Re: Discovery of 'A Massive, Late Neolithic Pit Structure associated with Durrington Walls Henge'

<u>FURTHER</u> SUBMISSIONS ON BEHALF
OF THE CONSORTIUM OF ARCHAEOLOGISTS
AND THE BLICK MEAD PROJECT TEAM

<u>Introduction</u>

1. Appended here are four papers from archaeologists and historians with unparalleled expertise in the Stonehenge landscape. The Consortium has previously submitted the CVs of Professor David Jacques and also Paul Garwood. We now enclose the CV of Professor Vincent Gaffney who is the lead author on the paper revealing the discovery of a massive late Neolithic pit structure associated with Durrington Walls Henge. The credentials of Brian Edwards are contained within his paper.

2. All of the archaeologists and historians assisting the Consortium are acting pro bono out of real concern for the significant damage which the Proposal will cause the World Heritage Site ('WHS') and sites like Blick Mead. The level of expertise of these archaeologists means that their professional opinions must be given significant weight and cannot be lightly discounted.

3. These submissions address the new discovery of a monumental arrangement of massive pits encircling Durrington Walls henge together with some new archeological finds at Blick Mead. They should be read together with the Consortium's submissions at TRO010025-001960 and submissions made throughout the examination.

4. During the Examination the Consortium made a number of representations which focused on: 1. the failure of Highways England ('HE') to understand the WHS as a whole and 2. that surveying techniques were inadequate. In some ways, it is nice to have been proven right in

such a short space of time and crucially before the decision has been taken. The new discovery undoubtedly demonstrates that the concerns of the Consortium are well founded.

Implications of the new discoveries for understanding the significance of the WHS

5. The recent discovery of the pit structure has profound implications for understanding the significance of the WHS. These are broadly two-fold:

    a. The pit structure adds considerable weight to the argument that the WHS cannot be viewed as a collection of discrete assets rather that the totality and interrelatedness of the features (both above and below ground) together constitute the Stonehenge landscape and underpin attributes of OUV;

    b. The fact that the structure is formed of 'pits' highlights that other such pits within the WHS cannot be discounted as having heritage significance on the basis that they are assumed to be natural features.

6. The fact that a large part of the WHS ought to be seen as a single entity is highlighted by the paper by Gaffney, Baldwin and Garwood appended to these submissions. As that paper highlights:

'The discovery of the Durrington pits, which appear to provide a similar boundary function, albeit uniquely defined by massive pits, may confirm the position that the bounding of very large spaces is a key characteristic of the landscape that has not been fully appreciated previously.

The underlying visual property of the Stonehenge Envelope is an important point when considering the nature of such territories. Stonehenge clearly demonstrates the capacity of pre-existing monuments to structure the later landscape at an extreme scale, and through the tendency for Bronze age monuments to cluster at the edges of horizons viewed from individual monuments (figures 3 and 4). As such, this is primary evidence to show that a large

area of land was directly associated with the monument, and that such areas possessed a contemporary, and interrelated, significance and value.' (p.1)

7. Gaffney, Baldwin and Garwood conclude:

'1) Previous research suggests that that Stonehenge is associated with a territory, the Envelope, and that this, in part, is defined through a visual structuring of monument placement at horizon edges

2) Earlier, detailed study further suggests that the majority of known major Neolithic monuments within the Stonehenge landscape had a statistical impact on later barrow placement. This suggested that the landscape is highly structured and underpinned by a complex set of visual relationships

3) The recent discoveries at Durrington and Larkhill continue this pattern and key barrow groups surrounding Stonehenge link that monument with the Durrington complex.

4) The route of the Stonehenge Avenue reveals a complex relationship with both Stonehenge and the area associated with Durrington and its pit circle. It appears that one purpose of the processional way is to link these two monument groups visually.

5) Given these links, it may be best to view both Stonehenge and Durrington, and their attendant monuments, as a single entity

6) The impact assessment of the current road proposals does not fully appreciate this relationship and specifically the eastern sector of the scheme.

7) The full impact of the road proposal on the unified Stonehenge/Durrington complex, the Avenue route and comparable features elsewhere in the landscape should be re-assessed to consider the complex issue of intervisibility that is a key characteristic of the Stonehenge landscape and to ascertain the full impact of disrupting the key sightlines of the Stonehenge/Durrington complex.'

8. Brian Edwards also emphasizes this point in his paper at paras 1.2.6-1.3.1 in particular. The point is further dealt with throughout Paul Garwood's submission.

9. The import of the pits and the implications of the discovery for other pits within the WHS (including within the road line) is dealt with at paras 2 and 3 (and figures 1 and 2) of Paul Garwood's paper at TRO010025-001960.

Implications of the new discoveries for understanding the impact of the Proposal and work done by Highways England ('HE')

10. First, the new discovery (together with significant new results at Blick Mead) further emphasises the failure of HE to employ surveying techniques which ought to be required within the WHS, an asset of the highest significance. The Consortium reminds the Secretary of State that the World Heritage Convention ('WHC') requires 'identification, protection, conservation, presentation and transmission to future generations' of the WHS. In particular, the UK is required to do 'all it can to this end, to the utmost of its own resources' (art.4). Further, art. 5 of the WHC requires the UK to 'endeavour, in so far as possible, and as appropriate' to 'develop scientific and technical studies and research to work out such operating methods as will make the State capable of counteracting the dangers that threaten its cultural or natural heritage' and to 'take the appropriate legal, scientific, technical, administrative and financial measures necessary for the identification, protection, conservation, presentation and rehabilitation of this heritage'.

11. Para 5.1226 of the NPS for National Networks states that where 'the development is subject to EIA the applicant should undertake an assessment of any likely significant heritage impacts of the proposed project as part of the Environmental Impact Assessment and describe these in the environmental statement'

12. The paper by Paul Garwood appended to the Consortium's submissions at (TRO010025-001960) highlighted that the new discoveries make clear that the techniques used by HE are not fit for purpose (see para.4 in particular). In his latest paper, Paul Garwood has expanded on this issue. He explains persuasively the problems with HE's techniques both in terms of geo-physical survey and trial-trenching evaluation (see parts 2.1 and 2.2). Damningly he states, *inter alia*:

'Geophysical mapping of sub-surface features and deposits along the road corridor is inadequate…'

'Highways England and their archaeological contractors have no comprehensive, seamless, 3D mapping of sub-surface evidence or any means of assessing geophysical data based on multi-sensor survey techniques.'

'…the DAMS relies on single-sensor survey. This provides insufficient baseline information for archaeological decision-making and risks methodological errors by failing to appreciate the number, density, morphologies, scales or complexity of the sub-surface features that more effective application of multiple techniques would reveal.'

'The reliance on trial trenching by Highways England contractors to evaluate both ploughzone/topsoil evidence and the presence/character of sub-surface features, is not very effective: this method is of limited value for gaining a sound understanding of both the impact of the road scheme on the archaeological resource or its true character and complexity.'

'It is also worth noting again that the one large pit/solution hollow superficially sampled in a test trench in the western portal corridor, Feature 24105 (Highways England 2019a), is not deeply buried (it is plough-truncated) yet it does not seem to have been detected even by magnetometry.'

13. That HE's surveying techniques have fallen far short of what ought to be required in the WHS is also underscored by the submission of Professor Jacques appended here. He makes the point that at the Eastern Portal, the differences between finds in an area with 100% sampling vs. 3-4% is stark. He writes:

'The difference in adopting a sampling strategy of 100% at Blick Mead and 3-4% on the Countess side, locations only separated by about two hundred metres, is stark. The Blick Mead results have so far revealed a preserved and long-lived Mesolithic occupation (c.8000-4000 BC), ancient DNA of a diverse variety of flora and fauna, a late Mesolithic tree-throw shelter and occupation surface, well-preserved aurochs' hoofprints, plus a tightly dated laid stone

surface into the spring. Thanks to TerrACE, we now know there are also preserved post-Mesolithic soil sequences which potentially take the WHS narrative much further. The Countess area investigations by the Applicant are completely inadequate by comparison, yet are the basis for this area of the WHS being given a low archaeological value in the HIA.'

14. Although archaeological knowledge will always be developing/improving (see Paul Garwood at section 3), at a minimum HE ought to be required to use best available techniques as are currently available in order to assess the heritage significance and impact of the scheme as far as possible at the date of the decision. Particularly so given the WHS' status.

15. There can be no doubt that the inadequacy of HE's techniques has led to a failure to understand the significance of the WHS and the implications of the Scheme. In layman's terms, it has already been demonstrated that HE has missed a significant feature within the WHS, the question remains as to what else has been missed. Equally, the fact that the DAMS does not require best available techniques and 100% sampling means that, should the Scheme go ahead, that which will be destroyed may not even be recovered or recorded (see part 2.3 of Paul Garwood's paper attached). The scheme ought to be rejected on the basis that HE's heritage assessment has not used techniques commensurate with the status of the WHS.

16. Second, the new discovery of the pits emphasises that the WHS cannot be understood as isolated groups of assets in the landscape. Rather, the entirety of the site needs to be considered as one with an understanding of the interrelationships between the features within it. The new discovery underscores how important the relationships are between the various features within the WHS. This is emphasised by the papers of Gaffney, Baldwin and Garwood, Brian Edwards and Paul Garwood appended herewith.

17. It should not be forgotten that the concern of national policy in the NPS is directed at particular heritage assets. Here, the asset is the WHS as a whole it is not simply the Stonehenge circle. The approach which HE has taken in its Heritage Impact Assessment ('HIA') which focusses heavily on individual asset groupings and fails to consider the significance of their interrelationships is therefore undermined and cannot be relied upon. This is dealt with clearly in Paul Garwood's paper (part 1) which sets out that the new discovery has highlighted the

interrelationship of features in the landscape and how, in failing to appreciate this (and how it underpins OUV), the HIA is not fit for purpose. He states *inter alia*:

'Such structuring of the prehistoric landscape is most immediately visible to us in terms of monumental architecture (such as enclosures, avenues, lines of funerary monuments, etc), but is also evident in the wider spatial patterning of activities in all archaeological settings. We also know that such large-scale total-landscape organizations of monuments and practices changed on several occasions over time and cannot be reduced to a single 'model' of the prehistoric landscape (e.g. see Darvill 2005). These fundamental conditions of the evidence are not recognized by Highways England as the basis for developing their HIA methodology: by focusing on particular sites, the fundamental importance of the *extensive* spatiality and the *interrelatedness* of prehistoric landscape organizations, monuments, social practices, sensory perceptions and meanings, is marginalized or ignored altogether.

The unsuitability of the Highways England approach has been brought into stark focus again, however, by the discovery of the Durrington massive pits structure (Gaffney *et al.* 2020a; cf. Garwood 2020). This not only highlights the coherently organized and integrated character of the prehistoric ceremonial landscape, but also demonstrates that large-scale physical and cognitive ordering of tracts of the Stonehenge landscape effectively created vast monumental structures that had an existence that far transcended any one monument component.'

18. Paul Garwood goes on to provide particular examples of how HE have failed to assess the impact on OUV in relation to attributes five and six together with 'integrity' and 'authenticity'. In short, the methodological shortcomings of the HIA have led to the under-reporting of heritage harm. Paul Garwood concludes:

'The OUV attributes of the WHS are based largely on an understanding of the Stonehenge as a contiguous, structured, whole thing. To destroy parts of this entity, on the basis of some 'heritage value' accountancy rationale (i.e. damage cost valuation in comparison with supposed 'benefits') can only weaken the OUV of the WHS, and seriously compromise the past cultural landscapes we aim to preserve, understand, and present to the public. Despite

the claims made in the HIA, the discussion in section 1.2. demonstrates that the proposed A303 road scheme represents a significant threat to the OUV attributes, Integrity and Authenticity of the WHS. The HIA, therefore, is a seriously deficient document that provides no sound basis for evaluating the effects of the proposed scheme on the WHS or its OUV attributes. It should be discarded, and a more credible assessment framework developed instead based on a sound understanding of the unique prehistoric cultural heritage of the Stonehenge landscape.'

19. Third, the fact that the HIA does not take into account the new discovery or the interrelationship between the various assets (the significance of which is underscored by the new discovery) means that the Environmental Statement ('ES') does not meet the requirements of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as set out at paras 8 and 9 of the Consortium's submissions at TRO010025-001960). The DCO cannot therefore be made without breaching those Regulations.

