World Heritage Committee (WHC). Details of the Advisory Mission Reports and the subsequent WHC Decisions are provided in Section 3.5 of the Main HIA (Highways England 2018b) and in Section 1.2 of the Statement of Matters, Applicant's Response to Bullet Point Five – Any Other Matters (National Highways 2022a [Redetermination Document 1.5]).

1.4.2 A further Joint UNESCO WHC/ICOMOS/ICCROM Advisory Mission took place in April 2022. This reviewed the UK's progress on:

a) resolving issues of upgrading the A303 road while also addressing its impact on the Stonehenge landscape; and

b) addressing Decision 44COM 7B.61 of the World Heritage Committee, which reiterated the concern identified in the 2018 Advisory Mission Report that portions of the proposed A303 improvement scheme (particularly at the western end) would "*impact adversely the Outstanding Universal Value (OUV) of the property, especially affecting its integrity*" and considers that "*the scheme should be modified to deliver the best available outcome for the OUV of the property*".

1.4.3 Publication of the 2022 Advisory Mission Report to the World Heritage Committee with the Mission's recommendations is awaited.

2 Planning and Policy Context

2.1.1 This Outline HIA has been prepared in accordance with international, national and local planning documents. Further details are set out in the Main HIA (Highways England 2018b) and Main HIA Annex 1, Heritage and tourism planning and policy context. These are not repeated here, as there have been no substantive changes (National Highways 2022b [Redetermination Document 1.4], section 3.1).

2.1.2 The Stonehenge, Avebury and Associated Sites WHS Management Plan policies form the framework for the protection of the WHS and its OUV (Simmonds & Thomas, 2015) (Main HIA, paragraph 4.1.5). A review of the current WHS Management Plan 2015-2021 ('the 2015 Management Plan') is underway, with a new management plan anticipated to be in place by April 2023. In the meantime, the 2015 Management Plan and associated documents remain as reviewed for the ES (Highways England 2018a) and Main HIA (Highways England 2018b).

3 Methodology

3.1 Overview

3.1.1 This Outline HIA is intended to inform the Secretary of State on the likely impacts of the Bored Tunnel Extension alternative on the Outstanding Universal Value (OUV) of the Stonehenge, Avebury and Associated Sites World Heritage Site (WHS).

3.1.2 The Outline HIA assesses the effects of the Bored Tunnel Extension alternative on Asset Groups and individual heritage assets expressing Attributes of OUV; upon the Attributes of OUV, as described in the Statement of OUV; upon Integrity and Authenticity; and upon the OUV of the WHS as a whole.

3.2 Data sources and field surveys

3.2.1 This Outline HIA has been prepared in line with the Guidance on Heritage Impact Assessments for Cultural World Heritage Properties adopted by the International Council on Monuments and Sites in January 2011 (ICOMOS 2011) and makes use of the data sources (WHS core documentation, published works, unpublished reports, online database resources, field surveys and associated technical studies) as set out in Sections 5.2 and 5.3 of the Main HIA (Highways England 2018b) and updated in National Highways 2022b [Redetermination Document 1.4], section 3.3; and in National Highways 2022c [Redetermination Document 2.1], Archaeological Gazetteer.

3.2.2 The Zone of Theoretical Visibility (ZTV) used in Figures 4, 6 and 8 of this Outline HIA is a bare earth digital terrain model.

3.2.3 Figure 9 of this Outline HIA illustrates the location of Asset Groups in relation to existing tranquillity across the study area as mapped by the Campaign to Protect Rural England (CPRE) in 2007. This demonstrates that the tranquillity rating across the study area is generally mid-range, although it decreases in relation to the settlements and parts of the road network, such as on the A360 and at Longbarrow Roundabout. (Highways England 2018k, Chapter 7 LVIA, paras. 7.6.76).

3.2.4 Figure 10 of this Outline HIA illustrates CPRE's dark sky mapping. Each pixel shows the level of radiance (night lights) shining up into the night sky. These have been categorised into colour bands to distinguish between different light levels, such that the brightest light levels are represented by the pink, reds and browns, and the darkest levels are represented by the light and dark blues. The western part of the study area is representative of

the darkest skies, reflecting the existing agricultural land use and localised small scale settlement pattern. (Highways England 2018, Chapter 7 LVIA, paras. 7.6.155-6). Sources of lighting within the western part of the study area include vehicles on the existing A303 and the villages. At the junction of the existing A303 and the B3083, there are lighting columns, between approximately 10-12m in height, on both sides of the junction. Continuing eastwards, there is no street lighting on the existing A303 until Longbarrow Roundabout, nor adjacent to the road due to the agricultural land use. At Longbarrow Roundabout, the lighting columns extend around the edge of the existing roundabout and along part of the A360, on the approach to the roundabout. The A360 is unlit adjacent to the WHS, until Airman's Corner, which is similarly lit like Longbarrow Roundabout. (Highways England 2018k, paras. 7.6.161; 7.6.164).

3.2.5 Three representative viewpoints have been selected to be rendered as accurate visual representations (photomontages), to convey the visual context of the study area and likely views of the Bored Tunnel Extension. These viewpoints adopted for this Outline HIA were specifically selected to provide information about the potential impacts of the Bored Tunnel Extension upon key heritage assets. These viewpoints have been used previously for the DCO Scheme and Public Examination. These views are focussed on close and middle distance views to, from and between heritage receptors. The method for preparation of photomontages is set out in Appendix 7.11 – Visually verifiable montage methodology in the ES (Highways England 2018l); changes to guidance for preparation of VVM since 2018 are considered in National Highways 2022c [Redetermination document 1.4], paragraphs 3.2.19 to 3.2.25).

Table 1. Viewpoint graphics

Bored Tunnel Extension Viewpoint ID	Original DCO scheme ID	Alternative visualisation/model/cross-section direction & purpose:	From Easting	From Northing	To Easting	To Northing
ALT-01	Setting Assessment Viewpoint CH03 Photomontage (Highways England 2018e)	Views (existing A303, DCO Scheme and the Bored Tunnel Extension) looking south-west from the north-eastern end of the long barrow at AG12 Winterbourne Stoke Crossroads Barrows towards existing A303/A360 roundabout, the DCO Scheme and the Bored Tunnel Extension arrangement of the Oatlands Hill link road and slip road (National Heritage List for England (NHLE) 1011841).	409992	141495	409039	140224
ALT-02	LVIA Figure 7.101 Photomontage (Highways England 2019)	Views (existing A303, DCO Scheme and the Bored Tunnel Extension) from the location of the eastern edge of DCO Scheme Green Bridge 4 looking east, showing western approach cutting leading to the DCO Scheme western portal location.	410268	141386.5	411795	141822
ALT-03	Setting Assessment Viewpoint CH10 Photomontage (Highways England 2018e)	Views (existing A303, DCO Scheme and the Bored Tunnel Extension) looking west-south-west from long barrow NHLE 1008953 within AG19 Normanton Down Barrows. The existing view includes the A303, with the Sun Barrow (NHLE 1012370) as a prominent element to the south of the present road. This viewpoint is directly on the line of the DCO Scheme tunnel and looks down its alignment towards the western portal (450m distant), the canopy and approach road.	411541	141751	409533	141262

		For the Bored Tunnel Extension, this viewpoint captures the absence of any cutting or green bridge in views from AG19 Normanton Down Barrows towards AG13 The Diamond Group and AG12 Winterbourne Stoke Crossroads Barrows.				

3.3 Impact assessment methodology

3.3.1 This Outline HIA follows the methodology detailed in section 5.4 of the Main HIA (Highways England 2018b), with reference to the Operational Guidelines for the Implementation of the World Heritage Convention. The Outline HIA applies this methodology to the assessment of existing data collected for the Main HIA and HIA Addendum, in order to reach an understanding of the likely environmental effects of the Bored Tunnel Extension alternative. The Operational Guidelines cited in section 5.5 of the Main HIA (UNESCO 2017) were updated in 2019 and again in 2021 (UNESCO 2021); changes focussed on language consistency and the reform of the nomination process, which do not affect the present assessment.

3.3.2 This Outline HIA considers the overall impacts and effects of the Bored Tunnel Extension alternative on the OUV of the WHS, including its Attributes, Integrity and Authenticity, and comes to an overall conclusion regarding both the adverse and beneficial effects on the OUV of the WHS. It presents a qualitative assessment of the impact of the Bored Tunnel Extension on the Attributes of OUV identified in the 2015 WHS Management Plan (Simmonds and Thomas 2015).

3.4 Evaluation of heritage resource

3.4.1 The evaluation method used for the assessment of the value of heritage resources is that set out in Appendix 3a of the ICOMOS Guidance (ICOMOS 2011), as elaborated in section 5.7 of the Main HIA (Highways England 2018b).

3.5 Assessment of scale of specific impact and change

3.5.1 The scale of impact is assessed based on Guidance on HIAs for Cultural World Heritage Properties (ICOMOS 2011, Appendix 3b), and is described in full in section 5.8 of the Main HIA (Highways England 2018b).

3.6 Evaluation of overall impact

3.6.1 The method for the evaluation of overall impact is summarised in section 5.9 and detailed in section 11 of the Main HIA (Highways England 2018b).

3.7 Definition of the assessment area

3.7.1 The Assessment Area for this Outline HIA comprises the whole of the Stonehenge part of the Stonehenge, Avebury and Associated Sites WHS and its setting. This is the same as for the Main HIA undertaken for the DCO Scheme. It is acknowledged that the effects of the Bored Tunnel Extension alternative may extend beyond the boundaries of the Stonehenge part of the WHS, where assets outside the boundaries of the WHS may contribute to Attributes of OUV or have relationships with assets within the WHS expressing OUV (see section 5.10 of Main HIA (Highways England 2018b)).

3.8 Assessment assumptions and limitations

3.8.1 This Outline HIA relies on data from the existing ES and Main HIA for the DCO Scheme (Highways England 2018a; Highways England 2018b), alongside other documents including the DAMS (Highways England 2020b), the Outline Environmental Management Plan (OEMP) (Highways England 2020c), the HIA Addendum (Highways England 2020a), and the documents submitted in early 2022 in response to the Statement of Matters including Redetermination-1.5 (National Highways 2022a), which deals specifically with the most recent WHC decision (WHC, 2021). No updates have been undertaken with regards to tourism and visitor experience assessments and no additional site visits have been undertaken in relation to the present assessment.

3.8.2 The information gathered to date is considered sufficient to provide the basis of the assessment for this Outline HIA. The assumptions and limitations set out in the Main HIA (Highways England 2018b, para. 5.6.17) apply, with the following updates:

The NHLE data used for the present assessment was that available to download in December 2021. The Wiltshire and Swindon Historic Environment Record (WSHER) data used was provided in December 2021. Any subsequent changes to these datasets have not been captured by this assessment.

This assessment includes new WSHER reference numbers generated following the registration of the results of evaluation fieldwork for the scheme in the WSHER.

3.8.3 The alternative design has not been developed to the same level of outline design as the DCO Scheme. The following assumptions apply:

a) The alignment of the road within the WHS for the Bored Tunnel Extension would follow that of the DCO Scheme.

b) The Bored Tunnel Extension would not require ventilation shafts or ancillary infrastructure within the WHS.

c) The Bored Tunnel Extension would avoid the need for drainage infiltration features within the WHS and these could be located outside the WHS.

d) The Bored Tunnel Extension assumes the subsequent return of the land above the completed tunnel to agricultural use, in accordance with the Adopted Wiltshire Core Strategy Development Plan 2015 – 2026 (Wiltshire Council 2015).

e) Regarding air quality and construction noise, impacts within the WHS during the construction of the Bored Tunnel Extension alternative would be limited to the Eastern tunnel portal, its approaches and the Countess junction improvements.

f) During operation of the Bored Tunnel Extension alternative, air quality impacts associated with the extended tunnel and the A360 western re-alignment are anticipated to be comparable to that of the DCO Scheme. Compared to the DCO Scheme, the longer tunnel provided by the Bored Tunnel Extension would extend the area shielded from traffic noise and be beneficial for users of the affected area of the WHS.

g) Lighting at the tunnel portal would be hooded and directional to minimise light spill.

h) The content of this Outline HIA is dependent upon the preliminary design for the Bored Tunnel Extension as available at the time of writing (July 2022).

i) The current preliminary design for the Bored Tunnel Extension does not include landscape or drainage design and therefore this Outline HIA does not include assessment of these elements. Consequently, impacts and effects assessed in this Outline HIA could potentially be removed, reduced or offset through design mitigation measures forming part of the landscape and/or drainage designs.

j) The design of the Bored Tunnel Extension alternative has not been developed to the same level as that for the DCO Scheme. The level of assessment in the Outline HIA, therefore, is not equivalent to the full HIA undertaken for the DCO Scheme. The information provided here and previously in the environmental information is considered to be sufficient for the Secretary of State to make a robust decision on alternatives to the DCO Scheme.

k) Applicable mitigation committed to in the environmental information for the DCO Scheme would be applied to the Bored Tunnel Extension as appropriate, including implementation of relevant measures detailed in the

OEMP and the DAMS. The Outline HIA also assumes that where bespoke mitigation for the Bored Tunnel Extension would be required, this would be provided to the same level as the DCO Scheme.

l) A WHS Setting Study has been commissioned by the WHS Coordination Unit, publication of which is not expected until 2023. This HIA excludes any consideration of this work as the results are not yet available.

m) The 2011 ICOMOS Guidance on Heritage Impact Assessments for Cultural World Heritage Properties is currently being revised by UNESCO, ICCROM, IUCN and ICOMOS, emphasising integrated and participatory approaches to cultural and natural heritage impact assessment. This assessment follows the 2011 ICOMOS Guidance as revised guidance was not available at the time of writing.

3.9 Referencing and illustrations

3.9.1 The archaeological baseline is described in the Main HIA (Highways England 2018b, Section 6 Site history and description). Heritage assets that convey the Attributes of the OUV of the WHS and other heritage assets located within the WHS are set out in ES Appendix 6.1 Annex 2 - Inventory with summary descriptions (Highways England 2018e). The contribution that setting makes to the significance of heritage assets is discussed in Appendix 6.9 – Cultural Heritage Setting Assessment (Highways England 2018e). Additional aspects of Attributes of OUV are developed in annexes to the Main HIA.

3.9.2 To enable assessment of potential impacts on the Attributes of OUV of the WHS, a range of Asset Groups and discrete heritage assets that convey the Attributes of OUV have been identified; the rationale for the definition of Asset Groups is set out in the ES [paragraphs 6.6.59 – 6.6.61 and 6.6.63 – 6.6.66] (Highways England 2018a). Asset Groups are described in the Main HIA [Asset Groups and discrete assets, paragraphs 5.10.6 – 5.10.33] (Highways England 2018b).

3.9.3 A review of the Asset Groups in light of the new Historic Environment Record (HER) data confirmed that:

i. No change is necessary to the definition of the relevant Asset Groups to reflect the new HER data; and

ii. there is no change to the significance of any of the relevant Asset Groups, the impact of the proposed Scheme on those Asset Groups, or the significance of effect as assessed in the 2018 Environmental Statement (ES) or HIA or the 2020 ES and HIA Addenda arising from the identification in the new HER data of these additional features.

3.9.4 Each asset has been assigned a project-specific unique identity number (UID), as set out in the ES, paragraph 6.6.56 (Highways England 2018a). Unique ID numbers (i.e. UID 7001 – 7115) have also been assigned to additional archaeological sites and features identified since the submission of the ES (Highways England 2018a) and the DCO Examination. These are listed in Redetermination-2.1, Archaeological Gazetteer (UID 7001 – 7100) (National Highways 2022c) and in Redetermination-4.1 (UID 7101 – 7115).

3.9.5 Heritage assets are illustrated in Figures 3 to 13 of this Outline HIA. These illustrate the Bored Tunnel Extension in relation to scheduled monuments (Figure 3) and the ZTV (Figure 4); non-designated heritage assets (Figure 5) and the ZTV (Figure 6); and Asset Groups (Figure 7) and the ZTV (Figure 8). The Bored Tunnel Extension alternative is illustrated in the context of Asset Groups and tranquillity (Figure 9), dark skies (Figure 10), Public Rights of Way and other access (Figure 11) and astronomical sightlines (Figure 12). The effects of the DCO Scheme and the Bored Tunnel Extension on Asset Groups are shown on Figures 13.1 and 13.2.

4 Site History and Description

4.1 Summary overview

Introduction

4.1.1 This part of the Outline HIA sets out the spatial context, geology, topography and chronological context of the study area. It describes the historical development and character of the study area, considering the historic landscape, including field patterns, boundaries and extant historic elements of the landscape and cultural heritage.

4.1.2 The OUV of the WHS is set out, including inscription criteria, Statement of Significance (UNESCO 2008), the SoOUV (UNESCO 2013), and the description of the Attributes which convey OUV, and which contribute to Integrity and Authenticity described in the 2015 WHS Management Plan (Simmonds and Thomas 2015).

4.1.3 This section of the Outline HIA describes the condition of the whole and of individual Attributes and components, physical characteristics, sensitive viewpoints and intangible associations which may relate to Attributes. Although it focuses on the areas affected, it includes a description of the whole.

4.1.4 To avoid unnecessary duplication, where the above is covered in the Main HIA (Highways England 2018b), this part of the document sign-posts to the relevant sections.

Spatial context, geology and topography

4.1.5 The spatial context of the Assessment Area, including its geology and topography is described in section 6.2 of the Main HIA (Highways England 2018b).

Chronological context

4.1.6 The date ranges of the main archaeological periods are provided along with a detailed archaeological description of the Stonehenge and Avebury WHS from the Palaeolithic onwards in section 6.3 of the Main HIA (Highways England 2018b).

Historic landscape context

4.1.7 The Wiltshire and Swindon Historic Landscape Characterisation (HLC) forms the landscape setting of the monuments and the WHS and is detailed in section 6.4 of the Main HIA (Highways England 2018b).

Stonehenge, Avebury and Associated Sites World Heritage Site

4.1.8 The Stonehenge, Avebury and Associated Sites WHS, described in detail in the Main HIA (Highways England 2018b) is internationally important for its complexes of outstanding prehistoric monuments. Attributes of OUV are ultimately derived from the 2008 Statement of Significance and the nomination and evaluation documentation of 1985/6. The 2015 Management Plan explains the seven Attributes of OUV for the entirety of the WHS in detail. The Project location in relation to the WHS is illustrated on Figure 1.

OUV of the World Heritage Site

4.1.9 The Statement of OUV, including its development over the years, the criteria for OUV, protection and management requirements, and the Attributes which convey OUV of the WHS are detailed in section 6.6 of the Main HIA (Highways England 2018b).

Nationally and locally designated sites and non-designated heritage assets

4.1.10 Nationally designated heritage sites, namely the World Heritage Site (also designated Internationally and of International importance), scheduled monuments, listed buildings, registered parks and gardens, and conservation areas are summarised in section 6.5 of the Main HIA (Highways England 2018b). Locally designated heritage assets, non-designated heritage assets, Historic Landscape Character Areas are also described.

Periodic condition survey

4.1.11 Antiquarian investigations from the 17th century onwards have resulted in the disturbance of a large number of monuments within the area that is now the WHS. Condition surveys of monuments in 2001–2 and 2010–2011 are cited in section 6.7 of the Main HIA (Highways England 2018b).

Previous archaeological investigations in the WHS and field surveys related to the Scheme

4.1.12 A substantial number of investigations have been undertaken in recent decades, arising from both commercial and academic contexts. A selective list of the more significant investigations across the broader landscape around Stonehenge is summarised in section 6.8 of the Main HIA (Highways England 2018b) including non-intrusive surveys and archaeological evaluations undertaken for the present Scheme.

Asset Groups: baseline description and assessment of Scheme impacts and effects

4.1.13 For the purposes of heritage impact assessment, a series of 'Asset Groups' were defined in the ES and Main HIA; these are also utilised in this Outline HIA (see 3.1.18 and 3.1.19 above). These have been determined on the basis of location (e.g. proximity and topography), period, and interrelationships (e.g. inter-visibility and grouping). The use of groupings, to reflect the disposition and significance of monuments within the WHS and wider landscape, is an established approach shared by the ES.

4.1.14 The definition of Asset Groups was guided by previous assessment work related to developments within the WHS (see ES, Highways England 2018a, paras 6.6.59 to 6.6.66).

4.1.15 An overview of Neolithic and Early Bronze Age heritage assets including causewayed enclosures, long barrows, cursus monuments and barrows is provided along with an overview of Asset Groups conveying Attributes of OUV in section 6.9 of the Main HIA (Highways England 2018b). A description and assessment of each of the Asset Groups both within and outside the Stonehenge WHS is also provided in section 6.9 of the Main HIA with key sheets and maplets provided (Highways England 2018b). This section also assesses potential impacts and effects on inter-relationships between typological monument groups: causewayed enclosures and long barrows.

Discrete and isolated assets: baseline description and assessment of Scheme impacts and effects

4.1.16 Isolated and discrete heritage assets (designated and non-designated) are described and assessed in section 6.10 of the Main HIA (Highways England 2018b).

4.1.17 Designated heritage assets are illustrated on Figure 3 and non-designated assets on Figure 5 of this Outline HIA.

Tourism and visitor experience

4.1.18 A review of the tourism and visitor experience was undertaken to inform the Main HIA. This review is summarised in section 6.12 of the Main HIA (Highways England 2018b). Further details are contained in HIA Annex 9, Tourism and visitor experience (Highways England 2018c).

Public understanding of OUV

4.1.19 Ongoing visitor surveys are investigating how the knowledge and attitudes of visitors have changed due to new visitor itineraries and interpretation and assessing whether this has led to the WHS's heritage values being better

recognised and attracting support for its care (see section 6.13 of the Main HIA) (Highways England 2018b).

Public visibility of monuments

4.1.20 Parts of the Stonehenge, Avebury and Associated Sites WHS are currently visible from various roads and Public Rights of Way (PRoW) and permissive open access land. Attitudes reported in English Heritage's Phase 1 Visitor Survey are summarised, and the public visibility of heritage attractions is also considered in section 6 of the Main HIA (Highways England 2018b).

Archaeoastronomical aspects

4.1.21 The nomination and inscription criteria for the recognition of the astronomical alignment of Stonehenge is considered in section 6.15 of the Main HIA, as in the Adopted Statement of OUV and the Attributes of Outstanding Universal Value (Highways England 2018b). The ICOMOS-International Astronomical Union thematic study on astronomical heritage identifies significant astronomical alignments in the Stonehenge WHS, with reference to the sites and components that might carry the OUV of the WHS in relation to astronomy. Planning policy and archaeoastronomy is also considered.

4.1.22 The location of the Bored Tunnel Extension with regard to astronomical sightlines is illustrated on Figure 12 of this Outline HIA.

Intangible cultural heritage

4.1.23 The spiritual aspects and cultural influences of the WHS are outlined in section 6.16 of the Main HIA (Highways England 2018b).

4.2 Asset Groups in relation to the Bored Tunnel Extension

4.2.1 The footprint of the Bored Tunnel Extension alternative is contained within the DCO Scheme boundary, excepting two very small areas at the relocated Longbarrow Junction. Sections of the alternative that differ in design from the DCO Scheme are located within the western part of the WHS and beyond its western boundary, between the River Till, in the west, and Normanton Down, in the east. This section identifies the relevant Asset Groups in this area.

4.2.2 The Winterbourne Stoke Crossroads Barrows (Asset Group 12 (AG12)), including its Neolithic long barrow and the associated round barrows, are located to the north of the alternative alignment, whilst the Diamond Group (AG13) is located to the south. Both monument groups lie outside the footprint for the Bored Tunnel Extension. Late Bronze Age settlement evidence is focused around the existing Longbarrow roundabout along with a partly scheduled later prehistoric land boundary (Wessex linear) and field systems.

4.2.3 In the western part of the WHS the alignment of the Bored Tunnel Extension passes through an area where surveys indicate that there is limited archaeological survival. There are substantial groups of known monuments in the surrounding landscape including AG12 Winterbourne Stoke Crossroads Barrows and AG13 The Diamond Group (as mentioned above), whilst to the east lies the AG19 Normanton Down Barrows. South and east of the Bored Tunnel Extension alignment lies a group of isolated and discrete barrows and features, including a scheduled late prehistoric linear boundary (Wessex linear) and the Wilsford Shaft, whilst to the north, west and east of AG12 Winterbourne Stoke Crossroads Barrows lie further isolated and discrete barrows on Winterbourne Stoke Down.

4.2.4 To the west of the WHS boundary lie a number of further scheduled monuments including further barrow groups (Winterbourne Stoke West (AG03), Winterbourne Stoke East (AG04) and Winterbourne Stoke Hill ring ditches (AG05), none of which are considered to contribute to the OUV of the WHS. In this area there also is a scheduled Roman settlement site (AG07), further non-designated late Bronze Age field systems boundaries and enclosures and an Iron Age settlement on Oatlands Hill (AG09). These are addressed in the Environmental Appraisal for the Bored Tunnel Extension (National Highways 2022d).

4.2.5 Figures 2.1 and 2.2 of this Outline HIA illustrate the layout and preliminary design of the Bored Tunnel Extension. Detailed illustrations of the Bored Tunnel Extension in the context of Asset Groups and isolated designated and non-designated heritage assets are provided in Figures 3 –13.

4.3 Fieldwork undertaken in the vicinity of the Bored Tunnel Extension

4.3.1 A comprehensive programme of archaeological evaluation fieldwork was undertaken in 2018 to inform the assessment of the DCO Scheme, both inside and outside the WHS. The scope of the field work programme within the WHS was developed in consultation with HMAG and the Scientific Committee to reflect approaches employed by current academic research projects in the WHS. Outside the WHS, a similarly detailed approach was also employed to ensure a consistent approach across the DCO Scheme.

4.3.2 The fieldwork programme included detailed geophysical survey, surface artefact collection procedures including test pitting with accompanying sieving and sieving samples of the topsoil from intrusive trial trenching, as well as extensive trial trenching of the DCO Scheme Mainline footprint and land take for landscaping and excavated material deposition (for full reports

see REP1-041 to REP1-056). This provides a robust baseline against which to assess the impact of the alternative.

Area to the south-west of the current Longbarrow roundabout

4.3.3 The evaluation in this area for the DCO Scheme confirmed the presence of discrete areas of activity including possible Late Neolithic pits and ditches and associated flint scatters along the realigned A360 north (UID 2144), scattered Early Bronze Age pits, a Late Bronze Age C-shaped enclosure and associated activity (UID 2072/7106) and a possible Early Bronze Age enclosure (UID 2167/7017) at the southern end of the realigned A360 south, along with scattered Early Bronze Age pits. The survival of parts of extensive later prehistoric (Late Bronze Age onwards) land divisions (Wessex linears – for example UID 2014.02; 2048 and 2068) was also confirmed.

Western Portal and Approaches

4.3.4 The archaeological evaluation in this area for the DCO Scheme has confirmed the results of geophysical survey and previous fieldwork. The only ceremonial or funerary monument identified was a small hengiform monument (UID 2177/7092) observed in geophysical surveys; this lay just to the south of the existing A303. Funerary evidence comprised a single isolated Beaker crouched burial and a neonate burial (both completely excavated and removed during the evaluation), both of which lay outside and to the north of the new road alignment. Evidence for settlement activity was confined to artefactual material in the ploughzone and several isolated Bronze Age pits (UID 2088). Although some concentrations of worked flint material in the plough zone were apparent within the evaluation area, these did not appear to correlate to surviving features below the surface of the agricultural fields.

5 Description of the Bored Tunnel Extension alternative

5.1 Background to the Bored Tunnel Extension alternative

5.1.1 The horizontal alignment of the Bored Tunnel Extension alternative would be identical to the DCO Scheme. The highway cross section width and the structural form of the tunnel, the portals and green bridges west of the WHS would be as per the DCO Scheme.

5.1.2 From the A303 western tie-in, south of Yarnbury Castle, up to and including the River Till Viaduct, the Bored Tunnel Extension alternative would be identical to the DCO Scheme. The eastern portal, Countess junction and the eastern tie in to the A303 north of Amesbury would also be identical to the DCO Scheme.

5.1.3 The western section for the Bored Tunnel Extension alternative has not been designed to the same level of detail as the DCO Scheme, but the main differences would include:

a) Less extensive landscaping to suit the reduced volume of excavated chalk from the tunnel approach cutting.

Redesigned signs, signals, laybys and associated roadside furniture.

5.2 Bored Tunnel Extension to chainage 6+150

Layout

5.2.1 The bored tunnel would be extended westward in comparison to the DCO Scheme, with the western portal located 80m west of the western WHS boundary. The A360 would be diverted, up to 570m to the west, to pass over the realigned A303 on a bridge located not less than 450m west of the tunnel portal, in a similar location to Green Bridge 3 in the DCO Scheme. The new Longbarrow junction would take the form of a skewed dumbbell junction located in the valley north of the existing A303 and to the east of Winterbourne Stoke. The southern roundabout of the dumbbell would be connected by a new link road to a third roundabout positioned on the diverted A360. Another link from the southern roundabout of the dumbbell would tie into the existing road to Winterbourne Stoke.

Plate 1. Bored Tunnel Extension Layout

Bored Tunnel Extension

5.2.2 The eastern end of the tunnel would remain as proposed for the DCO Scheme. At the western end, the bored tunnel would be extended to 80m beyond the WHS boundary (i.e. to chainage 6+150). There would be no cut and cover tunnel section at the western portal. This would bring the total tunnel length to 4,335m comprising 4,250m of twin bored tunnel with 85m of cut and cover tunnel at the eastern portal.

5.2.3 The details of the tunnel service buildings (TSB) at the eastern and western portals would be as per the DCO Scheme, being built into the retained cutting, immediately outside the tunnel portals.

5.2.4 The horizontal alignment and the cross section of the twin bored tunnel would be as per the DCO Scheme. Vertical alignment within the tunnel has not been confirmed within the preliminary design, but a longer bored tunnel would result in the low point of the tunnel being deeper than for the DCO Scheme. The minimum depth to crown (depth to the top of the tunnel bore) would be within the Limits of Deviation of the DCO Scheme.

A303 Mainline

5.2.5 The Mainline horizontal alignment of the new A303 would be retained as per the DCO Scheme, but the vertical alignment would change to suit the tunnel extension. At the western end of the tunnel, the A303 finished road level

would need to be at least 15m below existing ground level. This is to protect against ground disturbance during tunnel boring.

5.2.6 The approach cut would remain over 10m deep for the first 600m west of the tunnel portal, before emerging into the head of a dry valley where the ground level drops to meet the rising road levels. At about the same location, the vertical alignment of the A303 would have risen to the level as proposed in the DCO Scheme.

New Longbarrow Junction

5.2.7 The form of the new Longbarrow junction would be a skewed dumbbell junction comprising two roundabouts connected by a link road over the A303. Two sliproads at each roundabout would provide for all turning movements on and off the A303. The link road between the dumbbell roundabouts would be a dual carriageway crossing over the A303 at about chainage 4+900. The roundabouts and the link road between them would have street lighting mounted on posts 8m high.

5.2.8 The A360 would be diverted up to 570m to the west to pass over the realigned A303 on a bridge located not less than 450m west of the tunnel portal. Tie-in points to the existing A360 would be as per the DCO Scheme. Most of the length of this diversion would be in a shallow cut, 2 to 3m deep.