20. Fourth, the new discovery casts considerable doubt over the decision over where the tunnel portals should be sited. The new discovery has particular significance for the Eastern Portal. As Gaffney, Baldwin and Garwood state:

'Together, these detailed studies strongly suggest that the significance of the Avenue is to integrate the Stonehenge and Durrington monument complexes as a single unit. The tendency for impact assessment of the Stonehenge landscape to treat monuments individually therefore misses a critical characteristic of the Stonehenge landscape. This is specifically illustrated in figure 7. Here, the inset within the figure illustrates the likely visual connections of the eastern sector of the road scheme with the Durrington complex. Consequently, there is a real need for an assessment that treats the Stonehenge and Durrington groups as a single unit. If this is not undertaken, uncritical development, as proposed by the A303, will unwittingly cause substantive damage to how we understand and appreciate this unique landscape.'

21. Once the significance of the Avenue is appreciated and its interrelationship with the Stonehenge and Durrington monument, it now cannot now be maintained that the Eastern

Tunnel Portal is sited in an area of the WHS which is somehow of lesser heritage significance (see Paul Garwood's figure 1 for a clear representation of this). It now appears that the siting of the portal will 'unwittingly cause substantive damage' to how the landscape is understood. Further work clearly needs to take place to understand this (see below) but at this stage the evidence is sufficient to conclude that there will be significant harm to the OUV and the heritage significance of the WHS (the Consortium has dealt with heritage harm from the Western Portal at length in its other submissions to the Examination).

22. Fifth, the new discovery which is made up of 'pits' undermines conclusions that HE has reached as to the presence of several possible pits that would be destroyed by the scheme (see paras 2 and 3 of Paul Garwood's statement sent on 25 June 2020 (TR010025-001960)[1]). Conclusions that these are natural features of no heritage significance in and of themselves are now unsafe.

23. Sixth, and notwithstanding the above, at the very least, the new discovery highlights the need for further research into and assessment of the landscape as a whole. This discovery was made only a couple of months ago but it has existed in the ground for thousands of years. Even if the Secretary of State takes the view that he cannot be certain as to the importance of the relationship between features in the landscape and the impact of the road then he ought to take a precautionary approach and refuse the Scheme. There is (at the very least) a real risk of significant harm to one of the most important heritage assets within this nation. That clearly militates in favour of rejecting the proposal for additional work to be conducted in order properly to understand the landscape and its impacts. Further, if plans for a tunnel proceed following rejection of the DCO, it is clear that the location of the portals will need to be reconsidered in light of this new information. In particular the assessments which led HE to believe that this was a less important area of the world heritage sites are clearly out of date and undermined by this new discovery.

[1] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010025/TR010025-001960-Consortium%20of%20Archaeologists%20and%20the%20Blick%20Mead%20Project%20Team.pdf

Procedure

24. The procedure under the Planning Act 2008 for the examination of NSIPs is directed at enabling a panel of independent expert inspectors rigorously to consider the full factual matrix and the whole gamut of material considerations which sit behind the decision to be made. Whilst there is some provision in the Infrastructure Planning (Examination Procedure) Rules 2010 for the Secretary of State to consider facts which went before the panel, there will be some situations where a new factual matter arises which has potentially such a significant bearing on the decision and/or is of such a technical/complex nature that it ought to be examined along with the rest of the evidence.

25. Heritage impact is clearly front and centre of this decision whether or not to grant a DCO. Again, central to the issue of heritage is the significance of the WHS as a whole and the interrelationships of the features within it. Only once that significance is clearly understood can a judgment be made as to the level of harm which the road presents. Further, what is at stake is, as is described by Gaffney, Baldwin and Garwood, as 'substantive damage' to a World Heritage Site. The decision making process cannot be anything less than robust.

26. The new discovery has a profound impact on: the significance of the WHS, an understanding of the significance of interrelationships between features in the landscape and an understanding of the impact of the road scheme. As this new discovery is fundamental to the decision to be made, the facts of the discovery, its significance and any expert evidence directed to these matters ought to be examined by the independent inspectors. Further, for the significance of the pits to be properly appreciated they must be considered in the context of the WHS and the interrelationships of the features. As the papers by Gaffney, Garwood and Baldwin, Brian Edwards and Paul Garwood make clear, key to the relationships are the intervisibility of the various features and the positioning of the Avenue in particular. At minimum, an attended site visit will be necessary together with rigorous testing and consideration of the evidence by the independent inspectors in order to understand the significance of the interrelationships of the various assets. Without such a procedure, as is provided for within the examination stage under the Planning Act 2008, the process is highly likely to be procedurally unfair.

27. We therefore ask, again, that the Secretary of State either refuses the application and invites HE (if they are minded to continue with it) to restart the process or, to consider whether it is possible for the examination to be reopened and for the new discovery to be considered by the expert panel.

The proposed Sparkford to Illchester Dualling Order

28. Finally, we ask the Secretary of State to take into account his 'minded to decision' on the application for a proposed a 303 Sparkford to Ilchester Dualling Order. On 21 July 2020 the Secretary of State announced that he was minded to refuse the order. If such a refusal follows this will have clear implications for the benefits of the portion of dualling at Stonehenge which is the subject of this application. Any claim that this application would lead to fast flowing traffic along a large stretch of the A303 would be clearly undermined if just one of HE's projects does not go ahead.

29. We note that the new deadline for a decision on the Sparkford to Ilchester Order is 20 November 2020. We therefore consider that the Secretary of State must take into account any refusal on that Order when making a decision on the Stonehenge Tunnel.

Conclusion

30. The Consortium's case throughout the examination has been that the heritage impact of the proposal is so harmful such that the DCO ought to be refused. The new discovery adds further weight to this argument. The discovery undermines much of the work carried out by HE and upon which they invite the Secretary of State to conclude that the scheme will in fact be beneficial in heritage terms. The new discovery demonstrates that HE's techniques are inadequate and that many of its conclusions in the HIA are unsafe.

31. Further, the new discovery has particular implications for the Eastern Portal given its location. There can be no doubt that this is a sensitive area of the WHS and the location of the portal will cause substantial harm to its OUV and heritage significance.

32. At the very least this discovery reveals the need for significant further work to be undertaken before the heritage impact is properly understood and before the requirements of the 2017 Regulations are met. The necessary further work must take into account the interrelationships between various features in the Stonehenge landscape which underpin OUV.

33. Further, the new discovery is of such import and its implications of the scheme are so significant that a written representations procedure following the close of the examination by independent inspectors is not sufficient to ensure robust decision making or procedural fairness. Either the Scheme should be refused and the process re-started (if HE are so inclined) or provision should be made for: accompanied site visits and the proper testing of evidence by the panel of independent inspectors (assisted by the parties and their representatives).

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Implications of the Durrington monumental pits for the A303 Stonehenge road scheme Heritage Impact Assessment and Detailed Archaeological Mitigation Strategy

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Introduction

The recent discovery of the monumental Durrington pits structure in the eastern part of the Stonehenge World Heritage Site (WHS) area completely changes our knowledge and understanding of the prehistoric ceremonial landscape. It also foregrounds a range of fundamental issues relating to (i) the WHS and its Outstanding Universal Value (OUV) attributes, and (ii) the purposes and methods of archaeological valuation and 'mitigation', that should guide planning and project design with respect to the A303 scheme. This submission considers these matters in relation to the *Heritage Impact Assessment* (HIA) and *Detailed Archaeological Mitigation Strategy* (DAMS) devised by Highways England, both of which it is argued are fundamentally flawed and present great risks to the OUV of the WHS and the cultural heritage of the Stonehenge landscape.

1. Heritage Impact Assessment

1.1. *The significance of large-scale prehistoric ceremonial landscape organization for the Outstanding Universal Value of the World Heritage Site and Heritage Impact Assessment*

The flaws of the HIA undertaken as part of the evaluation phase of the A303 scheme (Highways England 2018) are highlighted by the Durrington pit discoveries (Gaffney *et al.* 2020a; Garwood 2020). A fundamental problem is the inadequate attention paid in the HIA document to the OUV attributes of the Stonehenge WHS area, which are not considered fully or precisely in terms of *landscape-scale* interpretation or curation. Although the HIA explicitly recognizes the significance of the OUV attributes as the foundations for the HIA (Highways England 2018, 3-6), making frequent mention of their pivotal importance as criteria for judging the impact of the A303 scheme on the WHS (e.g. Highways England 2018, 9-10), this recognition is not carried through to a well-devised assessment process. The HIA focuses mostly on the definition and assessment of 'assets' (mainly surviving above-ground monuments) (Highways England 2018, 10-20) rather than recognizing that it is the *totality and inter-relatedness* of *all* the monuments, sub-surface features of all kinds, ploughzone sites, and so forth, that together constitute the Stonehenge landscape and underpin the OUV attributes.

There are two major weaknesses in the way the HIA is formulated:

(i). The HIA privileges and gives undue weighting to 'sites and monuments' as significant points or locales, and gives less consideration to the interrelatedness of sites and monuments at extensive spatial scales (including visual perception, viewsheds, etc), even though it is the coherently structured character of the Stonehenge ceremonial landscape that forms the basis for much of the OUV of the WHS, including its Integrity and Authenticity.

(ii). The HIA does not take sufficient account of how the OUV attributes are contextualized and elaborated upon in the WHS Management Plan (Simmonds & Thomas 2015, section 2.3). For example, the description of 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*; Highways England 2018, 6), is best understood in conjunction with the more detailed characterization in the WHS Management Plan:

"The design, position and interrelationship of the monuments are evidence of a highly organised prehistoric society able to impose its concepts on the environment. In some parts of the WHS, monuments or groups of monuments, such as the King Barrow Ridge barrow cemetery, Stonehenge and the Normanton Down barrow cemetery, are so well-preserved and prominent that they and their physical and topographical interrelationships form immediately recognisable parts of an archaeological landscape. …. In other parts of the WHS, however, the monuments and sites have become degraded or masked and their significance and physical relationships to one another and the landscape are no longer visible to the naked eye, but are nevertheless equally attributes of the Site's OUV. There are also areas which appear to have been deliberately left empty of monuments. These are important for our constantly developing understanding of the landscape as whole" (*ibid*., section 2.3.21).

Such structuring of the prehistoric landscape is most immediately visible to us in terms of monumental architecture (such as enclosures, avenues, lines of funerary monuments, etc), but is also evident in the wider spatial patterning of activities in all archaeological settings. We also know that such large-scale total-landscape organizations of monuments and practices changed on several occasions over time and cannot be reduced to a single 'model' of the prehistoric landscape (e.g. see Darvill 2005). These fundamental conditions of the evidence are not recognized by Highways England as the basis for developing their HIA methodology: by focusing on particular sites, the fundamental importance of the *extensive* spatiality and the *interrelatedness* of prehistoric landscape organizations, monuments, social practices, sensory perceptions and meanings, is marginalized or ignored altogether.

The unsuitability of the Highways England approach has been brought into stark focus again, however, by the discovery of the Durrington massive pits structure (Gaffney *et al.* 2020a; cf. Garwood 2020). This not only highlights the coherently organized and integrated character of the prehistoric ceremonial landscape, but also demonstrates that large-scale physical and cognitive ordering of tracts of the Stonehenge landscape effectively created vast monumental structures that had an existence that far transcended any one monument component. This can be illustrated using just two (of many) periods of large-scale landscape organization (see Figure 1): the Durrington pits structure of the early to mid-3rd millennium BC, and the Early Bronze Age funerary landscape – focused on Stonehenge itself - that developed during the early 2nd millennium BC. In addition to basic mapping of these landscape-scale structures, it is essential that the wider organization of social practices that were defined by these structures, both within them and around them, is appreciated, and that even more extensive visual parameters and connections existed in the past (discussed in Gaffney *et al.* 2020b).

As can be seen in Figure 1, the A303 DCO traverses these prehistoric ceremonial landscapes structures, cutting through them directly in a highly destructive manner, and impacting on them more widely by contaminating their visual properties and relationships (see Gaffney *et al.* 2020).

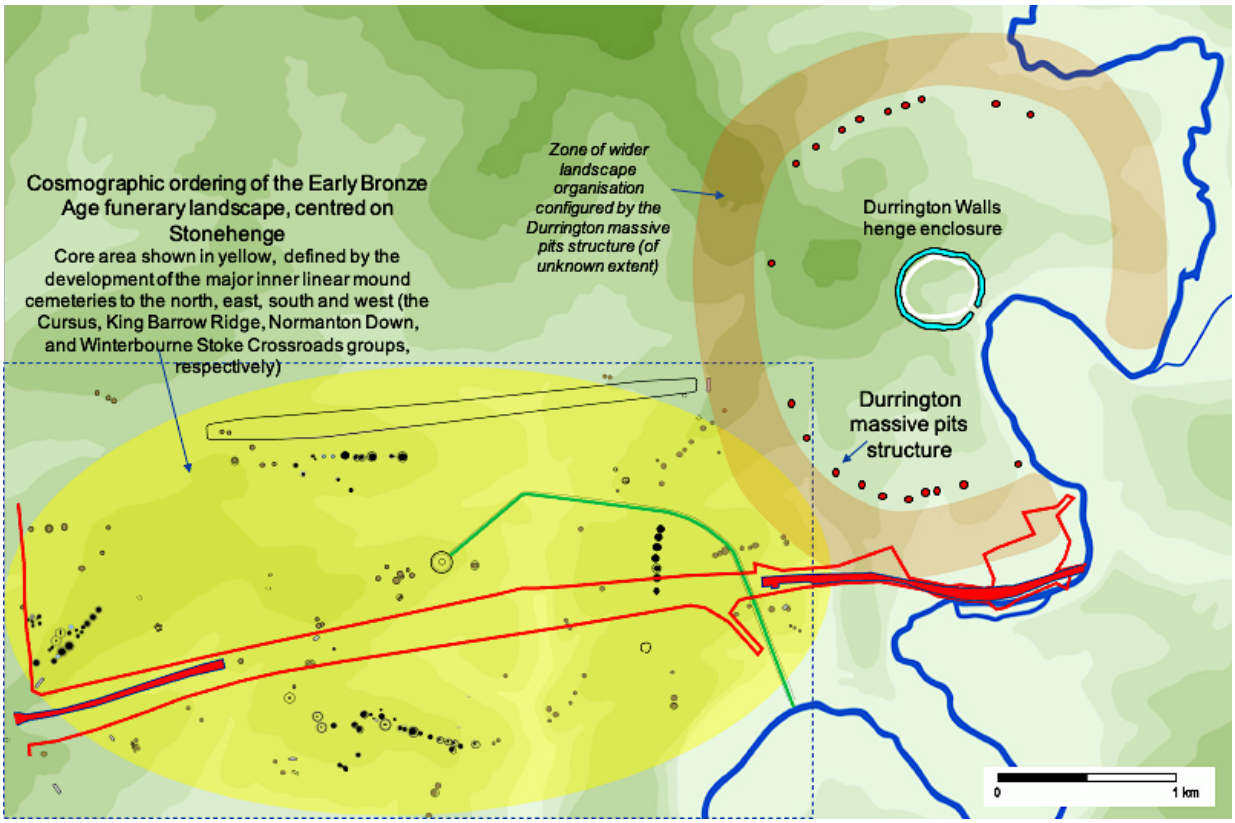

Figure 1: Two of the principal phases of very large-scale monumentalisation and integrative structuring of the prehistoric ceremonial landscapes within the Stonehenge World Heritage Site area:

(i) the Durrington pits structure of the early to mid-3rd millennium BC (it is likely this configured not only activity within the pit circuit but also outside it: indicated by the brown arc);

(ii) the structured Early Bronze Age funerary landscape with Stonehenge at the centre, surrounded by elite funerary monument organized in massive linear mound arrays (on ridge lines with extensive vistas) that developed during the early 2nd millennium BC.

The area of the A303 scheme DCO within the WHS area is shown in red outline, and the areas of proposed major roadworks in solid red).

1.2. *The implications of new discoveries and landscape-scale frameworks of knowledge and understanding for the Heritage Impact Assessment document*

In the light of the comments in section 1.1, and given that such large-scale structuring of the Stonehenge landscape has been recognised by archaeologists for many decades, it is incredible that the HIA treats the landscape largely as a mass of disconnected 'assets' and 'asset groups' (essentially individual monuments or clusters of monuments) that are assessed in isolation and their value negotiated with respect to potential A303 impacts only locally (Highways England 2018, 10-20, 167-485) rather than in relation to larger-scale frames of reference.

This methodological error is compounded to an extreme degree by the extrapolation of calculations of value and impact based on 'asset 'and 'asset-group' assessments to the landscape-scale OUV attributes (Highways England 2018, table 3), despite there being little evaluation of how these were co-related and inter-referenced in the past. The 'assessments' of the effects of the road scheme on the OUV of the WHS and matters of 'Integrity' and 'Authenticity' presented in the HIA (Highways England 2018, 23-8) are thus unreliable, and of course take no account of the recent Durrington discoveries. For example:

OUV attribute 5: *The siting of Neolithic and Bronze Age funerary and ceremonial sites and monuments in relation to each other***.** Rather than a 'slight beneficial effect', the scheme will in reality have a 'large adverse effect'. The serious damage caused to the cosmographically-structured Early Bronze Age funerary landscape by the western tunnel portal and road cutting was highlighted during the Examination Authority' cultural heritage hearings (Garwood 2019a, 2019b). The full impact of the road scheme on the Durrington monumental pits structure and the landscape zone this demarcates (cf. Garwood 2020) is also severe, and presently not understood in full, but there is no question that this has exceptional importance for the wider relationships among Neolithic ceremonial and occupation sites and related areas of prehistoric activity across the entire eastern part of the WHS.

OUV 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*. Similar points to those made in relation to OUV attribute 5 can be made in relation to OUV attribute 6. The Highways England assessment that the road scheme will have a 'slight beneficial effect' is unwarranted; in reality it will have a 'large adverse effect' by permanently blighting the western part of the WHS in the vicinity of Winterbourne Stoke Crossroads, and by impacting on the newly discovered Durrington pits monumentalized landscape.

The huge cutting for the western tunnel portal approach road: (i) fragments the remarkable Early Neolithic long barrow concentration in this area (the densest such monument cluster in Europe; cf. Roberts *et al.* 2018); (ii) slices though the Chalcolithic/Early Bronze Age settlement area that extends south-north on the high ground to the west of Stonehenge (possibly the largest 'Beaker' settlement in Europe; cf. Pollard *et al.* 2017); (iii) compromises the setting of the Early Bronze Age linear barrow group (the best-preserved funerary monument complex of this period in north-west Europe, integral to the Early Bronze Age structuring of the landscape; Garwood 2019a, 2019b), and (iv) breaks up the highly-organized later Bronze Age and Iron Age zone of field systems and settlement that lies across the western part of the WHS (Pollard *et al.* 2017). The adverse effects of the road scheme in this area are exceptionally severe.

To the east, we have only just recognized the existence of the very large-scale organization of the ceremonial and inhabited landscape marked by the Durrington pits (Gaffney *et al.* 2020a), but there is no question that this unparalleled new structure conditioned the disposition and settings of Neolithic (and later prehistoric) activity at an unknown but vast scale (Garwood 2020). The extent to which the zones within and outside the circumference of pits were differentiated in terms of practices and meanings is also unknown, but it is likely that the pits dictated movements of people and the wider organisation of social life in a zone that extended for hundreds of metres beyond the pit circuit. This zone is directly impacted upon by the road scheme DCO.

Integrity: In the light of the points made with respect to OUV attributes 3-6 above, the claim made by Highways England that the road scheme will have a 'slight beneficial effect' on the Integrity of the WHS and its OUV (2018, 28-30) is unfounded. Whatever the supposed advantages of the scheme for improving the 'integrity' of parts of the WHS, these are far outweighed by the disadvantages. In any case, the calculation adopted by Highways England, that 'trades off' beneficial and adverse effects on OUV attributes, ignores the integrity of the WHS as a whole – the OUV attributes *together* define the WHS and supposed enhancement of some does not justify damage to the others.

The Durrington monumental pits and the extensively-organised landscape zones these define, add significantly to the OUV of the WHS. These demonstrate the existence of a new - previously-

recognised - scale of interrelatedness, coherence and integration in the structuring of Neolithic and Bronze Age ceremonial landscapes. These spanned the entire WHS from east to west, and probably far beyond (see Figure x), and encompassed even more extensive visual relationships and kinds of sensory integration (Gaffney *et al.* 2020b). The extremely damaging ('large adverse') effect of the scheme on the Integrity of the WHS, in the way it cuts completely through the structured prehistoric landscape, and physically changes or destroys parts of it, are unmistakable.

Authenticity: Highways England's claim that the road scheme will have a 'slight beneficial effect' on the Authenticity of the WHS and its OUV (2018, 30-1) is similarly unfounded. Key features of authenticity noted by Highways England such as 'form and design', interrelationships between 'assets', 'location and setting', and the relationships between 'assets' and landscape, would all be compromised by the road scheme. It is extraordinary that the damage to the highly structured Early Bronze Age funerary landscape that would be caused by the western portal road cutting, and the vast physically- and visually-intrusive Winterbourne Stoke Junction (Garwood 2019a), has not been properly assessed. There is no justification for compromising the authenticity of the Early Bronze Age ceremonial landscape, the coherence and preservation of which is unparalleled in Europe. Similarly, the landscape setting and the formal and design properties of the Durrington pits structure (Gaffney et al 2020a, 2020b), the full character and wider relationships of which in the landscape around are yet to be investigated, present a new dimension to evaluation of the Authenticity of the WHS (for example, the Durrington pit circle viewshed to the southeast includes much of the eastern portal approach including the proposed raised causeway and bridge across the Avon valley; Gaffney *et al.* 2020b, fig.5).

1.3. *Evaluation of the Heritage Impact Assessment undertaken by Highways England*

The OUV attributes of the WHS are based largely on an understanding of the Stonehenge as a contiguous, structured, whole thing. To destroy parts of this entity, on the basis of some 'heritage value' accountancy rationale (i.e. damage cost valuation in comparison with supposed 'benefits') can only weaken the OUV of the WHS, and seriously compromise the past cultural landscapes we aim to preserve, understand, and present to the public. Despite the claims made in the HIA, the discussion in section 1.2. demonstrates that the proposed A303 road scheme represents a significant threat to the OUV attributes, Integrity and Authenticity of the WHS. The HIA, therefore, is a seriously deficient document that provides no sound basis for evaluating the effects of the proposed scheme on the WHS or its OUV attributes. It should be discarded, and a more credible assessment framework developed instead based on a sound understanding of the unique prehistoric cultural heritage of the Stonehenge landscape.

2. Detailed Archaeological Mitigation Strategy

The Detailed Archaeological Mitigation Strategy (DAMS) devised by Highways England addresses its own assessment of the cultural heritage Impact of the A303 scheme. As the HIA in this case is not – by any measure - fit for purpose (as outlined in section 2), it follows that the DAMS is compromised at a fundamental level.

The flawed character of the DAMS at strategic and methodological levels has been commented on previously in some detail (e.g. Council for British Archaeology 2019, Garwood 2019c, Parker Pearson 2019), and also in the light of the new Durrington pit discoveries (Garwood 2020). In every respect,

the DAMS falls far short of what we should expect in a WHS context (where prevailing research-quality standards of field method should apply). In the light of new the new discoveries, a few further points to clarify and extend previous observations can be made:

2.1. *Geophysical survey*

Geophysical mapping of sub-surface features and deposits along the road corridor is inadequate: this relies almost exclusively on magnetometry, which records just one kind of variation (soil magnetism), 2-dimensionally and superficially (i.e. mostly 0-0.5 m depth range). Although the quality of the magnetic evidence is good, including the data provided by *Stonehenge Hidden Landscape Project* (in raw pre-analysis map form), little or no use was made of other methods, which not only provide completely different kinds of evidence but also 3-dimensional data relating to the depth and volume of sub-surface features and deposits several metres deep (e.g. Ground Penetrating Radar and Electro-Magnetic Induction). Consequently, Highways England and their archaeological contractors have no comprehensive, seamless, 3D mapping of sub-surface evidence or any means of assessing geophysical data based on multi-sensor survey techniques.

This is weak practice considering recent advances in geophysical survey technologies and indeed the major lessons and results of the *Stonehenge Hidden Landscapes Project* (e.g. Gaffney *et al.* 2012, 2018). Recent ground-breaking discoveries within the WHS, which have totally transformed our knowledge and understanding of the Stonehenge landscape, including the unsuspected huge timber palisade enclosure sealed by the Durrington superhenge earthwork (Gaffney *et al.* 2018), and the Durrington massive pits structure (Gaffney *et al.* 2020), have been due entirely to the application of cutting-edge geophysical investigative techniques and their expert interpretation, yet the DAMS relies on single-sensor survey. This provides insufficient baseline information for archaeological decision-making and risks methodological errors by failing to appreciate the number, density, morphologies, scales or complexity of the sub-surface features that more effective application of multiple techniques would reveal.