5.2.9 A third roundabout would be required to provide access between the A360 and Longbarrow junction. This roundabout would be located south of the tunnel, in the same location as the Longbarrow junction southern dumbbell proposed in the DCO Scheme. It would be contained within a 2m deep cut. No street lighting is proposed on the A360, or on this roundabout, as it would be visible from the WHS. To mitigate the absence of lighting it is proposed that the roundabout would be signal controlled.

5.2.10 Vehicular access to the village of Winterbourne Stoke would be via the existing A303 which would be downgraded and de-trunked. It would connect to the skewed Longbarrow junction via a fifth leg to the southern dumbbell roundabout.

Temporary Traffic Diversions

5.2.11 In order to build the Bored Tunnel Extension and new Longbarrow junction, it would be necessary to divert the A303. Design of the diversions and the traffic management strategy would be dependent on the construction methodology and programme to be determined by the main works contractor. For the purposes of this Appraisal, the following construction sequence has been assumed:

- Stage 1: With traffic on existing A303 and existing A360 construct a temporary diversion for the A303 from the existing Longbarrow roundabout, around the north of the site for the proposed A360 bridge and tying back to the existing A303 to the south of the proposed new Longbarrow Junction. Include a temporary bridge to cross the route of the new A303.

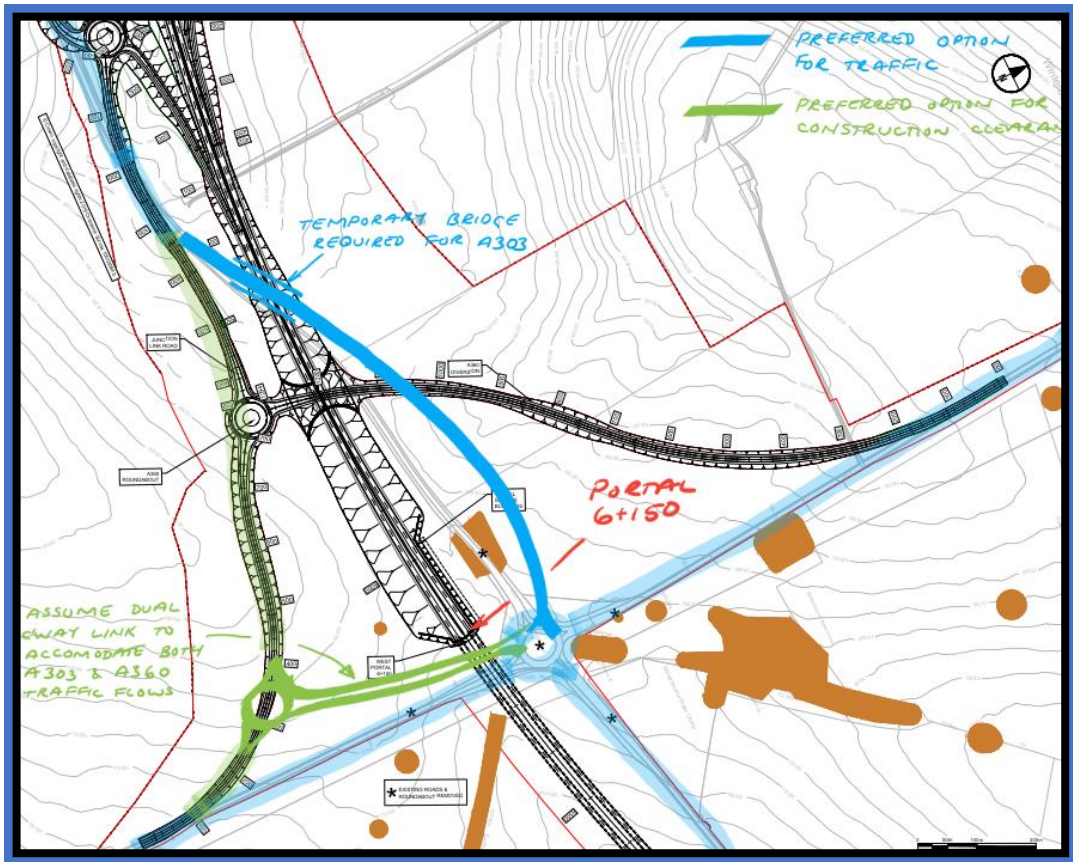
- Stage 2: Retain the A360 on its existing route but divert the A303 onto the temporary diversion. Commence construction of the remainder of the junction and of the tunnel. Some local diversions and Traffic management will be required at tie-ins.

- Stage 3: On completion of the new A360 bridge, divert the A303 traffic on to the new bridge and remove the temporary bridge. Continue construction of junction and tunnel.

- Stage 4: On completion of Longbarrow Junction and of Winterbourne Stoke Bypass, divert A303 traffic on to one carriageway of the bypass. The other carriageway would be kept as a construction route to complete the tunnel. At this stage all A303 traffic would remain diverted over the A360 bridge as at Stage 3.

- Stage 5: After opening of the tunnel, the A360 would be diverted onto its new alignment and the temporary diversion removed.

Plate 2. Temporary traffic diversions for the Bored Tunnel Extension



5.3 Assumptions and limitations

5.3.1 The following assumptions and limitations apply:

a) Data used in this Outline HIA derive from the Main HIA; therefore, the assumptions and limitations of the Main HIA also apply.

b) The design of the Bored Tunnel Extension alternative has not been developed to the same level of outline design as the DCO Scheme.

5.3.2 This Outline HIA is therefore based on a series of design assumptions, set out in Table 2.

Table 2. Comparison of design assumptions for DCO Scheme and the Bored Tunnel Extension

DCO Scheme	Bored Tunnel Extension
Western tunnel approaches in retained cutting to west of, and within western part of the WHS. Cutting varies in depth between approximately 7m and 10m. The top approximately 2.5m of the cutting would have approximately 1 in 2 grassed slopes. The bottom of the cutting would comprise vertical retaining walls. Green bridge c.150m in length between c.150m and 300m from the western WHS boundary i.e. from chainage 6+415 to 6+565. Start of the cut and cover tunnel portal within the WHS at chainage 7+200. The cut and cover section is 200m long and the bored tunnel commences at chainage 7+400. The Limits of Deviation allow for the bored tunnel and/or the cut and cover tunnel to be extended up to 200m westwards and reduced by a nominal 1m eastwards.	Bored tunnel portal outside the WHS at chainage 6+150, c.80m west of the western boundary of the WHS. Western approach cutting wider and deeper to accommodate bored tunnel portal. Tunnel service buildings (TSB) relocated to immediately outside the tunnel portal on the north side of the proposed A303.
At the eastern portal, the Bored Tunnel Extension retains the layout proposed for the DCO scheme: the bored tunnel terminates at chainage 10+400 and an 85m cut and cover length puts the eastern portal at chainage 10+485. Limits of Deviation for the eastern portal allow for the bored tunnel to be extended up to 30m eastwards and reduced by a nominal 1m westwards.	
Longbarrow junction, a new grade separated junction with the A360 is proposed c.570m to the west of the WHS boundary. Removal of Longbarrow roundabout within the WHS and elements of the A360.	Relocation of Longbarrow junction to provide a new skew dumbbell junction located c.1,340m west of the western boundary of the WHS. Removal of Longbarrow roundabout within the WHS and elements of the A360.
The junction would not have street lighting but both roundabouts would be signal controlled (i.e. traffic lights).	The two junction roundabouts and the link road between them would be lit. The A360/A303 roundabout would not have street lighting but would be signal controlled.
New A360 northern and southern link roads, moved west from the WHS boundary.	Reconfigured A360 link road roundabout, located c.530m west of the western boundary of the WHS on Oatlands Hill. Reconfigured A360 northern and southern link roads, on similar alignment to the DCO Scheme, with additional green bridge required to cross the tunnel approach cutting.
The tunnel would be 3,285m long constructed as follows: - From western portal 200m of cut and cover. - Central 3,000m of twin bored tunnel. - 85m of cut and cover to the eastern portal.	The tunnel would be 4,335m long constructed as follows: - From western portal 4,250m of twin bored tunnel. - 85m of cut and cover to the eastern portal.

5.3.3 Construction methods relevant to the assessment of DCO Scheme impacts on the OUV of the WHS are set out in section 7.5.9 of the Main HIA (Highways England 2018b). Further details of construction techniques are set out in ES Chapter 2, The Scheme (Highways England 2018a). It is assumed that such typical construction techniques would also be used in constructing the Bored Tunnel Extension alternative.

6 Potential Impacts arising from construction and operation of the Bored Tunnel Extension

6.1.1 The construction phase is defined as the temporary activities involved in building the Bored Tunnel Extension alternative, and its subsequent permanent presence once constructed. The operational phase comprises the situation when the completed Bored Tunnel Extension alternative is being used by traffic. Physical impacts upon assets would only occur during the construction phase; impacts upon assets' setting would arise during both the construction and operation phases. Impacts upon setting may be either positive or negative.

6.1.2 As with the DCO Scheme, the construction of the Bored Tunnel Extension alternative would have potential for benefits to cultural heritage. These include:

a) Removing existing highway and associated infrastructure from the WHS.

b) Removing existing physical severance caused by the current A303.

a) Reducing aural and visual intrusion by removing or reducing the volume of moving and stationary traffic.

b) Re-establishing he visual prominence or dominance of monuments.

c) Removing intrusions that disrupt astronomical / solstitial relationships.

d) Improving lighting ambience and dark skies.

e) Reuniting historic landscapes and agricultural land parcels, that result in changes to land-use patterns, leading to improvements to land management regimes for monuments that contribute to the OUV of the WHS.

f) Reuniting the landscape providing opportunities to enhance conservation, interpretation, understanding and access to monuments that contribute to the OUV of the WHS.

g) Reduction in visitor footfall numbers in parts of the WHS during construction and operation.

h) Improved local and visitor perceptions of the significance and influences of cultural heritage and intangible and sacred heritage.

6.1.3 Similarly, as with the DCO Scheme the Bored Tunnel Extension alternative would also have the potential for adverse impacts upon cultural heritage, including:

a) Partial or total removal of heritage assets, including archaeological remains, within the construction footprint of the Bored Tunnel Extension alternative.

b) Compaction of archaeological deposits by construction traffic and structures.

c) Temporary impacts upon the settings of heritage assets, including those that convey the Attributes of OUV.

d) Permanent impacts upon the setting of heritage assets, including those that convey the Attributes of OUV.

e) Changes to key views and sight-lines.

f) Potential light spill at tunnel portals.

g) The presence of new road infrastructure including carriageways, tunnel portals, lighting, signage etc., in views to and from monuments and across the wider landscape of the WHS and severance of relationships (visual and physical) between monuments.

h) The severance of relationships (visual and physical) between monuments and severance of relationships (visual and physical) between monuments and the landscape.

i) The loss of 'free' views of the Stonehenge monument and prominent upstanding barrows in the landscape for people in vehicles travelling along the existing A303.

j) Severance of historic landscapes and agricultural land parcels, that result in changes to land-use patterns, leading to degradation and erosion of monuments due to changes in land management regimes.

k) Changes in visitor footfall numbers in parts of the WHS during construction and operation of the Scheme, which lead to the degradation of monuments that contribute to the OUV of the WHS – whether situated in the Stonehenge or Avebury parts of the WHS.

l) Changes to badger sett positions and badger activity, and ensuing damage to barrows and other archaeological remains.

m) Changes to lichen communities growing on the stones at Stonehenge.

6.1.4 Construction dust emissions generated during tunnelling operations and portal construction may impact the lichen community found on the standing stones at the Stonehenge monument, located over 2.7km from the nearest tunnelling activities. Dust emissions would be controlled via standard mitigation measures.

6.1.5 During tunnelling, vibration from construction works is predicted to be significantly below the Lowest Observable Adverse Effect Level (LOAEL) at Stonehenge; this level of vibration is not generally considered to be perceptible. Significant impacts upon archaeological monuments and deposits due to construction vibration are not anticipated. The possibility of physical and other effects on heritage assets positioned above the tunnel would be managed through the placement and operation of ground movement monitoring stations during construction works.

6.1.6 During operation, a major reduction in traffic noise level is predicted along the tunnelled section of the Scheme, including at Stonehenge. Outside of the tunnelled section, decreases in traffic noise levels would occur on the existing A303 alignment, and increases on the new alignment. However, the cuttings on the tunnel approaches would minimise the propagation of traffic noise from the A303, compared to the existing alignment on the surface. Noise generated within the tunnel would result in higher noise levels in the vicinity of the portals, however, this is minimised by the inclusion in the design of absorptive lining at the tunnel portals.

6.1.7 Impacts related to decommissioning are as those described for the Scheme in the Main HIA, section 9.2.14 – 9.2.25 (Highways England 2018b).

7 Mitigation

7.1 Mitigation strategy

7.1.1 Proposals for archaeological excavation, recording and monitoring, protection measures, archaeological fieldwork and recording strategy, post-excavation assessment, analysis, reporting, dissemination and archiving, public interpretation, access and engagement are summarised in section 8.3 of the Main HIA (Historic England 2018b).

7.1.2 The Detailed Archaeological Mitigation Strategy (DAMS) sets out the detailed strategy with regards to archaeological mitigation works for the DCO Scheme (see Highways England 2020b). The Outline Environmental Management Plan (OEMP) sets out the principles and procedures with regards to the management of the environment and environmental issues during the detailed design phase and for both the preliminary and main works elements of the construction of the DCO Scheme (Highways England 2020c). Both documents remain relevant with regards to the Bored Tunnel Extension alternative.

7.2 Mitigation measures specific to the Bored Tunnel Extension

7.2.1 The Bored Tunnel Extension would require construction of the new skewed Longbarrow Junction to the east of Winterbourne Stoke Hill. This would require changes to the DAMS requirements for some Mitigation Action Areas here where archaeological mitigation would not be required under the DCO Scheme, including areas X10 and X11 (proposed contractors' working areas not requiring mitigation (see DAMS Appendix D.2), and area 15.9 some DAMS Mitigation Action Areas including X10, X11 and area 15.9 (see DAMS Appendices D.1 and D.2) (proposed preservation of archaeological remains in place beneath shallow landscape fill, see DAMS Appendix D.1). These areas would require archaeological mitigation works in advance of construction of the Bored Tunnel Extension alternative.

7.2.2 The A360 North Link Road and A360 South Link Road would be on a similar alignment to the DCO Scheme, requiring similar archaeological investigation and recording in advance of construction as the DCO Scheme and as outlined in the DAMS (Highways England 2020b – Appendix D.1, Areas 16.1, 16.2, 16.4, 19 and 52.1 to 52.4).

7.2.3 The Western Portal would have a similar construction footprint to the eastern part of the proposed Longbarrow junction in the DCO Scheme, requiring some minor adjustments to archaeological mitigation areas, particularly within areas 16.3 and X14 (DAMS Appendices D.1 and D.2). A temporary

road diversion will also require archaeological investigation and recording in advance of construction across Area X14.

7.2.4 Archaeological investigation and recording would not be required in DAMS Mitigation Action Area 24, within the western part of the WHS, as archaeological remains here would not be impacted due to the longer bored tunnel extending to chainage 6+150.

8 Assessment and evaluation of impacts and effects of the Bored Tunnel Extension

8.1.1 This Outline HIA considers the potential impacts and effects of the Bored Tunnel Extension alternative on individual Attributes of OUV. It carries forward the results of the detailed assessments presented in the Main HIA for the areas within and in the vicinity of the WHS where the DCO Scheme elements are unaltered. An appraisal has been undertaken for those areas and Attributes upon which the Bored Tunnel Extension alternative would impact.

8.1.2 The Outline HIA takes account of both positive and negative impacts to arrive at an overall conclusion regarding the effect of the Bored Tunnel Extension alternative on the Attributes of OUV and the Integrity and Authenticity of the WHS. In making this balanced judgement, a precautionary approach has been adopted to avoid overstating positive impacts and beneficial effects where these arise.