The limited and uneven character of Highways England's archaeological evaluation processes indicated in previous submissions (e.g. Garwood 2019c, 2020) thus stem at least in part from the nature of the geophysical surveys they have relied on. More specifically, their methods cannot identify features or deposits that have low levels of magnetic variation in relation to bedrock or other deposits (highlighted by recent analysis of electro-magnetic datasets in the course of the Birmingham/Ghent *Stonehenge Landscapes EMI Project*), nor can they recognize any features or deposits that are more than c.0.5 m deep from the current land surface (e.g. those buried by later colluvium or alluvium, especially along the eastern portal approach road).

2.2. *Trial trenching evaluation*

The reliance on trial trenching by Highways England contractors to evaluate both ploughzone/topsoil evidence and the presence/character of sub-surface features, is not very effective: this method is of limited value for gaining a sound understanding of both the impact of the road scheme on the archaeological resource or its true character and complexity. Trial trenching is at best a blunt instrument that is widely used in commercial archaeology contexts for rapid extensive invasive site evaluation, yet in itself it is highly destructive (e.g. ploughzone/topsoil deposits are rarely sampled intensively and are reworked and redistributed in backfilling) and sampling scales/intensities often questionable. The conclusions of the main review of the effectiveness of trial trenching (Hey & Lacey

2001) are especially troubling with respect to identifying Neolithic and Bronze Age period features: "no technique used …yielded even moderate results, although the simulations indicate that dense trenching regimes of (of between 6 and 10%) may be more successful" (*ibid*., 59). The A303 trial trenching methodology involved far lower sampling levels, with little testing of 'geophysical anomalies'. In the western portal approach corridor, including evaluation work in 2002, a total area of c.9300 m^2 of 16.85 ha has been trial-trenched, or 0.055%. In the eastern portal approach corridor trenching is limited only to an 'evaluation area' comprising a small part of the DCO on the north side of the existing A303, yet even just within this zone and including previous work the total area trial-trenched is well below 0.5%. There is no reason, therefore, to believe that this sampling regime, even in combination with previous evaluations in the same area, provides a sound basis for evaluating the presence/absence, scale or character of prehistoric evidence in sub-ploughsoil contexts. It certainly includes no systematic evaluation of geophysical anomalies to establish their character or provide any means to model anomaly types and their spatial distributions more widely.

Trial trenches are also generally shallow, for several practical reasons and also because of the costly and time-consuming requirements of shoring or stepped trenching for safety. As such, whilst it is an effective means of evaluating deep deposits at specific locales, it is especially ineffective for examining deep deposits and features in an extensive manner. In the case of the A303 scheme, only *one* evaluation trench seriously investigated the extensive deeper colluvial sediments, including buried soils (and in all likelihood numerous buried archaeological features invisible to magnetometry) along the eastern corridor approach (T504; Highways England 2019b). All the other evaluation trenches in this area merely stopped at c.1.5 m depth, and thus provide little information about prehistoric cultural activity along the dry valley, including the potential presence of solution hollows, massive pits, the wider range of ancient features, or deposits across ancient buried land surfaces. The research significance of any such discoveries would be very great, not only in themselves, but also because of the general rarity of buried prehistoric archaeological sites undamaged by surface plough truncation, and the very great rarity of excavations in valley contexts in chalkland environments where it is likely that prehistoric settlement was concentrated (especially in areas close to springs and streams, as in the case of the eastern portal corridor).

It is also worth noting again that the one large pit/solution hollow superficially sampled in a test trench in the western portal corridor, Feature 24105 (Highways England 2019a), is not deeply buried (it is plough-truncated) yet it does not seem to have been detected even by magnetometry.

2.3. *Evaluation of the DAMS in the light of new discoveries and the flawed nature of the archaeological evaluation process*

At present, therefore, there is very little reliable data for detecting even large archaeological features, or for evaluating them effectively, in the eastern part of the DCO, while the wider range of supposed 'evaluation data' is insufficient for developing an overarching archaeological mitigation strategy or coherent field methodology in any part of the DCO. In effect, despite the archaeological evaluations that have taken place, it is currently impossible to predict the scale, density, complexity or significance of any subsurface archaeological evidence that might be encountered in the course of larger-scale work. In this light, and taking account of the many other fundamental flaws in the DAMS highlighted on many previous occasions (e.g. the complete inadequacy of proposed ploughzone sampling, of huge importance for understanding past landscape inhabitation; Parker Pearson 2019; Garwood 2019c), it is apparent that the DAMS provides no effective framework for archaeological

investigation along the line of the A303 road scheme within the WHS. It should be discarded, and a more credible strategy developed instead based on:

(1) a new, reliable Heritage Impact Assessment (see section 1.3)

(2) more reliable and more comprehensive evaluation data; for example: (i) full Ground Penetrating Radar and EMI survey; (ii) characterization and evaluation of geophysical data and feature/deposit types; (iii) more extensive, and more effective investigation of deep sediments in valley contexts to define their archaeological significance robustly; (iv) excavation of samples of larger features (e.g. to their bases) and buried land surfaces in order to define them and evaluate their research potential.

(3) development of a field methodology that takes full account of (1) and (2), and applies sampling strategies (e.g. 100% ploughzone sampling, 100% excavation of all anthropogenic features, and all 'natural' features and deposits that contain cultural material) that are appropriate to the WHS, its OUV attributes, and the extraordinary cultural significance of the Stonehenge landscape.

3. Concluding comments

It is impossible to predict which parts of, or specific locales within, the WHS will in the future prove to contain significant new evidence of past monuments, cultural practices or cultural meanings (e.g. through visual and other sensory media). Knowledge and understanding of the Neolithic and Bronze Age ceremonial landscapes, and the wider character of landscape inhabitation in all periods, have been transformed by a succession of major discoveries in just the last decade, many unprecedented and in some cases unique archaeologically. At the point of writing, the huge geophysical datasets amassed in the course of the *Stonehenge Hidden Landscapes Project* are being evaluated and interpreted systematically for monograph-scale publication (which will provide points of departure for a host of future field investigations). Similarly, the results of the *Stonehenge Landscapes EMI Project* are currently being assembled for the first (in early 2021) of a series of major publications. There is no question that these too will provide significant new insights into the nature of the evidence, major new interpretations of the ancient cultural landscape, and new lines of enquiry and investigation in the future. The damage that the current road scheme will entail should not, therefore, be calculated only in relation to the current characterization of the OUV attributes of the WHS, and the new discoveries which have already further enhanced these.

Highways England's HIA and DAMS documents, which supposedly provide a means to evaluate and mitigate the effects of the road scheme archaeologically, are seriously awry in principle and design, and not fit for purpose practically. They do not provide any sound basis for justifying the destruction of parts of the WHS area, or the serious damage this will cause to the OUV of the WHS. Indeed, they represent a threat to the very fabric of the WHS, and the extensive, structured, ancient ceremonial landscapes we can actually *see* – often in uniquely preserved forms – around Stonehenge. The HIA and DAMS should therefore be discarded in their present guises, and the destructive nature of the present road scheme within the WHS recognized at a fundamental level, in order to develop alternative solutions to A303 improvement that do not involve irreversible damage to the very things the road tunnel was intended to protect and enhance.

14/7/20

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Further comment on the implications of the Durrington pit structure for the A303 road scheme

Professor Vincent Gaffney[1], Eamonn Baldwin[2] and Dr Paul Garwood[2]

A commentary on the discovery of a monumental arrangement of massive pits encircling Durrington Walls henge was provided in a previous submission by Paul Garwood (University of Birmingham). The purpose of that document was to outline the significant implications of the potential presence of such features for the A303 road scheme and the Detailed Archaeological Mitigation Strategy (DAMS) overall (figure 1). As the discovery of the Durrington pits is a recent event, they remain the subject of an ongoing research programme but there remains a need to provide a larger context for the monument, in respect of the proposed road scheme.

It should be emphasised that the publication of the Durrington pits within Internet Archaeology provides only a preliminary assessment of the significance of the monument, and primarily emphasised it's character, the immediate context of the structure, and the available dating evidence (Gaffney et al. 2020). Whilst some comment was made on the presence of features of comparable size within the Stonehenge landscape, significant work remains to be undertaken at the site including further study of the environmental evidence from cores taken from the pits and, ultimately, the larger landscape context of the monument.

Key considerations, when discussing the relationship of the Durrington pits to the larger landscape, relate to the nature of development within the larger Stonehenge landscape. Current interpretation of the Durrington and Stonehenge monuments suggests that they relate to larger territories with some level of exclusivity (figure 2, see also Parker Pearson and Ramilisonina. 1998). In respect of Stonehenge, most archaeologists would recognise the concept of the Stonehenge Envelope as an important aspect of the character of the henge. This area represents the near, visual territory of Stonehenge and is further defined by the clustering of later burial mounds around the near horizons of the monument and a general lack of contemporary monuments within that area. The discovery of the Durrington pits, which appear to provide a similar boundary function, albeit uniquely defined by massive pits, may confirm the position that the bounding of very large spaces is a key characteristic of the landscape that has not been fully appreciated previously.

The underlying visual property of the Stonehenge Envelope is an important point when considering the nature of such territories. Stonehenge clearly demonstrates the capacity of pre-existing monuments to structure the later landscape at an extreme scale, and through the tendency for Bronze age monuments to cluster at the edges of horizons viewed from individual monuments (figures 3 and 4). As such, this is primary evidence to show that a large area of land was directly associated with the monument, and that such areas possessed a contemporary, and interrelated, significance and value.

There is, however, a larger context with respect of the structuring of the later Neolithic and Early Bronze age monument data within the Stonehenge landscape. A statistical study of barrow placement across a 13 x 13 km block of landscape around Stonehenge, undertaken twenty years ago, demonstrated the

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broader link between major Neolithic monuments and later barrows/ring ditches placement on the basis of intervisibility (Exon et al. 2000). This study concluded that;

- Early monuments were deliberately positioned to have large viewsheds (illustrated by models of monument placement generating a value of 75.4 for actual placement/random placement versus a random placement/random placement value of 48.9).
- Monuments have been preferentially sited within the viewsheds of the pre-Bronze Age monuments (illustrated by models of monument placement generating a value of 113.3 for actual placement/actual placement versus an actual placement/random placement value of 75.4). This can be interpreted to mean either that the barrows are intended to be visible from the pre-existing foci or that they are intended to have views towards them.
- Monuments are also positioned to be more visible than expected even from arbitrary positions within the study area (illustrated by models of monument placement generating a value of 64.7 for random placement/actual replacement versus a random placement/random placement 4value of 8.9).

The study therefore indicated that majority of major Neolithic monuments had extensive visual territories and that these that contributed to the underlying, larger structure and form of the monumental landscape through the placement of later prehistoric monuments. This characteristic has not generally been considered throughout the planning process, despite clearly being significant in terms of the landscape structure and how contemporary curators should manage the landscape.

As the Durrington pit circle had not been discovered at the point that this large statistical analysis was undertaken, the site has not been studied at that level. Whilst this would clearly be desirable, it is possible to consider whether such processes may be detected in respect of the Durrington pit circle, by considering the visible areas associated with the pit group overall (figure 5), and the associated site of the Larkhill causewayed enclosure, which is clearly integrated within the circuit (figure 6).

In doing so, attention is drawn to the position of three barrow groups within the viewshed of Stonehenge, and which are central to the concept of the Stonehenge Envelope:

1The Cursus Group
2 The King barrow Ridge groups
3 The Normanton Down group

These barrow groups formalise the visual territory of Stonehenge on the northern, eastern and southern edges, and also figure prominently within the composite viewsheds of the pit circuit (figure 5) and the Larkhill causewayed enclosure (figure 6). Although it would be advisable to re-run the original statistical analysis of the larger landscape structure to assess the significance of this observation, the general conclusion that monument placement is a structured phenomenon does seem a reasonable position. Following from that, we may also conclude that the commonality of these barrow groups within the visual territories of both Stonehenge and the Durrington complex, and the linkage between Durrington, Stonehenge and Larkhill, is a real phenomenon and that this should be considered in any proposed development within the world heritage landscape.. Moreover, when Larkhill and Durrington viewsheds are combined (figure 7,) the area of the Stonehenge Envelope is essentially incorporated within the combined visual territory of the Durrington monument complex overall. This may suggest that integration was a key characteristic of the Stonehenge and Durrington groups and that the two

monument clusters are best considered as single group with respect of cultural heritage management and curation.

One other significant point from the Exon publication should be raised here, and this relates to the linking role of the Stonehenge Avenue. Although usually regarded as primarily a processional way, linking Stonehenge to the Avon, Gardiner notes that the route taken by the Avenue is not the most direct approach to Stonehenge (figure 8. See also Cleal *et al* 1995, 40). Detailed study by Exon et al. (2000,72) further suggested that the Avenue has a series of sections with different characteristics and ambient views.

1. At the River Avon. The view is very restricted within the river valley. It is the point with the very least visibility score along the whole Avenue route. At this point a single long barrow, Amesbury 140 is visible, as well as the Coneybury King Barrow.
2. Moving uphill a number of long barrows become visible as one moves forward. Besides Amesbury 140, Bulford, the long barrow south of Woodhenge, the long barrow south of Fargo Road, Knighton Down and Knighton Barrow emerge only a short distance along the first stretch of the Avenue. Indeed, this first linear section is aligned on the Knighton long barrow. At the same point the viewer can now see Woodhenge, the Cuckoo Stone and the position of the Coneybury Anomaly. The Coneybury King Barrow, very prominent on the skyline, appears to be frequently visible along the route. Roughly at the first bend, Robin Hood's Ball comes into view for the first time.
3. The top of King Barrow Ridge possesses a very wide view, wider even than that from Stonehenge. The Cursus Barrows, Fargo henge, the Stonehenge Cursus and eight long barrows become visible. Stonehenge, Woodhenge, and the barrows in the Lake Group (but not Wilsford) are all prominent.
4. Downslope from the ridge to the west. Halfway down the slope, the Cursus Barrows and the Fargo mini-henge disappear from view, but Robin Hood's Ball and much of the Cursus are still visible.
5. At the lowest point, beyond the second bend of the Avenue. No henges or major barrow group locations are visible, but three long barrows, Robin Hood's Ball and the round barrows on the eastern fringes of the envelope can be seen all the time.
6. Moving uphill from the second bend. Rox Hill is visible to the south, but then disappears. Then, for the first time since it came into view at the first bend, Robin Hood's Ball disappears as does Stonehenge itself. Then Rox Hill also disappears.
7. Last third of the last straight. Robin Hood's Ball returns to view, then Stonehenge, firstly as the main object, outlined against the sky, and then against the background of the low Normanton and higher Wilsford/Lake ridges.

Sections two and three relate to those areas where the southern and western route of the pit circle is now known to run. Figure 8 illustrates the original illustration from Exon et al. 2000, figure 7.5). The authors of this study considered that the route of the Avenue was essentially chosen to provide a changing pattern of views when walking along the Avenue route from east to west, and that the route of the processional way was designed to integrate these diverse areas as the viewer moved along the processional way.

This point has recently been taken further by Simon Banton (http://www.stonehengemonument.co.uk/2020/07/avenue-walk-and-durrington-walls-pits.html) , specifically in relation to the new discoveries.

Together, these detailed studies strongly suggest that the significance of the Avenue is to integrate the Stonehenge and Durrington monument complexes as a single unit. The tendency for impact assessment of the Stonehenge landscape to treat monuments individually therefore misses a critical characteristic of the Stonehenge landscape. This is specifically illustrated in figure 7. Here, the inset within the figure illustrates the likely visual connections of the eastern sector of the road scheme with the Durrington complex. Consequently, there is a real need for an assessment that treats the Stonehenge and Durrington groups as a single unit. If this is not undertaken, uncritical development, as proposed by the A303, will unwittingly cause substantive damage to how we understand and appreciate this unique landscape.

Conclusions

1) Previous research suggests that that Stonehenge is associated with a territory, the Envelope, and that this, in part, is defined through a visual structuring of monument placement at horizon edges
2) Earlier, detailed study further suggests that the majority of known major Neolithic monuments within the Stonehenge landscape had a statistical impact on later barrow placement. This suggested that the landscape is highly structured and underpinned by a complex set of visual relationships
3) The recent discoveries at Durrington and Larkhill continue this pattern and key barrow groups surrounding Stonehenge link that monument with the Durrington complex.
4) The route of the Stonehenge Avenue reveals a complex relationship with both Stonehenge and the area associated with Durrington and its pit circle. It appears that one purpose of the processional way is to link these two monument groups visually.
5) Given these links, it may be best to view both Stonehenge and Durrington, and their attendant monuments, as a single entity
6) The impact assessment of the current road proposals does not fully appreciate this relationship and specifically the eastern sector of the scheme (figure 7)
7) The full impact of the road proposal on the unified Stonehenge/Durrington complex, the Avenue route. and comparable features elsewhere in the landscape. should be re-assessed to consider the complex issue of intervisibility that is a key characteristic of the Stonehenge landscape and to ascertain the full impact of disrupting the key sightlines of the Stonehenge/Durrington complex.

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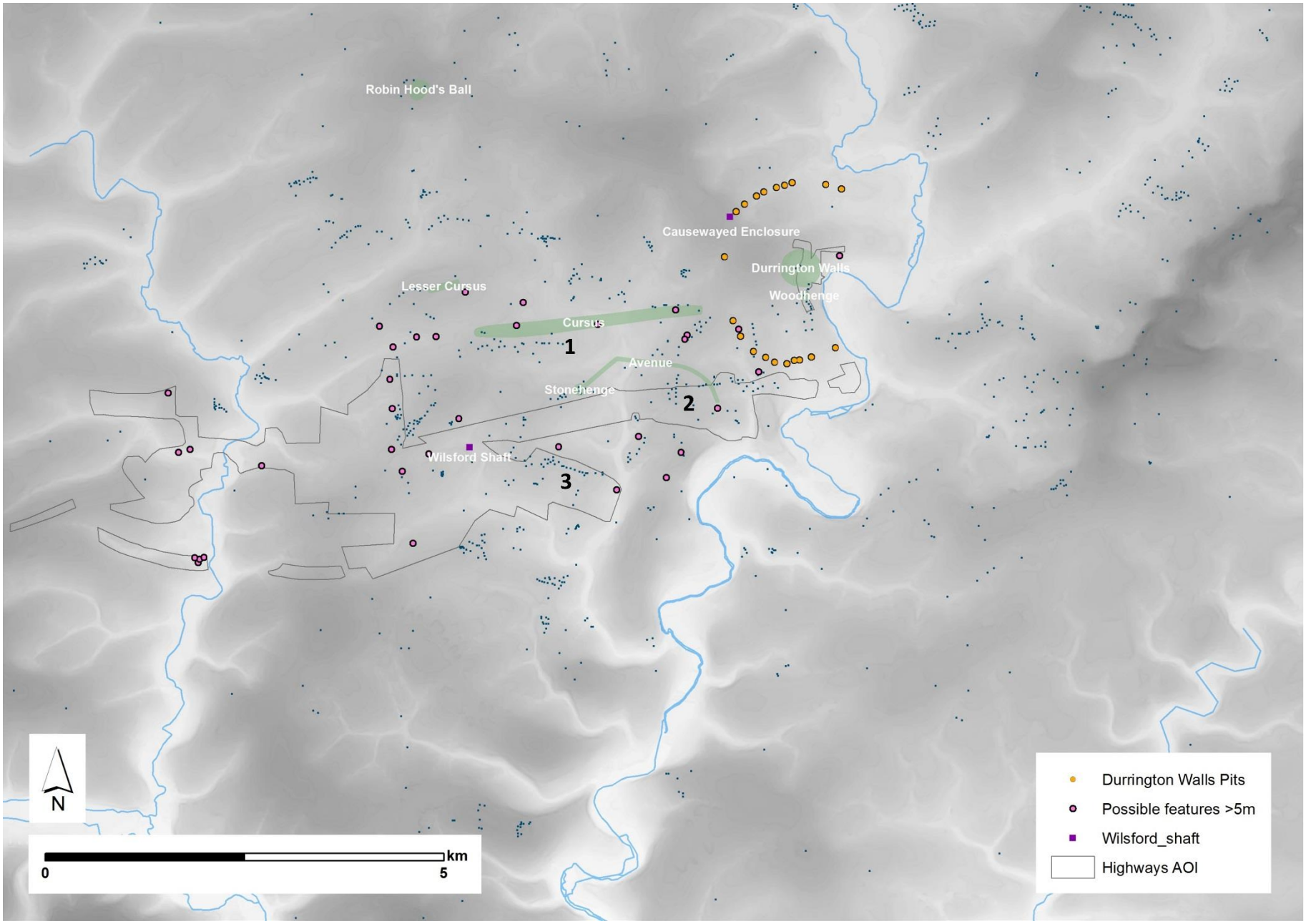

Figure 1. The Durrington Pit circle and possible features greater than 5m in diameter. Principal monuments are named and other monuments as points. Numbered barrow groups are (1) The Cursus Group, (2) The King Barrow Ridge groups, (3) The Normanton Down group

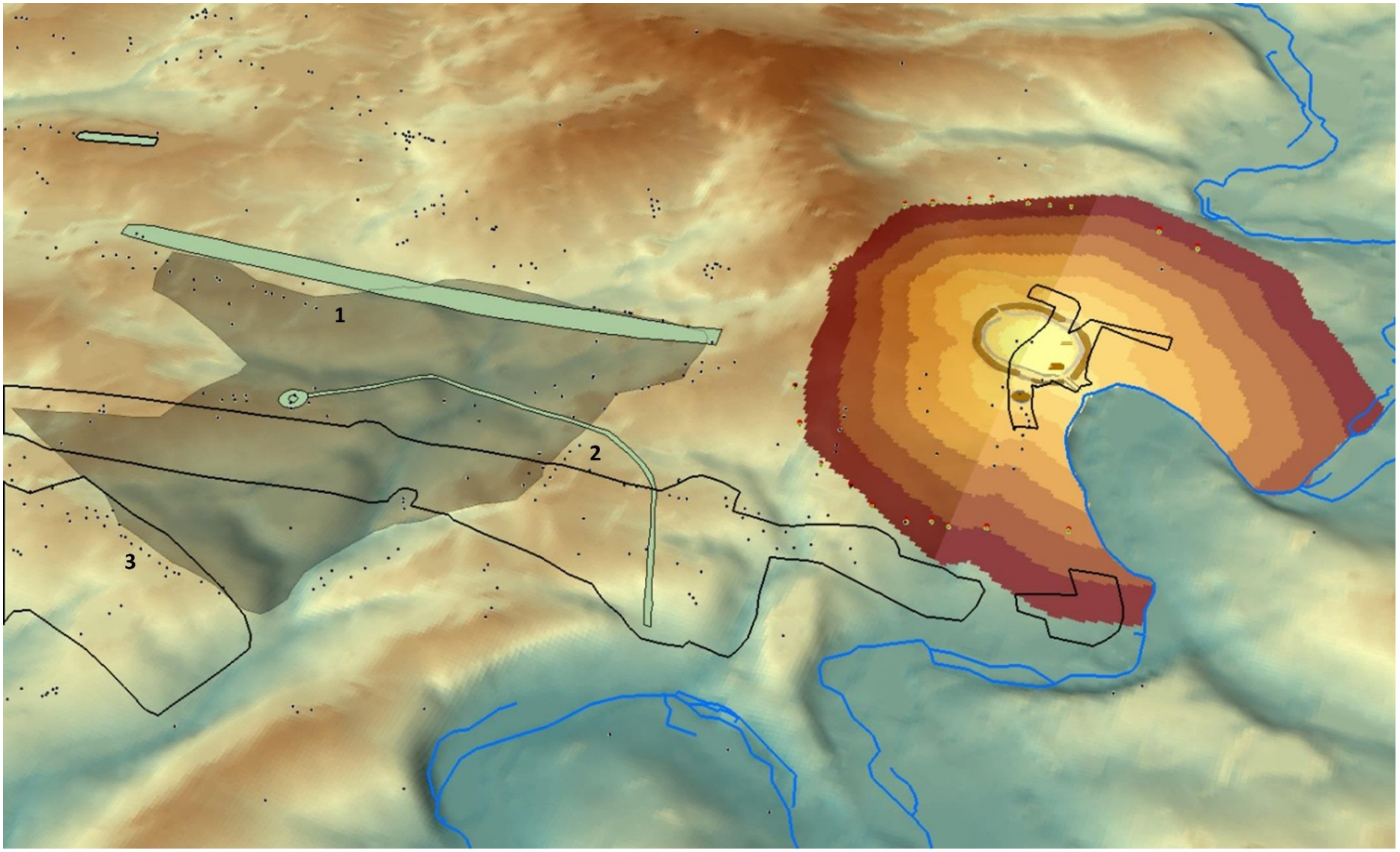

Figure 2. Major monuments plus the Stonehenge Envelope (left and in grey) and the Durrington Pit circle (right)with energy cost surface to emphasise the area under discussion. Highways Agency area of interest shown in black. Numbered barrow groups are (1) The Cursus Group, (2) The King Barrow Ridge groups, (3) The Normanton Down group