8.1.3 All assessments are based on change against the current baseline; and appraisal outcomes are also compared against the effects assessed for the DCO Scheme where relevant.

8.1.4 This section of the Outline HIA assesses:

a) The existing effects of the surface A303; and

b) Impacts and effects of the Bored Tunnel Extension alternative on:

i. Asset Groups and discrete designated and non-designated heritage assets.

ii. Aspects of the WHS including typological groupings, archaeological remains within the construction footprint, artificial lighting, astronomical aspects, public visibility of monuments, tourism and the visitor economy, changing patterns of access in the WHS, conservation related to tourism, aspects of intangible cultural heritage, public understanding of OUV.

iii. The Attributes which convey the OUV of the WHS, as identified in the 2015 WHS Management Plan (Simmonds and Thomas 2015):

1. Stonehenge itself as a globally famous and iconic monument.

2. The physical remains of the Neolithic and Bronze Age funerary and ceremonial monuments and associated sites.

3. The siting of Neolithic and Bronze Age funerary and ceremonial sites and monuments in relation to the landscape.

4. The design of Neolithic and Bronze Age funerary and ceremonial sites and monuments in relation to the skies and astronomy.

5. The siting of Neolithic and Bronze Age funerary and ceremonial sites and monuments in relation to each other.

6. The disposition, physical remains and settings of the key Neolithic and Bronze Age funerary, ceremonial and other monuments and sites of the period, which together form a landscape without parallel.

7. The influence of the remains of the Neolithic and Bronze Age funerary and ceremonial monuments and their landscape setting on architects, artists, historians, archaeologists and others.

iv. Impacts on the Integrity and Authenticity of the WHS.

v. Impacts on the overall OUV of the Stonehenge component of the WHS.

8.1.5 This Outline HIA takes a holistic approach to assessment and considers the long-term implications of the Bored Tunnel Extension alternative for the OUV of the WHS.

8.1.6 The Outline HIA deals only with impacts on OUV and therefore does not examine impacts on other heritage assets that do not contribute to OUV as defined in the SoOUV.

8.2 Existing effects of the surface A303

8.2.1 The existing A303 has a major adverse impact on the OUV of the WHS (see the Main HIA, Appendix 6.1, Section 9.1; Highways England 2018b). It adversely effects the settings of many of the monuments within the WHS, including Stonehenge itself, and the interrelationships between monuments. These settings and interrelationships are Attributes of the OUV of the WHS alongside other aspects including the design in relation to the skies and astronomy. The existing A303 also restricts and severs access, and impacts the quality of the visitor experience, such that the vast majority of visitors are able to appreciate only part of the WHS.

8.2.2 The existing A303 impacts upon Attributes of OUV, due to:

a) Visual intrusion due to views of moving and stationary traffic on the road, particularly high-sided vehicles.

b) Visual intrusion due to the presence of the A303 surface route, including signage clutter and lamp standards (particularly at Longbarrow junction).

c) Night-time visual intrusion due to light spill / light pollution from lit junctions at Longbarrow and Countess, and from traffic head- and tail lights.

d) Intrusion on solstitial alignments (see HIA Sections 6.6, OUV of the World Heritage Site and 6.15, Archaeoastronomical aspects). The ICOMOS-International Astronomical Union thematic study on astronomical heritage notes that '*Although the A344 has been closed to great effect, the A303 remains a major problem for some of these sightlines and a road tunnel would be an excellent solution*.' (Chadburn and Ruggles 2017, 62).

e) Views from the south-west, for example from the 'Sun Barrow', along the solstitial alignment of the midsummer sunrise towards Stonehenge and the Avenue beyond.

f) Aural intrusion due to traffic noise.

g) Air quality impacts on human receptors due to traffic fumes.

h) Severance of visual and physical relationships between monuments, between Asset Groups and their relationships with the landscape. This includes visual and aural intrusion, including intrusion on views between heritage assets and Asset Groups – in particular:

i. Severance of linkage between AG12 Winterbourne Stoke Crossroads Barrows and AG13 The Diamond Group;

ii. Severance of the AG19 Normanton Down Barrows, splitting the group from a northerly element, three bowl barrows immediately north of the A303 on Stonehenge Down (NHLE 1012369);

iii. Severance of AG24 Stonehenge Bottom / Luxenborough Barrows, splitting the group from a northerly element, a bowl barrow 300m south west of New King Barrows (NHLE 1008947);

iv. Severance of AG27 the Avenue;

v. Severance of AG30 the Avenue Barrows;

vi. Within AG30 the Avenue Barrows, the southern side of the bowl barrow 150m east of Stonehenge Cottages on A303 (NHLE 1012129) is cut through and has been partially removed by the existing A303 road; and

vii. Severance of the long barrows identified by Roberts et al. (2018) set around the Wilsford/Normanton dry valley.

8.2.3 The impact of rat-running and traffic jams along the Packway and Fargo Road in the north of the WHS, and the B3086 and the A360 along the western edge of the WHS. This rat-running is caused by traffic attempting to avoid congestion on the existing A303.

8.2.4 The existing A303 effectively prevents safe access to the Stonehenge WHS to the south, limiting access to the wider prehistoric landscape. This restricts opportunities for interpretation and the transmission of its significance, limiting the ability of the public to appreciate and understand the archaeology of the WHS.

8.2.5 Severance of Asset Groups in the WHS and visual and aural intrusion caused by modern routes, includes AG12 Winterbourne Stoke Crossroads Barrows, AG11 Lesser Cursus Barrows and AG10 Rollestone Barrows, which are severed by the course of the A360 / B3086, which forms the western boundary of the WHS.

8.2.6 The existing A303 impacts upon the Attributes of OUV. These are detailed in the Main HIA (Highways England 2018b, 9.1.9 - 9.1.25), and summarised here:

1. **Stonehenge itself as a globally famous and iconic monument** – The immediate and near distance setting of the monument is dominated by traffic on the existing A303 and the visual intrusion of illegally parked vehicles on byways. The existing A303 has a Moderate negative impact on this Attribute of OUV, leading to a Large adverse effect.

2. **The physical remains of the Neolithic and Bronze Age funerary and ceremonial monuments and associated sites** – The existing A303 impacts upon the setting of all monuments from which it is visible and audible and the WHS as a whole. The road also intrudes in views of the setting sun from Stonehenge during the winter solstice. The existing A303 has a Moderate negative impact on this Attribute of OUV, leading to a Large adverse effect.

3. **The siting of Neolithic and Bronze Age funerary and ceremonial sites and monuments in relation to the landscape** – The existing A303 severs relationships between a number of monuments and their wider landscape, including AG22 Stonehenge, AG27 The Avenue, AG26 The King Barrows (Old and New King Barrows), the AG19 Normanton Down Barrows and numerous barrows to the south of the A303. The existing A303 has a Minor negative impact on this Attribute of OUV, leading to a Moderate adverse effect.

4. **The design of Neolithic and Bronze Age funerary and ceremonial sites and monuments in relation to the skies and astronomy** – The existing A303 impacts upon the midsummer sunrise / midwinter sunset solstitial axis affecting AG22 Stonehenge, the Sun Barrow (part of AG19 Normanton Down Barrows), and the AG27 The Avenue. The lights of traffic along the present road adversely affect the ability to observe the midwinter sunset. This is a Minor negative impact on this Attribute of OUV, leading to a Moderate adverse effect.

5. **The siting of Neolithic and Bronze Age funerary and ceremonial sites and monuments in relation to each other** – Relationships between many monuments in the WHS are severed by the existing A303, which interrupts sightlines with visual distraction and clutter, and causes physical severance. The existing A303 has a Moderate negative impact on this Attribute of OUV, leading to a Large adverse effect.

6. **The disposition, physical remains and settings of the key Neolithic and Bronze Age funerary, ceremonial and other monuments and sites of the period, which together form a landscape without parallel** – The existing A303 has a negative impact on the setting of a range of monuments and sites including AG22 Stonehenge, AG27 The Avenue, AG23 The Greater Cursus, AG19 Normanton Down Barrows, the AG12 Winterbourne Stoke Crossroads Barrows, AG13 The Diamond Group and other related assets. The A303 not only severs relationships between Asset Groups and discrete assets, it also physically severs a number of barrows, cutting through them or clipping parts of monuments. The existing A303 has a Moderate negative impact on this Attribute of OUV, leading to a Large adverse effect.

7. **The influence of the remains of the Neolithic and Bronze Age funerary and ceremonial monuments and their landscape setting on architects, artists, historians, archaeologists and others** – The existing A303 is highly visible in many views in the landscape and blights appreciation of views and the landscape setting. However, the view of Stonehenge from vehicles descending from King Barrow Ridge to Stonehenge Bottom along the A303 is highly appreciated by many. The existing A303 has a Negligible negative impact on this Attribute of OUV, leading to a Slight adverse effect.

8.2.7 The existing A303 has visual, aural and access impacts on the Integrity of the WHS. Overall, the existing A303 has a Major negative impact on Integrity, leading to a Large adverse effect. Overall, the existing A303 has a Negligible negative impact on Authenticity, leading to a Slight adverse effect.

8.2.8 The existing A303 is assessed as having a Moderate negative impact on the OUV of the Stonehenge component of the WHS. The significance of effect of the existing surface A303 on the overall OUV of the Stonehenge component of the WHS is assessed as Large adverse.

8.3 Effects of the Bored Tunnel Extension

8.3.1 This section of the Outline HIA sets out the effects resulting from the Bored Tunnel Extension, including the differences in effects in comparison to the DCO Scheme.

8.3.2 The impacts and effects for the Bored Tunnel Extension are summarised in Table 3, detailed in **Error! Reference source not found.**, and discussed below.

8.3.3 The Asset Groups subject to significant positive changes to setting in comparison to the DCO Scheme are:

a) Winterbourne Stoke Crossroads Barrows (AG12) - in the DCO Scheme the resultant significance of effect is Moderate beneficial, whereas for the Bored Tunnel Extension the resultant significance of effect is Large beneficial;

b) The Diamond Group (AG13) - in the DCO Scheme the resultant significance of effect is Slight adverse, whereas for the Bored Tunnel Extension the resultant significance of effect is Slight beneficial; and

c) Normanton Down Barrows (AG19) - in the DCO Scheme the resultant significance of effect is Moderate beneficial, whereas for the Bored Tunnel Extension the resultant significance of effect is Large beneficial.

8.3.4 For both the North Kite Enclosure and Lake Barrows (AG16) and the Bowl barrow 450m south of the A344 on Stonehenge Down (AG17), the Bored Tunnel Extension alternative and the DCO Scheme will result in the same Slight beneficial and Moderate beneficial effects.

Impacts and effects on Asset Groups and discrete designated and non-designated heritage assets

8.3.5 A substantial number of significant beneficial effects (Moderate and Large beneficial) would result from the Bored Tunnel Extension alternative.

Winterbourne Stoke Crossroads Barrows (AG12)

8.3.6 The Bored Tunnel Extension would be in tunnel c.120m to the south of the most southerly element of AG12, long barrow NHLE 1011841. Longbarrow roundabout, presently located adjacent to long barrow NHLE 1011841, would be removed; the new Longbarrow junction would be c.1,300m to the west. Traffic would be removed from the A303 and A360 in close proximity to AG12 Winterbourne Stoke Crossroads Barrows. The A360 Northern Link Road would be constructed in a shallow cutting c. 80m north-west of NHLE 1011047, which is the closest element of AG12 to the new link road. With the Bored Tunnel Extension, the proposed location of the A360 roundabout would be c.630m north-west of Oatlands Hill, screened by the natural topography. However, the western portal and approach cutting would be located c.160m south-west of long barrow NHLE 1011841, potentially resulting in traffic noise and light spill as the traffic exits the tunnel. Land above the Bored Tunnel Extension would be returned under agricultural use following construction.

8.3.7 As with the DCO Scheme, there would be no change to the physical fabric of AG12 due to construction of the Bored Tunnel Extension.

8.3.8 As with the DCO Scheme, the A303 and A360 close to AG12 would be removed and replaced with byways for non-motorised users. The realignment of the A360 and the new Longbarrow junction, and placement of the A303 in bored tunnel, would benefit the setting of the monuments within the asset group. This would improve visitors' ability to appreciate the asset group's setting, in the context of reduced views of roads, signage and the removal of lighting poles. The benefits would be greatest for the more south-westerly and westerly monuments, including the long barrow and those flanking the present A360 and A303. The setting of those monuments already at greater distances from the present roads would benefit to a somewhat lesser extent.

8.3.9 The current views of the traffic on the A360 and Longbarrow roundabout would be removed, improving the southward sightlines from the asset group, as with the DCO Scheme. Both the AG12 Winterbourne Stoke Crossroads Barrows and AG13 The Diamond Group to the south-east would be seen without the current backdrop of the A303. The physical landscape severance caused by the existing A303 between AG12 Winterbourne Stoke Crossroads Barrows and AG13 The Diamond Group would be removed. The construction of the Bored Tunnel Extension would not require a new cutting within the western part of the WHS, in contrast to the DCO Scheme, thus reducing physical landscape severance from the construction of the new road. However, in comparison to the DCO Scheme the proximity of the tunnel portal and approach cutting may result in limited intrusion due to traffic noise and light spill from the tunnel portal affecting principally the westernmost extent of AG12.

8.3.10 Longer-distance sightlines would be improved, particularly in respect of views to AG13 The Diamond Group and south-east towards AG19 Normanton Down Barrows by the removal of the A303 into the Bored Tunnel Extension, in comparison to the DCO Scheme. The reverse views would be similarly improved. The restrictions on intervisibility imposed by existing plantations would remain, as would modern farming activities.

8.3.11 On the following monuments the effect of the Bored Tunnel Extension would be Large beneficial (derived from a Major positive and Minor negative impacts on a Very High value asset): NHLE 1011841 (long barrow), NHLE 1011047, 1011843, 1011842, NHLE 1012368, 1012382. The Bored Tunnel Extension would result in a **Large beneficial effect** overall on AG12 Winterbourne Stoke Crossroads Barrows.

8.3.12 This is in comparison to the DCO Scheme, for which an overall Moderate beneficial significance of effect on AG12 Winterbourne Stoke Crossroads Barrows was assessed, deriving from a Very Large beneficial effect due to removal of the surface A303 from the immediate environs of AG12and a Moderate adverse effect due to the presence of the new cutting on the setting of AG12.

The Diamond Group (AG13)

8.3.13 For the Bored Tunnel Extension, the western approach cutting would be located c.30m to the north of the most westerly outlying element of AG13 The Diamond Group, bowl barrow NHLE 1011045. The tunnel portal would be c.140m north-east of NHLE 1011045. Longbarrow roundabout, presently located c.225m north-east of barrow NHLE 1011045, would be removed; the new Longbarrow junction would be c.1,180m to the west. Traffic would be removed from the A303 and A360 in the vicinity of the eastern parts of AG13 The Diamond Group; the relocation of the A360 to the A360 Southern Link Road would remove the severance created by the existing A360 between barrow NHLE 1011045 and the other heritage assets within AG13. The A360 Northern and Southern Link Roads would be located c.360m west of and 160m south of barrow NHLE 1011045, respectively.

8.3.14 Mitigation would include ground movement monitoring and vibration monitoring during the construction of the Bored Tunnel Extension.

8.3.15 As with the DCO Scheme, there would be no change to the physical fabric of AG13 The Diamond Group due to the Bored Tunnel Extension.

8.3.16 As with the DCO Scheme, the A360 would be moved west, reuniting AG13, but the tunnel approach cutting and Bored Tunnel portal would be closer to the westernmost extent of the group. The existing A303 and A360 would be removed and replaced with byways for non-motorised users. The realignment of the A360 and the new Longbarrow junction, and placement of the A303 in the extended bored tunnel, would benefit the setting of most of the monuments within AG13 and reunite bowl barrow NHLE 1011045 with the potentially inter-visible and interrelated barrow cemeteries of the group to the east and south. The approach road to the tunnel would be in a deep cutting and the A360 link roads in shallower cuttings. These elements of the Bored Tunnel Extension would be visible from NHLE 1011045, but not from the more easterly and southerly elements of AG13 The Diamond Group.

8.3.17 The current views of the traffic on the A360 and Longbarrow roundabout would be removed from most of AG13 The Diamond Group, improving the sightlines from the asset group to the north and east, as with the DCO Scheme. The AG19 Normanton Down Barrows and the AG12 Winterbourne

Stoke Crossroads Barrows would be seen without the current backdrop of the A303. The physical landscape severance caused by the existing A303 between AG12 Winterbourne Stoke Crossroads Barrows and AG13 the Diamond Group would be largely removed. The construction of the Bored Tunnel Extension would not require a new cutting within the western part of the WHS, in contrast to the DCO Scheme, thus reducing physical landscape severance from the construction of the new road. However, in comparison to the DCO Scheme the tunnel portal and approach cutting would affect the setting of NHLE 1011045, in particular, due to traffic noise, poor air quality and the potential for light spill from the tunnel portal.

8.3.18 As with the DCO Scheme, longer-distance sightlines from other parts of AG13 The Diamond Group would be improved, particularly in respect of views towards AG12 Winterbourne Stoke Crossroads Barrows. The reverse views would be similarly improved. The restrictions on inter-visibility imposed by existing plantations would remain, as would modern farming activities.

8.3.19 Traffic would be removed from much of the setting of AG13 The Diamond Group, with traffic head- and tail-lights concealed within the tunnel, traffic noise reduced and noise and air quality enhanced compared to the current baseline conditions. This would bring improvements to the northward and eastward sightlines from AG13 The Diamond Group, as with the DCO Scheme. However, at NHLE 1011045 the proximity of the Bored Tunnel Extension tunnel portal and approach cutting would introduce new elements into the landscape, bringing traffic noise, poor air quality and potential light spill from the tunnel portal.

8.3.20 The introduction of a new tunnel portal and dual carriageway in cutting north of the most westerly asset within AG13, NHLE 1011045, would be a Moderate negative change. The decommissioning of the present A303 and, in particular, the part of the A360 that severs the vast majority of the asset group from NHLE 1011045 would be a Moderate positive change. Overall, the Bored Tunnel Extension would result in a **Slight beneficial effect** on AG13 The Diamond Group.

8.3.21 This is in comparison to the DCO Scheme for which an overall Slight adverse effect was assessed, deriving from a Moderate beneficial effect due to removal of the A303 and A360 from the immediate environs of AG13 The Diamond Group, and a Large adverse effect on the setting of AG13 due to the new retained cutting .

Normanton Down Barrows (AG19)

8.3.22 The majority of assessed impacts and resultant effects for the AG19 Normanton Down Barrows would be the same as for the DCO Scheme. The

changes associated with the Bored Tunnel Extension, compared to the DCO Scheme, would affect principally the northernmost part of the group, AG19A (Normanton Down Barrows (north)). This is due to the replacement of the cutting in the western part of the WHS under the DCO Scheme with an extended bored tunnel, as a result of which views westwards from the northern end of AG19 would no longer include the western approach cutting and Green Bridge 4 as they would with the DCO Scheme.

8.3.23 With the Bored Tunnel Extension alternative the A303 would be in bored tunnel beneath the northern part of AG19, as with the DCO Scheme. There would be no physical impacts upon long barrow NHLE 1008953 or the northern part of the AG19 Normanton Down Barrows as the bored tunnel would be at least 20m below archaeological horizons at this point. The existing A303 surface road would be removed from much of the WHS, including where it severs the northern part of the AG19 Normanton Down Barrows. The current severance of the solstitial alignment between AG22 Stonehenge and the Sun Barrow NHLE 1012370 in AG19A Normanton Down Barrows (north) due to the existing surface A303 would also be removed, as with the DCO Scheme. The decommissioned A303 would be converted to a restricted byway, physically reuniting monuments within the group and reconnecting them with other monuments on Normanton Down, and to the landscape across the northern and southern parts of the WHS. This would do much to restore their setting, general sense of place, and the visitor's ability to appreciate them within the landscape.

8.3.24 The Bored Tunnel Extension's tunnel portal and approach road cutting would be located c.1,620m west of the most westerly elements of AG19A Normanton Barrows (north); the relocated Longbarrow junction would be located c.2,800m to the west.

8.3.25 Mitigation would include ground movement monitoring and vibration monitoring during the construction of the bored tunnel. Archaeological monitoring would be undertaken during removal of hardstanding material from the course of the existing A303 to create a restricted byway.

8.3.26 As with the DCO Scheme, the current views of distant traffic at the Longbarrow roundabout would be removed, improving the sightlines to and from the asset group. Views from numerous individual monuments would be improved, and compromised sightlines restored, compared with the current baseline conditions. The Bored Tunnel Extension would further improve longer distance views westwards from the northern parts of the asset group (AG19A, Normanton Down Barrows (north)), compared to the DCO Scheme. Longer-distance sightlines would be improved, particularly in respect of views to AG12 Winterbourne Stoke Crossroads Barrows and AG13 The

Diamond Group, from the northern part of AG19. The reverse views would be similarly improved. The restrictions on inter-visibility imposed by existing plantations would remain, as would modern farming activities.

8.3.27 As with the DCO Scheme, the decommissioning of the present surface A303 that severs the group would be a positive change. Traffic would be removed from the setting of AG19A Normanton Down Barrows (North). Traffic/light spill intrusion into the solstitial alignment between AG22 Stonehenge and the Sun Barrow NHLE 1012370 would be removed as traffic head- and tail-lights would be concealed within the tunnel. This would bring improvements to the westward, northward and eastward sightlines from the group. Traffic noise would be reduced and noise and air quality enhanced. The Bored Tunnel Extension would further improve longer distance views westwards from the northern parts of the asset group (AG19A, Normanton Down Barrows (north)), compared to the DCO Scheme.

8.3.28 The Bored Tunnel Extension would result in Large beneficial effects on AG19A Normanton Down Barrows (north), AG19B Normanton Down Barrows (central) and AG19C Normanton Down Barrows (south-western), whilst there would be a Moderate beneficial effect on AG19D Normanton Down Barrows (south-eastern). The Bored Tunnel Extension would result in a **Large beneficial effect** upon AG19 Normanton Down Barrows overall.

8.3.29 This compares to the DCO Scheme which would result in a Slight beneficial effect on AG19A Normanton Down Barrows (north), Large beneficial effects on AG19B Normanton Down Barrows (central) and AG19C Normanton Down Barrows (south-western), and a Moderate beneficial effect on AG19D Normanton Down Barrows (south-eastern) . The DCO Scheme would result in a Moderate beneficial effect upon AG19 Normanton Down Barrows overall.

Isolated and discrete heritage assets

8.3.30 For the Bored Tunnel Extension, the extended tunnel portal would emerge c.90m to the south-east of a **Bronze Age enclosure and bowl barrow 100m west of Longbarrow Crossroads (NHLE 1011048)**, and the approach road would be in deep cutting c.40m south of the asset. The A360 Northern Link Road, in shallow cutting, would be c.190m west of the asset.

8.3.31 As for the DCO Scheme, archaeological monitoring would be undertaken during removal of hardstanding material from the course of the existing A303 that bisects and severs the asset. Landscape mitigation for the A360 Northern Link Road and A360 roundabout, would include new hedge planting.

8.3.32 As for the DCO Scheme, it is assumed that the land containing the scheduled monument would remain in agricultural use. The course of the existing A303 surface road that bisects and severs the asset would be removed, a Major positive change. The A360 Northern Link Road to the west of the asset would result in a Negligible negative impact. The top of the southern elements of the mainline approach cutting may be visible until chalk grassland establishes, a Minor negative temporary impact.

8.3.33 There would be a Major positive impact on the setting of the asset due to the removal of traffic noise from the centre of the monument, reducing aural and visual impacts; severance will also be removed. However, traffic emerging from the tunnel portal to the south would introduce noise intrusion into the setting of the monument, leading to a Minor negative impact. Traffic on the A360 Northern Link Road would also introduce noise and visual impacts resulting in a Negligible negative impact. Overall, the Bored Tunnel Extension would result in a **Slight beneficial effect** on discrete asset NHLE 1011048 (derived from Major positive, Minor negative and Negligible negative changes to a Very High value asset). This would be the same as for the DCO Scheme (Slight beneficial).

8.3.34 For **bowl barrow (NHLE 1010832)**, the tunnel would be bored immediately north of the asset and c.20m below ground level, in comparison to c.10m below ground level in the DCO Scheme. There would be ground movement monitoring equipment during tunnel construction in the vicinity of the asset, comprising low impact, temporary and reversible surface elements. The existing A303 would be removed and converted to a restricted byway, and the land above the tunnel would remain in agricultural use. This is assessed as a Minor positive change. There would be a Minor positive impact on the setting of the asset due to the removal of visible traffic, traffic noise and enhanced air quality. The Bored Tunnel Extension would result in a **Moderate beneficial effect** on bowl barrow NHLE 1010832 overall compared to the current baseline conditions (derived from a Minor positive change to a Very High value asset).

8.3.35 In comparison, the DCO Scheme would result in a Slight Adverse effect on bowl barrow NHLE 1010832 due to effects on setting due to the proximity of the western portal and approach cutting.

8.3.36 For **NHLE 1012394, four bowl barrows 140m north of the A303 on Stonehenge Down,** the extended tunnel would be bored c.190m south of the monument and c.20m below ground level. The existing A303 would be removed and downgraded to a restricted byway, and the land above the tunnel will remain in agricultural use. Severance from monuments in the southern part of the WHS, including AG13 The Diamond Group and AG19

Normanton Down Barrows, would be removed. In contrast, with the DCO Scheme severance would be partially maintained due to the presence of the western approach cutting. With the Bored Tunnel Extension, the landscape would be reconnected, and sightlines would be uninterrupted. This is assessed as a Minor positive change. However, the negative effects of existing pylons and plantations would remain. There would be a Minor positive impact on the setting of the asset due to the removal of views of traffic, reduction of traffic noise and enhanced air quality. Overall, the Bored Tunnel Extension would result in a **Moderate beneficial effect** on discrete asset NHLE 1012394. This would be the same as for the DCO Scheme.

8.3.37 With the Bored Tunnel Extension, the extended tunnel would be bored c.170m north of **bowl barrow NHLE 1010831,** c.75m north of **pond barrow NHLE1010833 containing the 'Wilsford Shaft'** and c.260m north of **bowl barrow NHLE 1013812** and at a depth of c.20m below ground level. There would be ground movement monitoring equipment along the line of the tunnel, comprising low impact, temporary and reversible surface elements. The existing A303 would be removed and downgraded to a restricted byway, and the land above the tunnel would remain in agricultural use. The extended tunnel would remove severance from AG12 Winterbourne Stoke Crossroads Barrows and other monuments to the north. There would be a Minor positive impact on the setting of the assets due to the removal of views of traffic and vehicle lights, a reduction in traffic noise and enhanced air quality. Overall, the Bored Tunnel Extension would result in **Moderate beneficial effects** on discrete assets NHLE 1010831, NHLE 1010833 and NHLE 1013812.

8.3.38 In comparison the, DCO Scheme would result in a Neutral effect on discrete assets NHLE 1010831 and NHLE 1013812 (derived from Moderate negative change and Major positive change to Very High value assets) and a Slight adverse effect on discrete asset NHLE 1010833 (derived from Negligible negative change and Minor positive change to a Very High value asset).

8.3.39 For the series of barrows on Winterbourne Stoke Down (NHLE 1008949, NHLE 1008950, NHLE 1011039, NHLE 1011040, NHLE 1011041, NHLE 101144 and NHLE 1011043), with the Bored Tunnel Extension alternative, as with the DCO Scheme, the existing A360 would continue to sever relationships between bowl barrow NHLE 1008949 and the other barrows and dominate the barrows' setting. These heritage assets are located on a high plateau with views westwards across the Till valley and east towards Stonehenge. The new skewed Longbarrow junction to the west and the bored tunnel portal to the south-west would be hidden by the natural topography. There would be No change and a Neutral effect due to the Bored Tunnel Extension on the series of barrows on Winterbourne Stoke

Down (NHLE 1008949, NHLE 1008950, NHLE 1011039, NHLE 1011040, NHLE 1011041, NHLE 101144 and NHLE 1011043). This would be the same as for the DCO Scheme.

Impacts and effects on aspects of the WHS

8.3.40 In this Outline HIA, the assessment of impacts and effects on other aspects of the WHS follows the rationale set out in the Main HIA (Highways England 2018b, section 9.3). The impacts of the Bored Tunnel Extension on other aspects of the WHS are assessed as follows:

a) Impacts and effects of the Bored Tunnel Extension on **long barrow groupings** set around the Wilsford/Normanton dry valley would result in a Large beneficial effect compared to the current baseline conditions (derived from a Moderate positive impact on Very High value assets), as the extended bored tunnel would remove the sight and sound of traffic on the existing A303 and enhance physical landscape connectivity in the western part of the WHS. This compares to the DCO Scheme, which is assessed to have a Slight adverse effect (derived from both Moderate negative and Minor positive change on Very High value assets) as the western approach cutting would affect the physical relationships between the long barrow groupings in the western part of the WHS.

b) Effects on **archaeological remains** within the construction footprint for the Bored Tunnel Extension are assessed as ranging from Neutral to Moderate adverse (derived from No change to Major negative change to heritage assets ranging in value from Negligible to Medium). With an extended bored tunnel in the west of the WHS, impacts on archaeological remains of Early Neolithic to Early Bronze Age date potentially expressing OUV would be limited to the eastern portal and its approach cutting and Rollestone Corner within the WHS.

c) Both the Bored Tunnel Extension and the DCO Scheme would result in Large beneficial effects on **dark skies, night-time lighting and the ambience of the WHS** (derived from a Moderate positive impact on a Very High value aspect). The Bored Tunnel Extension would benefit the western extent of the WHS, removing all traffic lighting from this area and reducing lighting to the west, beyond the WHS boundary, generating a substantive beneficial effect on setting, ambience, dark skies and celestial axes.

d) The effects on **astronomical aspects** are considered in paragraphs 8.1.64 and 8.1.65 below (impacts and effects on Attributes of OUV: Attribute 4).

e) Regarding **biodiversity related to the conservation and character of the WHS**, as with the DCO Scheme, the territory boundaries of badger clans may alter following removal of the surface A303, which may result in the creation of new setts, changing the current distribution within barrows and potentially impacting on other barrows or areas. As with the DCO

Scheme, lichen communities at Stonehenge may slightly benefit from the removal of surface traffic, which produce dust and gaseous compounds.

f) As with the DCO Scheme, the **loss of the 'free' view of the Stones at Stonehenge and other monuments to motorists** is assessed as a Neutral effect (derived from Minor negative and Minor positive changes to a Very High value aspect). This is further analysed in the Main HIA, section 6.14.

g) As with the DCO Scheme, the Bored Tunnel Extension would result in a Slight beneficial effect on **tourism, spiritual aspects and cultural influences** (derived from Negligible positive changes to a Very High value aspect).

Impacts and effects on the Attributes which convey the OUV of the WHS, Integrity and Authenticity

8.3.41 This section considers the potential overall impacts and effects of the Bored Tunnel Extension on individual Attributes of OUV. The assessment below has taken into account both positive and negative impacts to arrive at an overall conclusion regarding the effect of the Bored Tunnel Extension alternative as a whole on individual Attributes of OUV, the Integrity and Authenticity of the WHS. In making this balanced judgement, a precautionary approach has been adopted so as to avoid overstating positive impacts and beneficial effects where these arise.