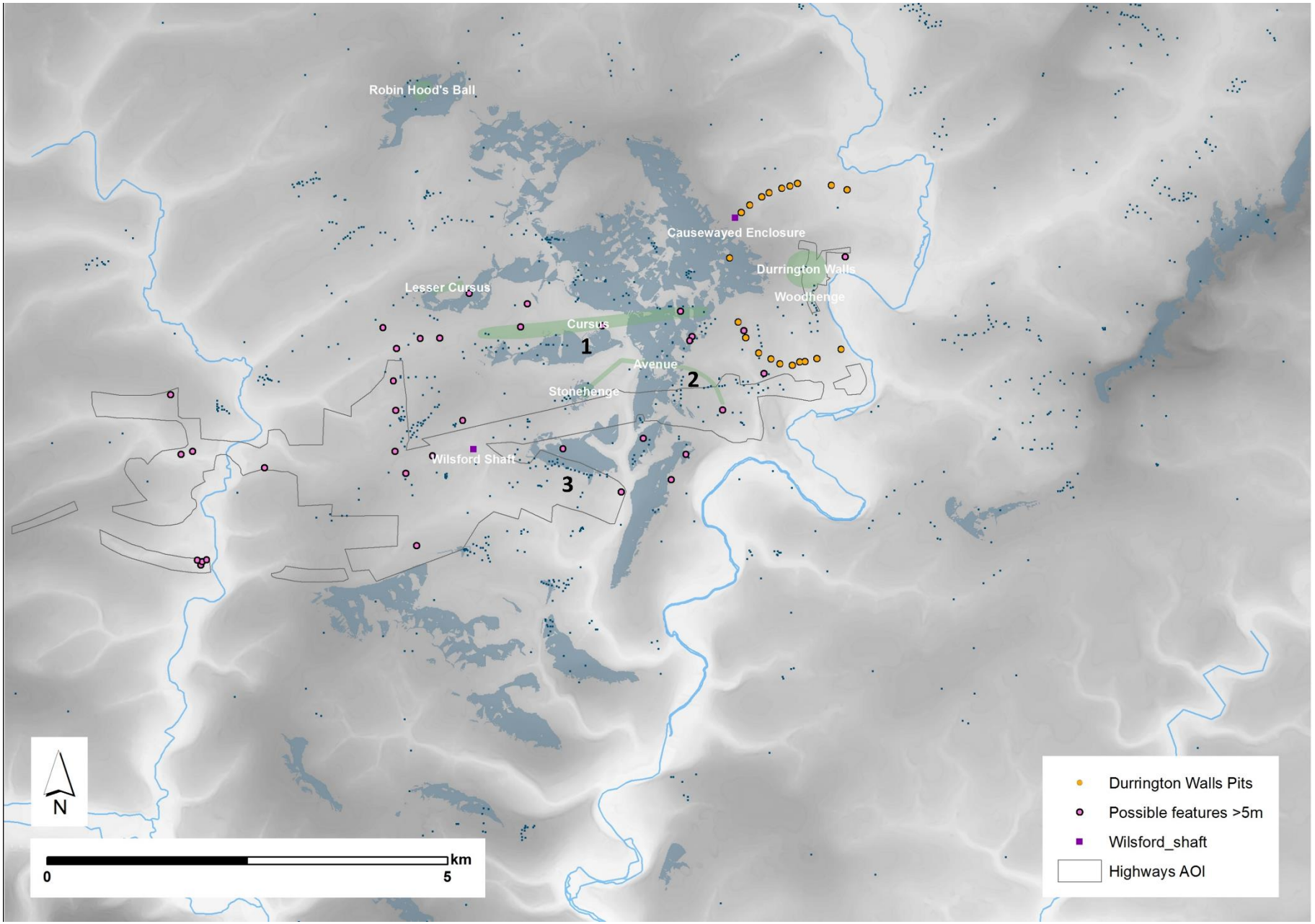

Figure 3. The Stonehenge Viewshed, the Durrington Pit circle and possible features greater than 5m in diameter. Principal monuments are named and other monuments as points. Numbered barrow groups are (1) The Cursus Group, (2) The King Barrow Ridge groups, (3) The Normanton Down group

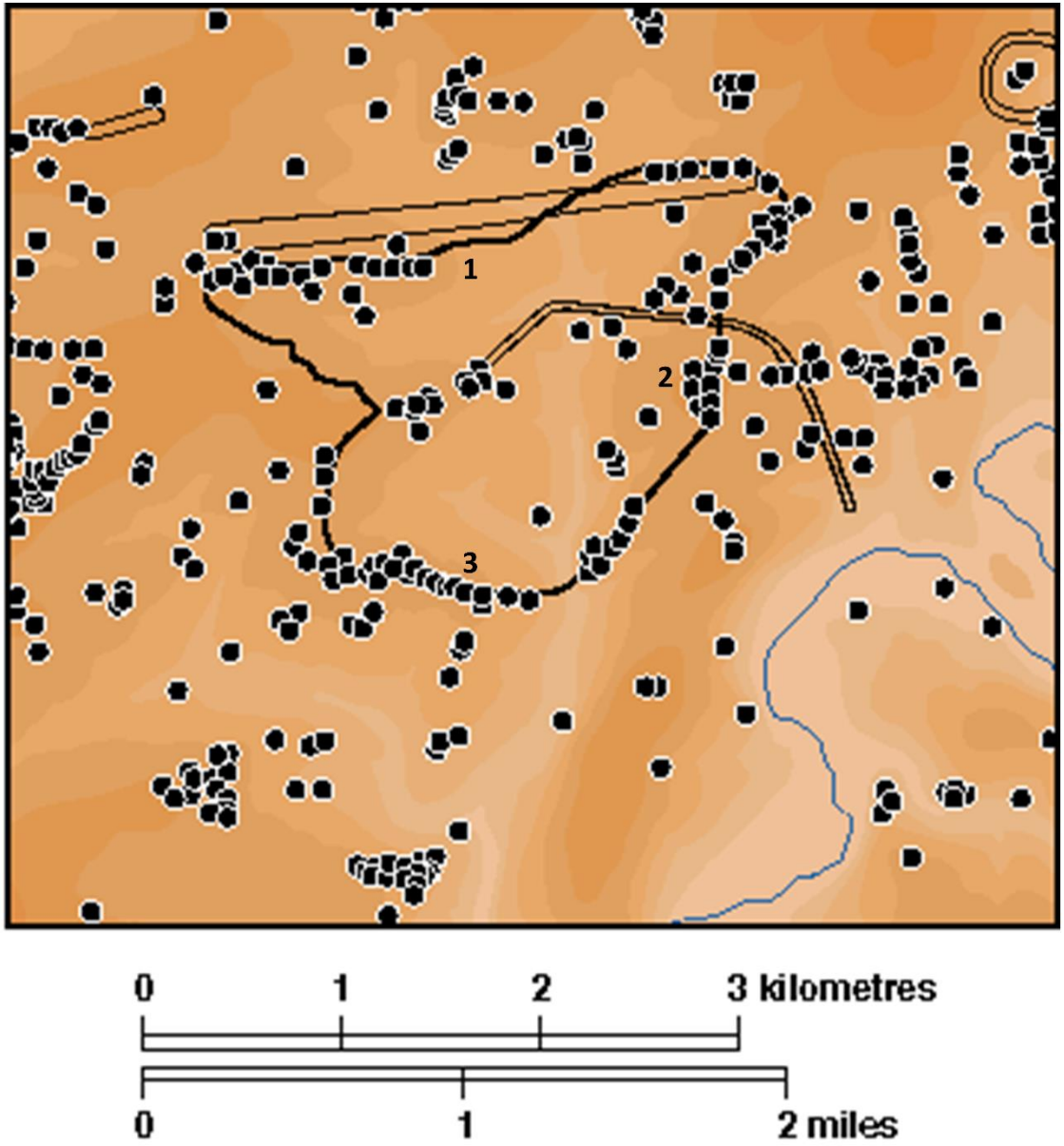

Figure 4. The Stonehenge Envelope and monuments clustering along the edge of near horizons (after Exon et al 2000, figure 8.8). Numbered barrow groups are (1) The Cursus Group, (2) The King Barrow Ridge groups, (3) The Normanton Down group

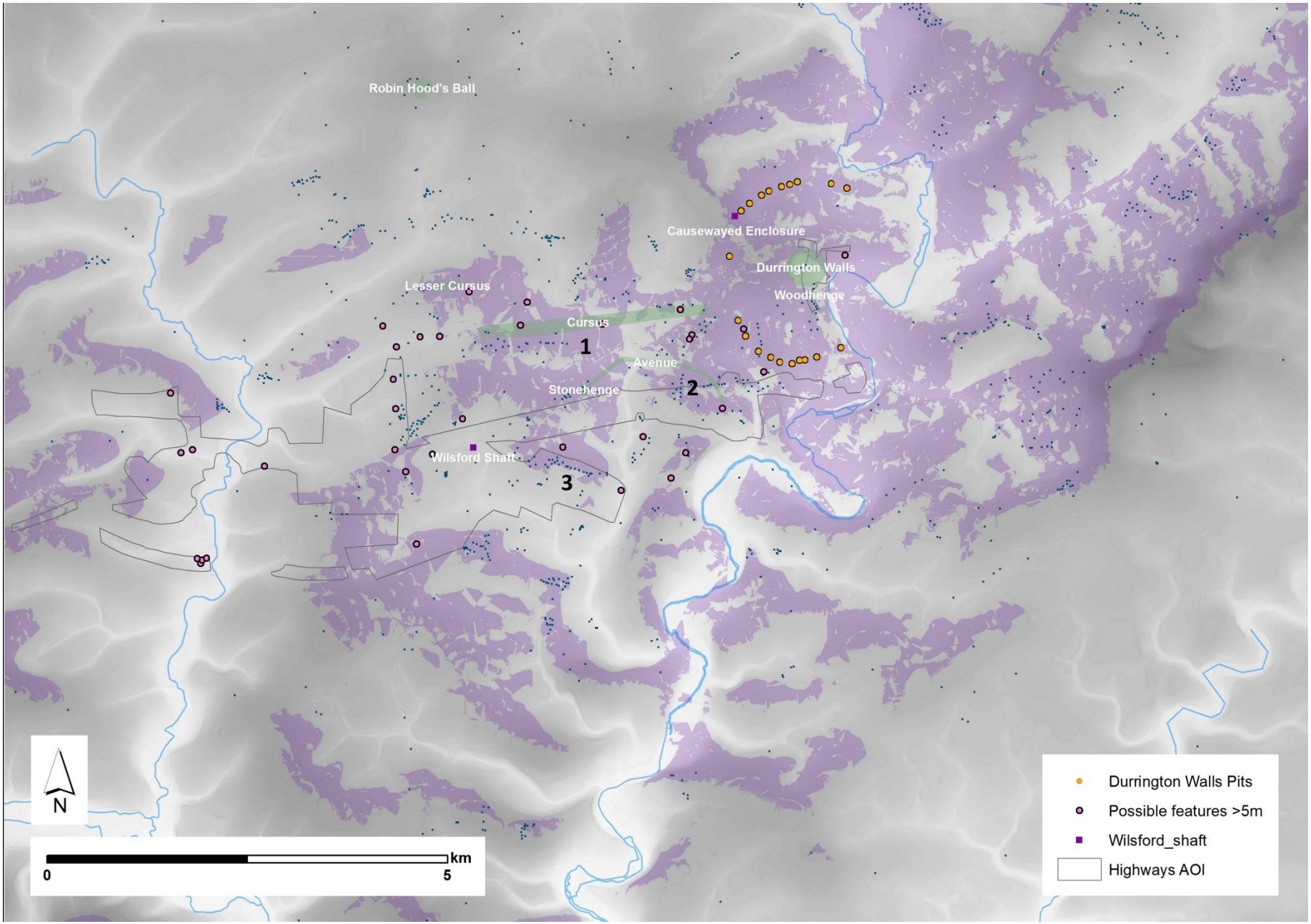

Figure 5. Composite viewshed from the Durrington pit circle with possible features greater than 5m in diameter. Principal monuments are named and other monuments as points. Numbered barrow groups are (1) The Cursus Group, (2) The King Barrow Ridge groups, (3) The Normanton Down group