Attribute 1. Stonehenge itself as a globally famous and iconic monument

8.3.42 As with the DCO Scheme, the Bored Tunnel Extension would enable the removal of the existing surface A303, improving the aural and visual environment of the Stonehenge monument and providing it with an uncluttered and respectful setting, that better reflects the iconic status of the monument and its cultural significance within the WHS. In both the DCO Scheme and the Bored Tunnel Extension, placing the road in tunnel provides the opportunity to reconnect it physically and visually with the wider WHS to the south. As with the DCO Scheme, it is anticipated that the Bored Tunnel Extension would have a Major positive impact on this Attribute of OUV, resulting in a **Very Large beneficial effect**.

Attribute 2. The physical remains of the Neolithic and Bronze Age funerary and ceremonial monuments and associated sites.

8.3.43 With the Bored Tunnel Extension alternative, the route would be in a bored tunnel through much of the WHS; impacts on archaeological remains within the WHS would be limited to the eastern portal and its approaches, and at Rollestone Corner. Due to the continued negative impacts at these locations within the WHS, overall, it is anticipated that, as with the DCO Scheme, the

Bored Tunnel Extension alternative would have a Negligible negative impact on this Attribute of OUV and a **Slight adverse effect**.

Attribute 3. The siting of Neolithic and Bronze Age funerary and ceremonial sites and monuments in relation to the landscape

8.3.44 As with the DCO Scheme, the Bored Tunnel Extension alternative would enable the removal of the surface A303 across much of the WHS and the physical reconnection of a number of significant monuments to the wider landscape, including AG22 Stonehenge, the AG19 Normanton Down Barrows, AG26 King Barrows (Old and New King Barrows) and numerous barrows to the south of the A303. The removal of the surface road and the associated traffic would also improve people's ability to appreciate and understand the visual and spatial connections between the various monuments and the wider topographic landscape, in particular the relationships with the rising ground to the south of Stonehenge around Normanton Down. Asset Group AG27 The Avenue would also be reconnected where it is currently severed by the A303. These are benefits for this Attribute of OUV, common to both the DCO Scheme and the Bored Tunnel Extension alternative.

8.3.45 As with the DCO Scheme, at the eastern end of the tunnel, the new approach road and eastern portal would be visible features in the landscape and would affect visual relationships between monuments and the landscape. In particular, in views towards the AG31 Countess Farm Barrows, the portal and approach road would introduce major new elements of modern infrastructure that would disrupt the appreciation of the landscape relationship between the barrows. The new portal and dual carriageway would be visible and prominent features in the landscape, although a canopy and the placing of the eastern portal within a dry valley would help to conceal the portal entrance.

8.3.46 Conversely, in both the DCO Scheme and the Bored Tunnel Extension alternative the removal of the A303 at the southern end of King Barrow Ridge (AG26) would improve physical connectivity along the ridge, enabling the physical reconnection of the AG26 King Barrows (Old and New King Barrows) to the wider landscape and associated monuments to the south in both the DCO Scheme and the Bored Tunnel Extension alternative. As with the DCO Scheme, to the west, between King Barrow Ridge and Normanton Down, the siting of monuments and monument groups in relation to the landscape would be enhanced with the removal of the A303, enabling safe access between the north and south parts of the WHS using PRoWs and permissive open access land.

8.3.47 With the Bored Tunnel Extension, the removal of the A303 in the western part of the WHS would benefit the setting and appreciation of the relationships between monuments and the landscape including, amongst others, the AG12 Winterbourne Stoke Crossroads Barrows, AG13 The Diamond Group and the AG19 Normanton Down Barrows, and the concentration of long barrows associated with the Wilsford/Normanton dry valley complex.

8.3.48 Overall, it is anticipated that the Bored Tunnel Extension alternative would have a Negligible positive impact on this Attribute of OUV, resulting in a **Slight beneficial effect**.

8.3.49 In comparison, overall, it was anticipated that the DCO Scheme would have a Negligible negative impact on this Attribute of OUV resulting in a Slight adverse effect, as the western approach cutting within the WHS would affect the relationships between monuments and the landscape in the western part of the WHS.

Attribute 4. The design of Neolithic and Bronze Age funerary and ceremonial sites and monuments in relation to the skies and astronomy

8.3.50 As with the DCO Scheme, the Bored Tunnel Extension alternative would enable the removal of the existing A303 to the south of Stonehenge, particularly where it crosses the winter solstice sunset alignment, and would benefit this Attribute of OUV through the removal of traffic and modern road infrastructure from views towards the winter solstice sunset. There would be no visibility of any infrastructure in the backdrop of the horizon sector containing the winter solstice sunset alignment. There would be no impact upon the midwinter sunrise solstice alignment of the Durrington Walls Southern Circle Avenue looking down to the south-east towards Countess East.

8.3.51 Overall, as with the DCO Scheme, it is anticipated that the Bored Tunnel Extension alternative would have a Moderate positive impact on this Attribute of OUV, resulting in a **Large beneficial effect**.

Attribute 5. The siting of Neolithic and Bronze Age funerary and ceremonial sites and monuments in relation to each other

8.3.52 As with the DCO Scheme, the removal of the surface A303 would be a benefit for many monuments, in terms of removing visual clutter and distraction from sightlines between different groups of monuments, and also aiding the physical reconnection between monuments. Common to both the DCO Scheme and the Bored Tunnel Extension alternative would be improvements to the visual connections between the AG19 Normanton

Down Barrows and monuments such as AG22 Stonehenge, the AG26 King Barrows and the AG18 Cursus Barrows (West), and improvements in visual relationships between Stonehenge and a range of monuments to the south.

8.3.53 The removal of the existing A303, in both the DCO Scheme and the Bored Tunnel Extension alternative, provides the opportunity to enable physical access between Asset Groups, for example between major barrow groups such as the AG26 King Barrows (Old and New King Barrows) and the AG19 Normanton Down Barrows, along AG27 The Avenue, and between the dispersed barrows and other ritual / ceremonial sites in the central area of the WHS. These physical connections are an important aspect of this Attribute alongside the visual connections between different barrow groups and associated monuments including henges and cursuses.

8.3.54 With the Bored Tunnel Extension alternative, the extended bored tunnel section in the western part of the WHS would benefit the physical relationships and sight-lines between the AG19 Normanton Down Barrows, the AG12 Winterbourne Stoke Crossroads Barrows and the AG13 Diamond Group, as well as visual and physical relationships between other dispersed barrows and associated monuments. These include the relationships between the concentration of long barrows associated with the Wilsford/Normanton dry valley complex.

8.3.55 In both the DCO Scheme and the Bored Tunnel Extension, however, there would be some impacts on visual relationships between barrow groups and isolated barrows near the eastern portal, with views from the AG31 Countess Farm Barrows towards the AG30 Avenue Barrows and the AG26 King Barrows (Old and New King Barrows) being affected by the presence of the eastern portal in the foreground. The views would not, however, be fundamentally altered.

8.3.56 For the Bored Tunnel Extension, the overall assessment of impacts for this Attribute requires a balanced judgement. The beneficial effects are considered to outweigh the adverse effects in terms of this Attribute. Overall, it is anticipated that the Bored Tunnel Extension alternative would have a Minor positive impact on this Attribute of OUV, resulting in a **Moderate beneficial effect**.

8.3.57 In comparison, overall, it was anticipated that the DCO Scheme would have a Negligible positive impact on this Attribute of OUV, resulting in a Slight beneficial effect, as the western approach cutting would affect the relationships between monuments in the western part of the WHS.

Attribute 6. The disposition, physical remains and settings of the key Neolithic and Bronze Age funerary, ceremonial and other monuments and sites of the period, which together form a landscape without parallel

8.3.58 As with the DCO Scheme, placing the A303 in a tunnel would improve the setting of numerous assets within the WHS including (to varying degrees) AG22 Stonehenge, AG27 The Avenue, AG23 The Greater Cursus and numerous barrow groups and other related features. The removal of the existing surface A303 would improve the setting of these and other monuments and enable visitors to better appreciate their disposition and relationships. These are significant benefits for the WHS.

8.3.59 With the Bored Tunnel Extension, the settings of the AG19 Normanton Down Barrows, the AG12 Winterbourne Stoke Crossroads Barrows, AG13 The Diamond Group and several discrete Neolithic and Bronze Age barrows in the western part of the WHS would be improved. The relationships between the concentration of long barrows associated with the Wilsford/Normanton dry valley complex would also benefit. In both the DCO Scheme and the Bored Tunnel Extension alternative, construction of the eastern portal and approach cutting within the WHS would, however, have some adverse effects on the setting of a number of assets including AG31 Countess Farm Barrows.

8.3.60 The overall assessment of impacts for this Attribute requires a balanced judgement. The beneficial effects of the Bored Tunnel Extension alternative are considered to outweigh the adverse effects in terms of this Attribute. Overall, it is anticipated that the Bored Tunnel Extension alternative would have a Minor positive impact on this Attribute of OUV, resulting in a **Moderate beneficial effect**.

8.3.61 In comparison, overall, it was anticipated that the DCO Scheme would have a Negligible positive impact on this Attribute of OUV resulting in a Slight beneficial effect, as the western approach cutting would affect the relationships between monuments in the western part of the WHS.

Attribute 7. The influence of the remains of the Neolithic and Bronze Age funerary and ceremonial monuments and their landscape setting on architects, artists, historians, archaeologists and others

8.3.62 Overall, the existing A303 has an adverse effect on this Attribute. With both the DCO Scheme and the Bored Tunnel Extension alternative, removing the A303 from the key views which have inspired artists and others over centuries, including present-day visitors and those for whom the property has spiritual associations, would be a beneficial change. On the other hand, the view of Stonehenge from vehicles descending from King Barrow Ridge to

Stonehenge Bottom is highly appreciated by many; although this view would no longer be available to motorists, visitors would still be able to appreciate it on foot, by cycle or on horseback, by using the new A303 restricted byway or other paths in the vicinity.

8.3.63 With the Bored Tunnel Extension alternative, the appreciation of the landscape setting in the western part of the World Heritage would be enhanced, bringing additional benefits to visitors.

8.3.64 Overall, it is anticipated that the Bored Tunnel Extension alternative would have a Minor positive impact on this Attribute of OUV, resulting in a **Moderate beneficial effect**.

8.3.65 In comparison, overall, it was anticipated that the DCO Scheme would have a Negligible positive impact on this Attribute of OUV resulting in a Slight beneficial effect, as the western approach cutting would affect appreciation of landscape setting in the western part of the WHS.

Impacts and effects of the Bored Tunnel Extension on the Integrity of the WHS

8.3.66 In both the DCO Scheme and the Bored Tunnel Extension alternative the removal of the existing surface A303would address a longstanding threat to the Integrity of the WHS and would provide benefits for the Integrity of the site. Removing a substantial length of the existing surface road would improve the ability to access all parts of the World Heritage property and would reduce aural and visual impact where the road would be in a tunnel. This would be a beneficial change. Benefits for both the DCO Scheme and the Bored Tunnel Extension include:

a) The removal of extensive visual and aural intrusion from road traffic and associated infrastructure across many parts of the WHS including around AG22 Stonehenge itself.

b) The reconnection of AG27 The Avenue, which would enhance the integrity of an important asset.

c) The removal of severance from the AG26 King Barrows (Old and New King Barrows) and the associated barrow groups to the south.

d) The removal of traffic from immediately adjacent to AG12 Winterbourne Stoke Crossroads Barrows.

e) The restoration of sightlines and connectivity between AG13 The Diamond Group, AG12 Winterbourne Stoke Crossroads Barrows and the AG19 Normanton Down Barrows.

f) Enabling the reconnection of the north and south parts of the WHS, to create a more complete landscape that better represents the cultural

heritage value of the WHS and creates the opportunity for visitors to fully engage with and explore key areas of the WHS south of the existing A303 using PRoW.

8.3.67 The Bored Tunnel Extension would further benefit the integrity of the WHS in its western part, by the use of a bored tunnel construction method. However,construction of the eastern portal and approach cutting would have an adverse impact on the integrity of the WHS.

8.3.68 Outside the WHS there may be some loss of archaeological remains associated with key periods represented in the WHS for both the DCO Scheme and the Bored Tunnel Extension alternative. The route may also affect the settings of non-designated archaeological assets within and beyond the boundary of the WHS.

8.3.69 Overall, it is anticipated that the Bored Tunnel Extension alternative would have a Minor positive impact on the Integrity of the WHS, resulting in a **Moderate beneficial effect**.

8.3.70 In comparison, overall, it was anticipated that the DCO Scheme would have a Negligible positive impact on the Integrity of the WHS, resulting in a Slight beneficial effect.

Impacts and effects of the Bored Tunnel Extension on the Authenticity of the WHS

8.3.71 In relation to the Stonehenge, Avebury and Associated Sites WHS, the primary factors that express its Authenticity are considered to relate to:

a) Form and design – the form and design of assets and the inter-relationships between assets.

b) Materials and substance – the materials used to construct assets and the continuing conservation of those materials.

c) Location and setting – the relationships between assets and the landscape and the horizon-based celestial/astronomical alignment phenomena.

8.3.72 In terms of the **form and design of assets and the inter-relationships** between those assets, as with the DCO Scheme, the Bored Tunnel Extension alternative would avoid physical impacts on assets that contribute to the OUV of the WHS as presently known.

8.3.73 As with the DCO Scheme, the Bored Tunnel Extension alternative as a whole would have a mixture of positive and negative impacts on the designed relationships between assets; it would therefore both strengthen and degrade this aspect of Authenticity.

8.3.74 With regards to **materials and substance**, the impact of the DCO Scheme and the Bored Tunnel Extension alternative on the materials used to construct assets and the continuing conservation of those materials is assessed to be relatively limited. The existing A303 is currently a dominant feature in many views of the WHS with an adverse impact on the setting of the property. Both its visual and aural impacts are disruptive to the spirit and feeling of the property.

8.3.75 The **location and setting of the WHS** includes the many and varied relationships between assets, between assets and the landscape and the horizon-based celestial/astronomical alignment phenomena. There would be a distinct mix of positive and negative impacts with both the DCO Scheme and the Bored Tunnel Extension alternative, with areas of the WHS seeing a marked improvement in the experience and display of these aspects of Authenticity, such as the western part of the WHS with the extended bored tunnel, and the Eastern Portal and approaches still experiencing a negative impact.

8.3.76 Overall, it is anticipated that the Bored Tunnel Extension would have a Minor Positive impact on the Authenticity of the WHS, resulting in a **Moderate beneficial effect**.

8.3.77 In comparison, overall, it was anticipated that the DCO Scheme would have a Negligible positive impact on the Authenticity of the WHS, resulting in a Slight beneficial effect.

Impacts and effects on the overall OUV of the Stonehenge component of the WHS

8.3.78 As with the DCO Scheme, elements of the Bored Tunnel Extension alternative that would be beneficial comprise:

- placing the A303 road in a tunnel across the WHS;
- removing the existing Longbarrow roundabout;
- reuniting the Avenue where it is truncated by the existing A303;
- realigning the A303 and A360 junction away from the AG12 Winterbourne Stoke Crossroads Barrows;
- downgrading the A303 and part of the A360 to restricted byways; and
- improving junctions which would alleviate the impact of traffic congestion in the WHS.

8.3.79 These aspects, common to both the DCO Scheme and the Bored Tunnel Extension alternative, would reduce the current adverse impacts from the existing A303 and A360 on the WHS.

8.3.80 With the Bored Tunnel Extension, placing the new road in an extended tunnel would have further beneficial effects, enhancing the landscape over an extensive area of the WHS, benefitting the Integrity and Authenticity of the OUV of the WHS.