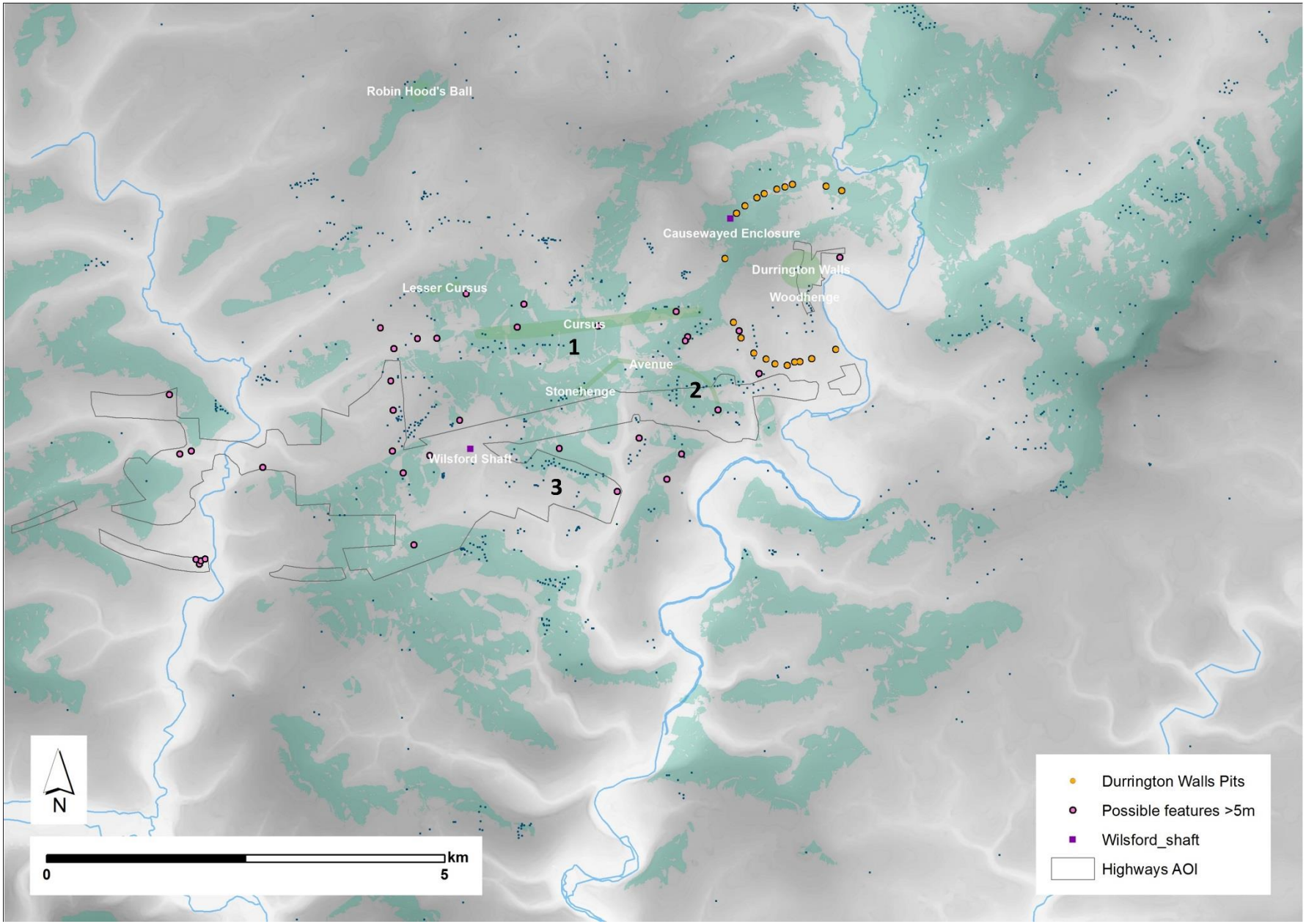

Figure 6. Viewshed from Larkhill causewayed enclosure, with the Durrington pit circle and possible features greater than 5m in diameter. Principal monuments are named and other monuments as points. Numbered barrow groups are (1) The Cursus Group, (2) The King Barrow Ridge groups, (3) The Normanton Down group

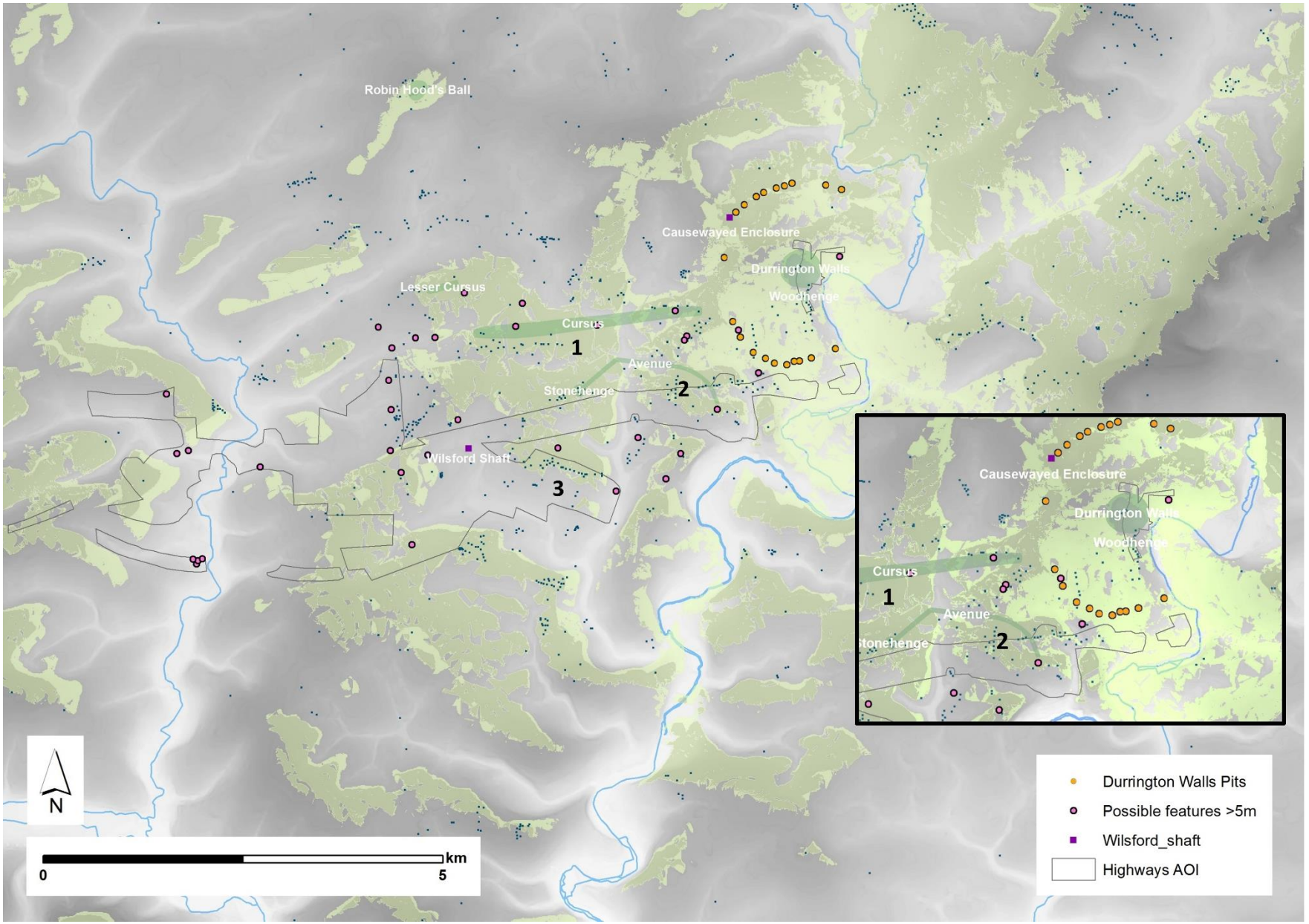

Figure 7. Viewshed from the Durrington Pit circle overlain by Larkhill Causewayed Enclosure with possible features greater than 5m in diameter. Principal monuments are named and other monuments as points. Numbered barrow groups are (1) The Cursus Group, (2) The King Barrow Ridge groups, (3) The Normanton Down group. Inset illustrates likely impact on eastern portal area

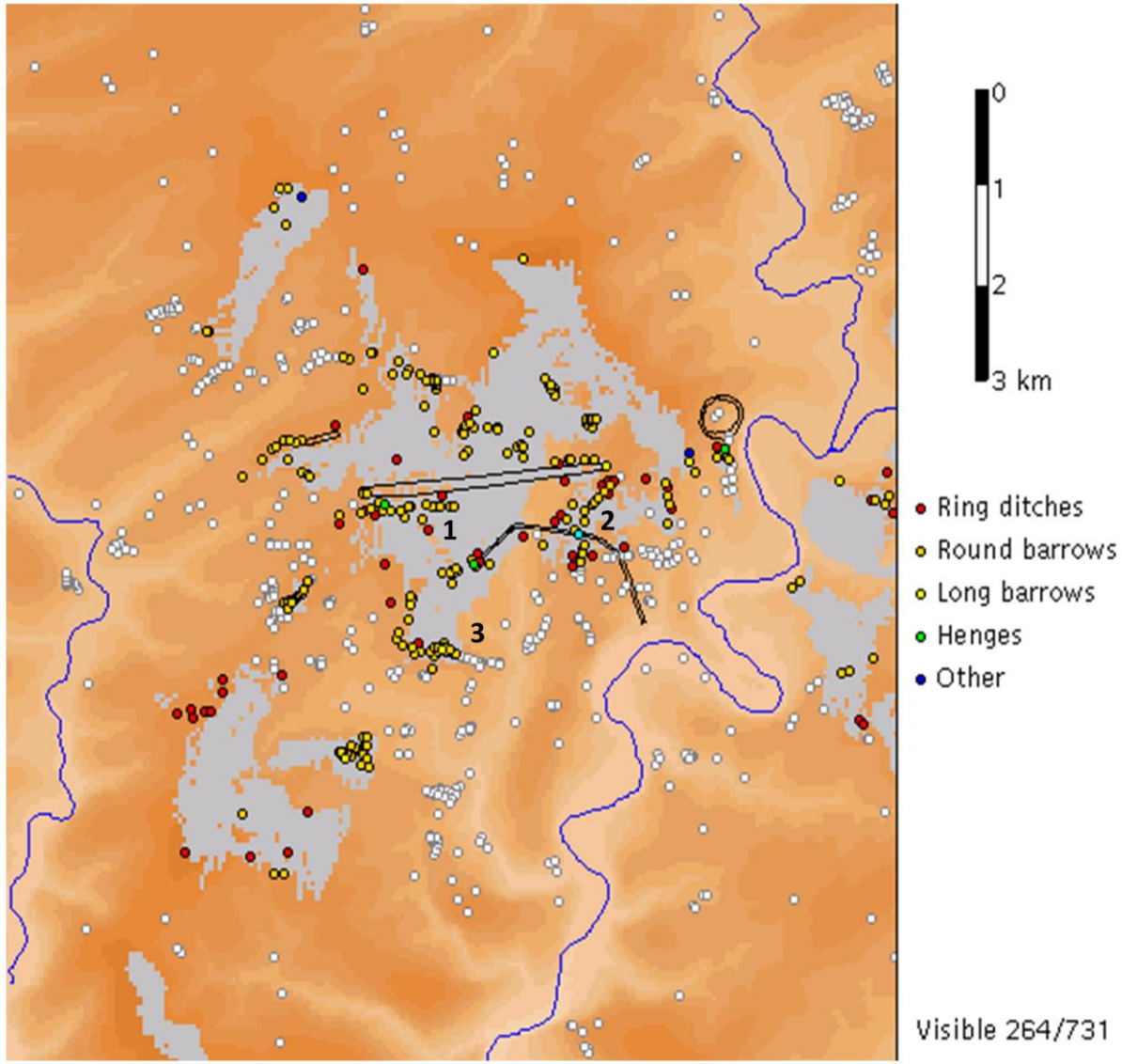

Figure 8. Viewshed from the Avenue at the King Barrow Ridge. Coloured symbols indicate monuments that are intervisible with the viewer. Numbered barrow groups are (1) The Cursus Group, (2) The King Barrow Ridge groups, (3) The Normanton Down group (after Exon et al. 2000, figure 7.4)

Professor Vincent Gaffney MBE FSA
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CURRICULUM VITAE