8.3.81 However, adverse impacts would persist with the Bored Tunnel Extension, as with the DCO Scheme, in the eastern part of the WHS landscape, in the vicinity of the Eastern Portal, eastern approach road, and the Countess roundabout and flyover. The alignment here has been selected to avoid known monuments and to follow a shallow dry valley. Its topographical positioning within the dry valley would conceal the new highway infrastructure in the landscape and the sight and sound of high-speed traffic in views across this part of the WHS. The approach road would require a short length of new cutting to access the existing portal but would re-use approximately 1km of the existing A303 two-lane dual carriageway, with minimal new impacts. The existing A303 already presents an intrusion in this part of the WHS. The concealment of the new infrastructure in a cutting would minimise adverse effects upon the setting of adjacent monuments and Asset Groups. The Countess roundabout and flyover would be constructed within the existing highway footprint and, once replacement planting screening has established, would be integrated into the landscape east of the WHS. It is not assessed that this screening would have an intrusive effect on the setting of the WHS or its Attributes of OUV.

8.3.82 Taking into account both beneficial and adverse effects,the significance of effect of the Bored Tunnel Extension alternative on the overall OUV of the Stonehenge component of the Stonehenge, Avebury and Associated Sites WHS, taking into account the beneficial and adverse changes on the Attributes of OUV as set out above, is assessed as **Moderate beneficial**.

8.3.83 This compares to a Slight beneficial significance of effect for the DCO Scheme, taking into account the beneficial and adverse changes on the Attributes of OUV.

Table 3. Summary of assessed impacts and effects of the existing A303, anticipated impacts and effects of the DCO Scheme and the Bored Tunnel Extension on Asset Groups, designated isolated and discrete assets conveying Attributes of OUV in the western part of the WHS

Asset Groups / designated isolated and discrete assets	Attributes	DCO Scheme	Bored Tunnel Extension	Existing A303
AG12 Winterbourne Stoke Crossroads Barrows	2, 3, 5, 6, 7	Moderate beneficial	Large beneficial	Large adverse
AG13 The Diamond Barrows	2, 3, 5, 6, 7	Slight adverse	Slight beneficial	Large adverse
AG16 North Kite Enclosure and Lake Barrows	2, 3, 5, 6, 7	Slight beneficial	Slight beneficial	Moderate adverse
AG17 Barrow West of Stonehenge	2, 3, 5, 6, 7	Moderate beneficial	Moderate beneficial	Large adverse
AG19 Normanton Down Barrows	2, 3, 5, 4, 6, 7	Moderate beneficial	Large beneficial	Large adverse
AG19A Normanton Down Barrows (north)		Slight beneficial	Large beneficial	Large adverse
AG19B Normanton Down Barrows (central)		Large beneficial	Large beneficial	Large adverse
AG19C Normanton Down Barrows (south-western)		Large beneficial	Large beneficial	Large adverse
AG19D Normanton Down Barrows (south-eastern)		Moderate beneficial	Moderate beneficial	Large adverse
NHLE 1011048 Bronze Age enclosure and bowl barrow 100m west of Longbarrow Cross Roads on Winterbourne Stoke Down	2, 3, 5, 6	Slight beneficial	Slight beneficial	Large adverse
NHLE 1012394 Four bowl barrows 140m north of the A303 on Stonehenge Down	2, 3, 5, 6	Moderate beneficial	Moderate beneficial	Large adverse
NHLE 1010831 Bowl barrow 400m west of Normanton Gorse	2, 3, 5, 6	Neutral	Moderate beneficial	Moderate adverse
NHLE 1010832 Bowl barrow south of the A303 and north-west of Normanton Gorse	2, 3, 5, 6	Slight adverse	Moderate beneficial	Large adverse
NHLE1010833 Pond barrow south of the A303 and 400m west of Normanton Gorse containing the 'Wilsford Shaft'	2, 3, 5, 6	Slight adverse	Moderate beneficial	Large adverse
NHLE 1013812 Bowl barrow 350m southwest of Normanton Gorse	2, 3, 5, 6	Neutral	Moderate beneficial	Moderate adverse
Barrows on Winterbourne Stoke Down (NHLE 1008949, NHLE 1008950, NHLE 1011039, NHLE 1011040, NHLE 1011041, NHLE 101144, NHLE 1011043)	2, 3, 5, 6	Neutral	Neutral	Moderate adverse

9 Evaluation of Overall Impact and Significance of Effect on the OUV of the WHS

9.1 Introduction

9.1.1 Table 4 provides a summary of the anticipated significance of effect of the Bored Tunnel Extension alternative on the Attributes of OUV, Integrity and Authenticity of the WHS. The assessment of the existing A303 surface route and the DCO Scheme as reported in the Main HIA (Highways England 2018b) are also provided for comparison.

9.2 Existing A303 surface route

9.2.1 The existing A303 surface route has negative impacts on Attributes of OUV, ranging from Negligible to Major negative, resulting in effects ranging from Slight to Large adverse.

9.2.2 Impacts on Integrity are assessed as Major negative, resulting in a Large adverse significance of effect.

9.2.3 Impacts on Authenticity are assessed as Negligible negative, resulting in a Slight adverse significance of effect.

9.2.4 Overall, the effect of the existing A303 surface route is assessed as Large adverse on the OUV of the WHS as a whole.

9.3 DCO Scheme

9.3.1 The DCO Scheme has both positive and negative impacts on Attributes of OUV, ranging from Negligible negative to Major positive, resulting in effects ranging from Slight adverse to Very Large beneficial.

9.3.2 Impacts on Integrity are assessed as Negligible positive, resulting in a Slight beneficial significance of effect.

9.3.3 Impacts on Authenticity are assessed as Negligible positive, resulting in a Slight beneficial significance of effect.

9.3.4 Overall, the effect of the DCO Scheme is assessed as Slight beneficial on the OUV of the WHS as a whole.

9.4 Bored Tunnel Extension to chainage 6+150

9.4.1 The Bored Tunnel Extension has both positive and negative impacts on Attributes of OUV, ranging from Negligible negative to Major positive, resulting in effects ranging from Slight adverse to Very Large beneficial.

9.4.2 Impacts on Integrity are assessed as Minor positive, resulting in a Moderate beneficial significance of effect.

9.4.3 Impacts on Authenticity are assessed as Minor positive, resulting in a Moderate beneficial significance of effect.

9.4.4 Overall, the effect of the Bored Tunnel Extension alternative is assessed as Moderate beneficial on the OUV of the WHS as a whole.

9.5 Conclusion

9.5.1 In conclusion, the Bored Tunnel Extension alternative would therefore result in a **Moderate beneficial effect**; in comparison, the DCO Scheme would result in a Slight beneficial effect.

Table 4. Summary of assessment of significance of effects of existing A303, anticipated significance of effects of DCO Scheme and the Bored Tunnel Extension alternative on Attributes of OUV, Integrity and Authenticity

Attributes of Outstanding Universal Value	Impact of DCO Scheme	Effect of DCO Scheme	Impact of the Bored Tunnel Extension	Effect of the Bored Tunnel Extension	Impact of existing A303	Effect of existing A303
1. Stonehenge itself as a globally famous and iconic monument	Major positive change	Very Large beneficial	Major positive change	Very Large beneficial	Moderate negative	Large adverse
2. The physical remains of the Neolithic and Bronze Age funerary and ceremonial monuments and associated sites	Negligible negative change	Slight adverse	Negligible negative change	Slight adverse*	Moderate negative	Large adverse
3. The siting of Neolithic and Bronze Age funerary and ceremonial sites and monuments in relation to the landscape	Negligible negative change	Slight adverse	Negligible positive change	Slight beneficial	Minor negative	moderate adverse
4. The design of Neolithic and Bronze Age funerary and ceremonial sites and monuments in relation to the skies and astronomy	Moderate positive change	Large beneficial	Moderate positive change	Large beneficial	Minor negative	moderate adverse
5. The siting of Neolithic and Bronze Age funerary and ceremonial sites and monuments in relation to each other	Negligible positive change	Slight beneficial	Slight positive change	Moderate beneficial	Moderate negative	Large adverse
6. The disposition, physical remains and settings of the key Neolithic and Bronze Age funerary, ceremonial and other monuments and sites of the period, which together form a landscape without parallel	Negligible positive change	Slight beneficial	Slight positive change	Moderate beneficial	Moderate negative	Large adverse
7. The influence of the remains of the Neolithic and Bronze Age funerary and ceremonial monuments and their landscape setting on architects, artists, historians, archaeologists and others	Negligible positive change	Slight beneficial	Slight positive change	Moderate beneficial	Negligible negative	Slight adverse
Integrity	Negligible positive change	Slight beneficial	Slight positive change	Moderate beneficial	Major negative	Large adverse
Authenticity	Negligible positive change	Slight beneficial	Slight positive change	Moderate beneficial	Negligible negative	Slight adverse
Overall assessment	**DCO Scheme**	**Slight beneficial**	**The Bored Tunnel Extension**	**Moderate beneficial**	**Existing A303**	**Large adverse**

* slight adverse effects persist for the Bored Tunnel Extension in relation to Attribute 2 due to the impacts of the Eastern Portal and its approach cutting, despite the more extensive benefits at the Western Portal for The Bored Tunnel Extension alternative.

10 Cumulative Impact Assessment

10.1.1 The cumulative assessment in this Outline HIA considers two forms of cumulative impact in relation to the cultural heritage resource, comprising:

a) Combinations of impacts, identified within the previous 2018 ES and subsequent 2020 ES addendum, which are considered likely to result in a new or different likely significant effect, or an effect of greater significance than any one of the impacts on their own and in combination with the alternative; and

b) Impacts which, in combination with impacts associated with other proposed developments, identified in the 2018 Main HIA and Redeterminaiton-1.4 – Environmental Information (National Highways 2022c), are likely to result in an effect of greater significance, or a new or different likely significant effect, than the alternative in isolation.

10.1.2 It is assessed that the Bored Tunnel Extension alternative would not result in any changes to those assessments already undertaken, as set out in (a) and (b) above.

11 Summary and Conclusions

11.1.1 In accordance with the 2011 ICOMOS HIA Guidance, this Outline HIA:

a) Identifies heritage potentially at risk and its contribution to the OUV of the property;

b) Identifies how change or development will impact on OUV, positively or negatively;

c) Identifies how change or development will impact on Integrity and Authenticity, positively or negatively; and

d) Considers how adverse impacts of the Bored Tunnel Extension alternative might be mitigated.

11.2 World Heritage Convention

11.2.1 The Convention Concerning the Protection of the World Cultural and Natural Heritage (the World Heritage Convention) is the principal global instrument for the protection of cultural and natural heritage. The UK ratified the Convention on 29 May 1984. Article 4 of the Convention sets out the duties of State Parties:

> '*Each State Party to this Convention recognizes that the duty of ensuring the identification, protection, conservation, presentation and transmission to future generations of the cultural and natural heritage referred to in Articles 1 and 2 and situated on its territory, belongs primarily to that State. It will do all it can to this end, to the utmost of its own resources and, where appropriate, with any international assistance and co-operation, in particular, financial, artistic, scientific and technical, which it may be able to obtain*.' (UNESCO 1972).

11.3 Operational Guidelines for the Implementation of the World Heritage Convention

11.3.1 The Operational Guidelines note that 'each nominated property should have an appropriate management plan or other documented management system which must specify how the Outstanding Universal Value of a property should be preserved, preferably through participatory means.' (UNESCO 2021, para. 108). 'States Parties are responsible for implementing effective management activities for a World Heritage property. State Parties should do so in close collaboration with property managers, the agency with management authority and other partners, and stakeholders in property management.' (ibid., para. 117).

11.3.2 In England, these commitments are fulfilled through the statutory planning system, designation of specific assets within World Heritage properties and the development of WHS Management Plans.

11.3.3 The 2015 WHS Management Plan (Simmonds and Thomas 2015) is in place to protect and manage the property as required by the World Heritage Convention. It deals with policy aspects, legal status and protective measures and with the practicalities of day-to-day administration and management.

11.4 Alignment with WHS Management Plan vision, aims and policies

11.4.1 The ICOMOS HIA Guidance notes that 'Conservation policies embedded in the management system may also be used as a measure to assess potential adverse impacts' (ICOMOS 2011, 2) and that 'Proposals should be tested against existing policy frameworks and the management plan for the property and surrounding area' (ibid., 10).

11.4.2 One of the priorities of the 2015 WHS Management Plan is to 'reduce the dominance and negative impact of roads and traffic and ensure any improvements to the A303 support this' (Simmonds and Thomas 2015, 8). The design of both the DCO Scheme and the Bored Tunnel Extension alternative have been developed with consideration to relevant aims and policies set out in the 2015 WHS Management Plan.

11.4.3 This section considers the ways in which the Bored Tunnel Extension alternative delivers against the aims and policy set out in the 2015 WHS Management Plan. Only those aims and policies considered to have the potential to be affected by the alternative have been considered. Aims and policies have been selected in accordance with the advice that the Stonehenge and Avebury World Heritage Site Coordination Unit provided with regard to the DCO Scheme.

Aim 1: The Management Plan will be endorsed by those bodies and individuals responsible for its implementation as the framework for long-term detailed decision-making on the protection and enhancement of the WHS and the maintenance of its Outstanding Universal Value (OUV). Its aims and policies should be incorporated in relevant planning guidance and policies.

– Policy 1a – Government departments, agencies and other statutory bodies responsible for making and implementing national policies and for undertaking activities that may impact on the WHS and its environs should recognise the importance of the WHS and its need for special treatment and a unified approach to sustain its OUV.

– Policy 1d – Development which would impact adversely on the WHS, its setting and its attributes of OUV should not be permitted.

– Policy 1e – Minimise light pollution to avoid adverse impacts on the WHS, its setting and its attributes of OUV.

11.4.4 In line with Policy 1a, identification of the preferred route and development of the DCO Scheme design has been heritage led, and the protection and enhancement of the WHS is one of the Client Scheme Requirements (CSRs) for the project. The DCO Scheme design has been developed in line with Policies 1d and 1e to avoid and minimise adverse impacts on the OUV of the WHS; to maximise opportunities for enhancement, in particular with respect to accessibility; and to minimise light pollution relating to the A303 Scheme and car head- and tail-lights.

11.4.5 The construction of the Bored Tunnel Extension alternative would further reduce traffic impacts on the WHS, its setting and its Attributes of OUV, relocating Longbarrow roundabout further to the west and hiding the route and traffic within the western part of the WHS in a longer bored tunnel.

Aim 3: Sustain the OUV of the WHS through the conservation and enhancement of the Site and its attributes of OUV.

– Policy 3a – Manage the WHS to protect the physical remains which contribute to its attributes of OUV and improve their condition.

– Policy 3c – Maintain and enhance the setting of monuments and sites in the landscape and their inter-relationships and astronomical alignments with particular attention given to achieving an appropriate landscape setting for the monuments and the WHS itself.

– Policy 3d – Improve the WHS landscape by the removal, redesign or screening of existing intrusive structures such as power lines, fences and unsightly buildings where opportunities arise.

– Policy 3f – Encourage land management activities and measures to maximise the protection of archaeological monuments and sites as well as their settings, and the setting of the WHS itself.

– Policy 3g – Maintain, enhance and extend existing areas of permanent grassland where appropriate.

– Policy 3i – Sustain and enhance the attributes of OUV through woodland management while taking into account the WHS's ecological and landscape values.

11.4.6 The DCO Scheme seeks to protect and enhance the WHS and its Attributes of OUV through removal of the existing surface A303 and placing the road in a tunnel over 3km of its length, and through relocation of the Longbarrow junction outside the WHS, in line with Policies 3a, 3c and 3d. The DCO

Scheme would provide opportunities for enhancement in line with Policies 3f, 3g and 3i.

11.4.7 The Bored Tunnel Extension alternative would further benefit the western part of the WHS, with the western elements of the DCO Scheme within the WHS being placed in a longer bored tunnel and Longbarrow junction relocated further to the west. Land above the longer tunnel would remain in agricultural use, however, reducing opportunities for enhancement in line with Policies 3c, 3f and 3g.

Aim 4: Optimise physical and intellectual access to the WHS for a range of visitors and realise its social and economic benefits while at the same time protecting the WHS and its attributes of OUV.

– Policy 4a – Management of visitors to the WHS should be exemplary and follow relevant national and international guidance on sustainable tourism.

– Policy 4b – Spread the economic benefits from tourism related to the WHS throughout the wider community.

– Policy 4c – Encourage access and circulation to key archaeological sites within the WHS landscape. Maintain appropriate arrangements for managed open access on foot (taking into account archaeological, ecological and community sensitivities) to increase public awareness and enjoyment.

11.4.8 The DCO Scheme would reconnect the WHS landscape, currently severed by the existing surface A303, in line with Policies 4a, 4b and 4c. This would provide the opportunity to widen public access and circulation to key archaeological sites within the wider WHS landscape (taking into account archaeological, ecological and community sensitivities) and to increase public awareness and enjoyment.

11.4.9 As with the DCO Scheme, the Bored Tunnel Extension alternative would benefit access, in line with Policy 4c, allowing access between the AG12 Winterbourne Stoke Crossroads Barrows, AG13 The Diamond Group, the AG19 Normanton Down Barrows and AG22 Stonehenge along new restricted byways.

Aim 5: Improve the interpretation of the WHS to increase understanding and enjoyment of its special characteristics and maximise its educational potential. Engage the local community in the stewardship and management of the WHS.

– Policy 5a – Improve the interpretation both on and off site to enhance enjoyment and appreciation of the WHS.

11.4.10 The DCO Scheme would deliver opportunities for improved interpretation through both improved accessibility and through direct engagement with the local community during the delivery of the DCO Scheme and through legacy and benefits projects.

11.4.11 It is assumed that the same range of delivery, legacy and benefits projects would accompany the construction and operation of the Bored Tunnel Extension alternative, so similar benefits would ensue.

Aim 6: Reduce significantly the negative impacts of roads and traffic on the WHS and its attributes of OUV and increase sustainable access to the WHS.

– Policy 6a – Identify and implement measures to reduce the negative impacts of roads, traffic and parking on the WHS and to improve road safety and the ease and confidence with which residents and visitors can explore the WHS.

– Policy 6b – Manage vehicular access to byways within the WHS to avoid damage to archaeology, improve safety and encourage exploration of the landscape on foot whilst maintaining access for emergency, operational and farm vehicles and landowners.

– Policy 6c – Take measures through sustainable transport planning to encourage access to the WHS other than by car.

11.4.12 The DCO Scheme would substantially reduce the negative impacts of roads, traffic and parking on the WHS in line with Policy 6a through removal of trunk road traffic from much of the landscape and downgrading of the existing A303. The DCO Scheme would encourage exploration of the landscape on foot through improved accessibility in line with Policy 6b. The downgrading of the A303 through the WHS and redundant sections of the A360 to a restricted byway, together with the introduction of new rights of way for NMUs would help to deliver Policies 6b and 6c.

11.4.13 Although the DCO Scheme would introduce significant elements of infrastructure within the WHS, the location and design of infrastructure has been carefully selected to limit intrusion in the landscape in order to protect the WHS and its OUV.

11.4.14 The Bored Tunnel Extension alternative would further reduce the negative impacts of roads and traffic on the WHS, in line with Policy 6a, by placing the road in a longer bored tunnel throughout the western part of the WHS.

Aim 7 – Encourage and promote sustainable research to improve understanding of the archaeological, historic and environmental value of the WHS necessary for its appropriate management. Maximise the public benefit of this research.

– Policy 7a – Encourage sustainable archaeological research of the highest quality in the WHS, informed by the WHS Research Framework.

11.4.15 All archaeological work conducted in connection with the DCO Scheme route identification, design and impact assessment and mitigation would deliver archaeological research informed by the WHS Research Framework, in line with Policy 7a. Archaeological mitigation work would be accompanied by post-excavation assessment, publication, dissemination and public outreach.

11.4.16 The Bored Tunnel Extension would greatly reduce the extent of archaeological mitigation required within the WHS. Where archaeological impacts would occur, similar archaeological mitigation measures to the DCO Scheme would be undertaken for the Bored Tunnel Extension alternative, in accordance with the DAMS (Highways England 2020b), with similar research dividends.

11.5 Effects on the Outstanding Universal Value of the WHS

Existing A303

11.5.1 As reported in the Main HIA, the existing A303 surface road presents significant effects comprising:

a) Large adverse effects assessed upon the Stonehenge monument (Attribute 1), the physical remains of the Neolithic and Bronze Age funerary and ceremonial monuments and associated sites (Attribute 2), the siting of Neolithic and Bronze Age funerary and ceremonial sites and monuments in relation to each other (Attribute 5) and the disposition, physical remains and settings of the key Neolithic and Bronze Age funerary, ceremonial and other monuments and sites of the period, which together form a landscape without parallel (Attribute 6).

b) Moderate adverse effects assessed on the siting of Neolithic and Bronze Age funerary and ceremonial sites and monuments in relation to the landscape (Attribute 3) and on the design of Neolithic and Bronze Age funerary and ceremonial sites and monuments in relation to the skies and astronomy (Attribute 4).

c) Slight adverse effects assessed on the influence of the remains of the Neolithic and Bronze Age funerary and ceremonial monuments and their landscape setting on architects, artists, historians, archaeologists and others (Attribute 7).

d) A Large adverse effect assessed on integrity, due to severance of landscape connectivity, sightlines and physically impinging upon the fabric of monuments.

e) A Slight adverse effect assessed on authenticity, due to impacts on physical and visual links between monuments as well as the solstitial

relationship between Stonehenge and the Sun Barrow. The existing A303 also intrudes on the appreciation of the WHS and its OUV (volume and noise of road traffic).

11.5.2 Overall, the existing A303 surface road results in a Large adverse effect on the OUV of the WHS as a whole.

DCO Scheme

11.5.3 The DCO Scheme would bring substantial benefits to large parts of the WHS, in particular the tunnel section where Very Large beneficial effects would be experienced by Stonehenge itself (Attribute 1) and Large beneficial effects would be experienced by its solstitial alignment (Attribute 4).

11.5.4 However, the DCO Scheme would result in Slight adverse effects upon the physical remains (Attribute 2) and siting (Attribute 3) of the Neolithic and Bronze Age funerary and ceremonial sites and monuments in relation to the landscape due to the positioning of new cuttings within the WHS (western and eastern approach roads and portals), which avoid known archaeological remains that contribute to the OUV of the WHS, but partially introduce new severance and impacts on the setting of assets and Asset Groups that contribute to OUV.

11.5.5 The DCO Scheme is assessed to have a Slight beneficial effect on the Integrity of the WHS and a Slight beneficial effect on its Authenticity.

11.5.6 Overall, the DCO Scheme would result in a Slight beneficial effect on the OUV of the WHS as a whole.

The Bored Tunnel Extension

11.5.7 The Bored Tunnel Extension alternative would result in the following effects:

a) Very Large beneficial effects would be experienced by Stonehenge itself (Attribute 1) and Large beneficial effects would be experienced by its solstitial alignment (Attribute 4), the same as the DCO Scheme.

b) Moderate beneficial effects in relation to the siting of monuments in relation to each other (Attribute 5), within the landscape without parallel (Attribute 6), and with regards to the influence that the monuments and their landscape setting have on architects, artists, historians, archaeologists and others (Attribute 7) - which is slightly more beneficial than the DCO Scheme (Slight beneficial).

c) Slight beneficial effects in relation to the siting of Neolithic and Bronze Age funerary and ceremonial sites and monuments in relation to the landscape (Attribute 3) - which is an improvement on the DCO Scheme (Slight adverse).

d) Slight adverse effects upon the physical remains of the Neolithic and Bronze Age funerary and ceremonial monuments and associated sites (Attribute 2), the same as the DCO Scheme.

e) In relation to Integrity and Authenticity, the Bored Tunnel Extension alternative is assessed as Moderate beneficial, which is slightly more beneficial than the DCO Scheme (Slight beneficial).

11.5.8 Overall, the Bored Tunnel Extension alternative would result in a Moderate beneficial effect on the OUV of the WHS as a whole – slightly more beneficial than the DCO Scheme in terms of effect on the OUV of the WHS as a whole (Slight beneficial).

11.6 Risk to the inscription of the site as a World Heritage property

11.6.1 This Outline HIA demonstrates that the Bored Tunnel Extension alternative would have both adverse and beneficial effects.

11.6.2 The inscription of the WHS is based on three criteria:

- *'Criterion (i): The monuments of the Stonehenge, Avebury and Associated Sites demonstrate outstanding creative and technological achievements in prehistoric times.*

- *Criterion (ii): The World Heritage property provides an outstanding illustration of the evolution of monument construction and of the continual use and shaping of the landscape over more than 2000 years, from the Early Neolithic to the Bronze Age. The monuments and landscape have had an unwavering influence on architects, artists, historians and archaeologists, and still retain a huge potential for future research.*

- *Criterion (iii): The complexes of monuments at Stonehenge and Avebury provide an exceptional insight into the funerary and ceremonial practices in Britain in the Neolithic and Bronze Age. Together with their settings and associated sites, they form landscapes without parallel.'*

11.6.3 It is assessed that, as with the DCO Scheme, the Bored Tunnel Extension alternative would not impact upon the continuing relevance and application of the WHS inscription criteria in relation to the Stonehenge, Avebury and Associated Sites WHS. The OUV of the WHS is expressed in the SoOUV which justifies inscription of the WHS under the above criteria.

11.6.4 Overall, it is assessed that the effects of the Bored Tunnel Extension alternative on OUV, Integrity and Authenticity would be Moderate beneficial.

11.6.5 The impacts of the Bored Tunnel Extension alternative have been minimised such that effects on Attributes of OUV are Slight adverse at worst and Very Large beneficial at best.

11.6.6 As with the DCO Scheme, although parts of the Bored Tunnel Extension alternative would have a Slight adverse effect on certain assets and Asset Groups and one Attribute of the OUV of the WHS, none of these effects are deemed so significant overall that they would diminish the OUV of the WHS, its Integrity or Authenticity.

11.7 Additional beneficial measures

11.7.1 Aspirational measures which would have additional beneficial outcomes, such as potential further chalk grassland creation, benefits realised through Environmental Designated Funds and works proposed to be undertaken by agreement, legacy and benefits delivery, and collaboration with the ongoing Partnership Plan for National Trust and English Heritage Trust land and 2015 WHS Management Plan policies and actions, are detailed in the Main HIA for the DCO Scheme (Highways England 2018b, section 12.6). It is assumed that these aspirational measures and benefits would also have the potential to be built into the delivery of the Bored Tunnel Extension as additional benefits, however these are not taken into account in the assessment outcomes presented in this Outline HIA.

11.7.2 With regard to chalk grassland creation, in the Bored Tunnel Extension alternative the land above the extended bored tunnel, and to the north and south of it in the western part of the WHS, would be returned to agriculture. This contrasts with the DCO Scheme which proposes extensive areas of chalk grassland mitigation to the north and south of the western approach cutting as essential mitigation.

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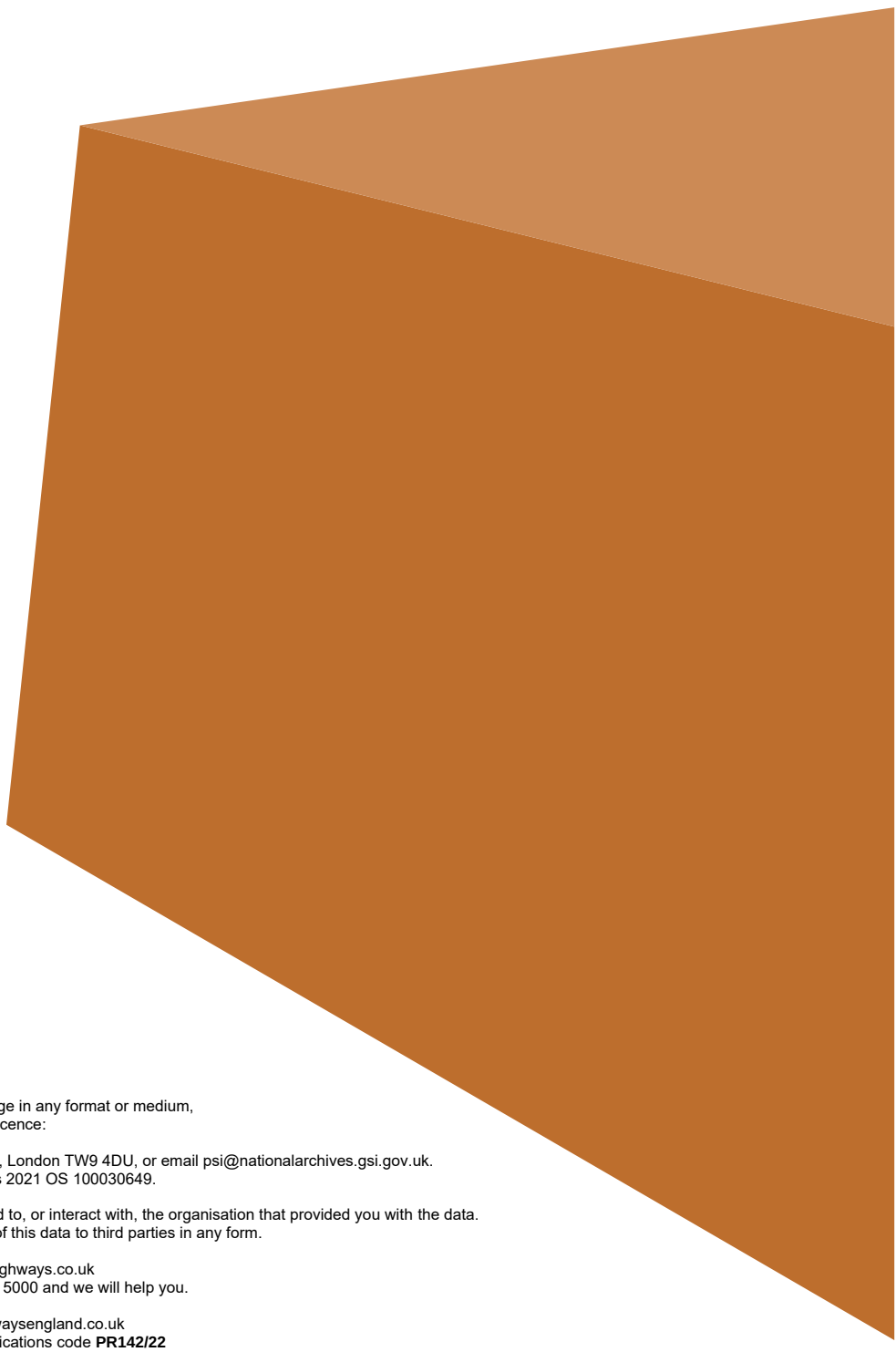
13 Authorship

13.1.1 This Outline HIA has been undertaken by competent experts with relevant and appropriate experience. The technical lead for the cultural heritage assessment is Neil Macnab; his professional qualifications and experience are summarised in the Main ES Appendix 1.1 (Highways England, 2018a).

13.1.2 This Outline HIA has been authored by AmW (a joint venture between AECOM, Mace and WSP) on behalf of National Highways, by Leonora O'Brien MA (Hons) MA MCIfA, AECOM Technical Director, Cultural Heritage; Neil Macnab BA MCIfA, Heritage Lead A303 Amesbury to Berwick Down Scheme Technical Partner; and Chris Moore BA MCIfA, Deputy Heritage Lead A303 Amesbury to Berwick Down Technical Partner.

13.1.3 GIS and report figures have been compiled by Alice Millard BSc (Hons) FRGS, AECOM GIS Consultant and Cathy Coldrey BSc MSc, AECOM GIS Lead.

Illustrations



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