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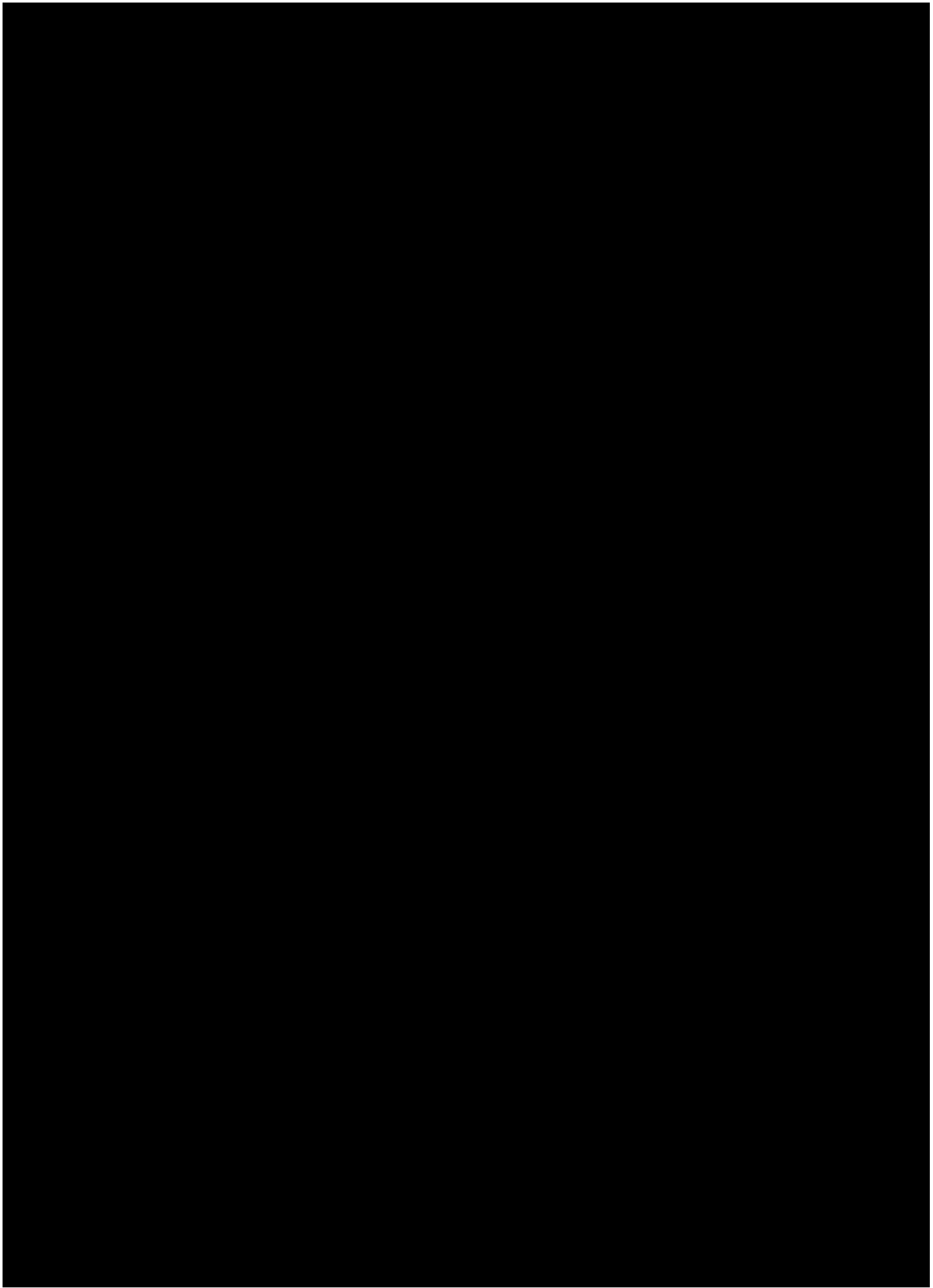
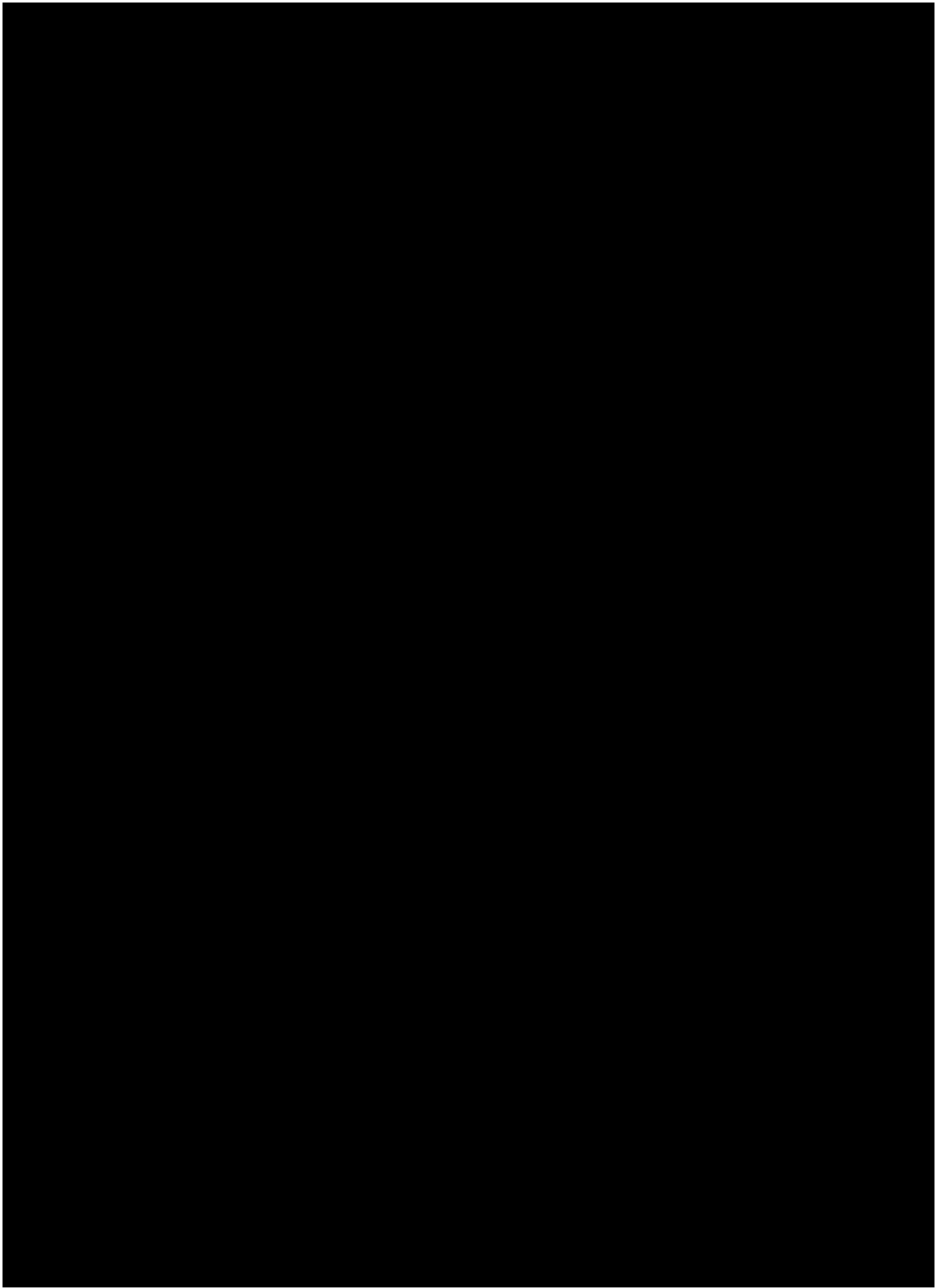




A response to the Secretary of State for Transport requesting views on any implications arising from new discoveries for the A303 development at Stonehenge 16 July 2020

Brian Edwards, Visiting Research Fellow, The Regional History Centre, University of the West of England, Bristol, and Deputy Representative of the Avebury and Stonehenge Archaeological and Historical Research Group (ASAHRG) to the steering group of the Stonehenge, Avebury and Associated sites World Heritage Site (WHS).

Reference number: 20020830

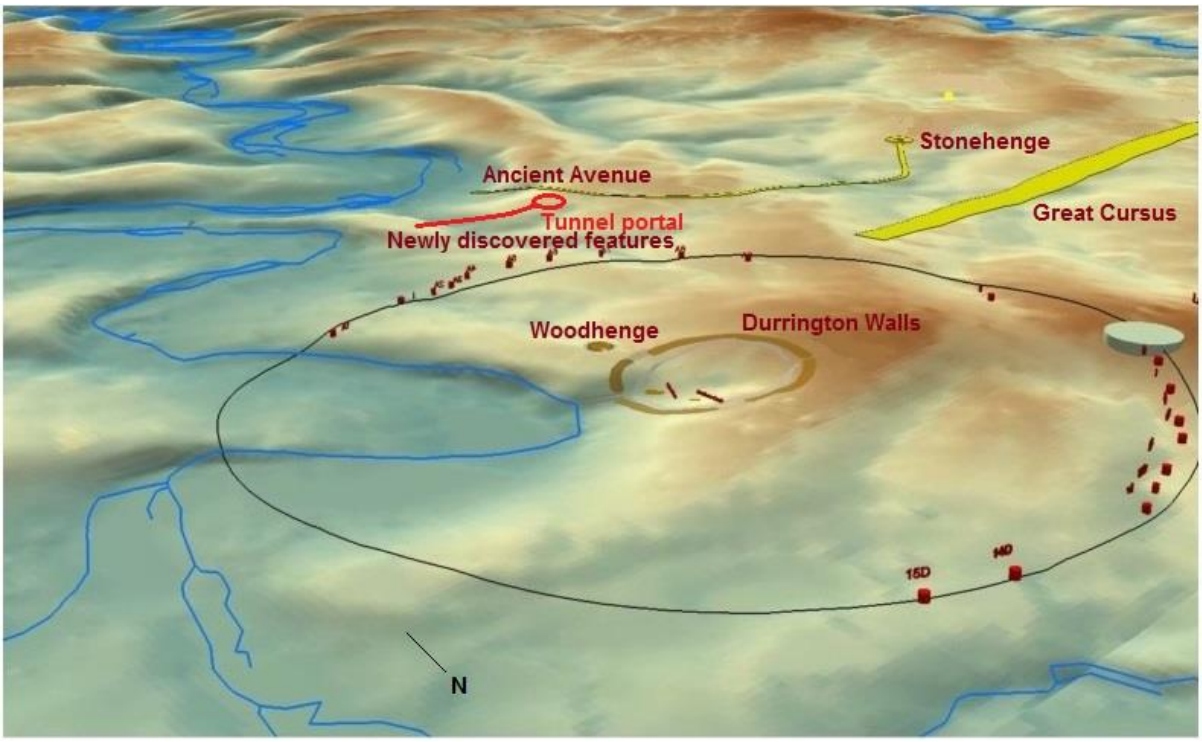
10 August 2020

Summary
In responding to the first of the Secretary of State's requests, it is explained how the new discoveries highlight that the proposed location of the eastern tunnel portal would compromise the Outstanding Universal Value (OUV) of the World Heritage Site.

Introduction
This response is to the first of the requests from the Secretary of State for Transport for views on any implications for the Development and any harm it may cause to the WHS, and on the Applicant's Detailed Archaeological Mitigation Strategy (DAMS),[1] in light of the recent announcement of an archaeological discovery within the WHS of 'A Massive, Late Neolithic Pit Structure associated with Durrington Walls Henge'.[2]

Reference will also be made to other WHS relevant discoveries.

Location: Fig.1.



Adapted from an image reproduced with the kind permission of the University of Bradford.

Outstanding Universal Value (OUV)
In respect of these discoveries it is of fundamental importance to recall, that UNESCO defines Outstanding Universal Value (OUV) as: "cultural and/or natural significance which is so exceptional as to transcend national boundaries and to be of common importance for present and future generations of all humanity." [3]

Operational Guidelines issued by UNESCO explain that it is certain significant attributes that define the OUV of a World Heritage property. [4]

Attributes of OUV
Defining the attributes expressing OUV in the Statement of OUV for the WHS assists with understanding what is needed for the protection of the WHS and its OUV:

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 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 Neolithic and Bronze Age funerary and ceremonial monuments and their landscape settings on architects, artists, historians, archaeologists and others.

1. Implications for the Development and any harm it may cause to the WHS

1.1. The existence and dating of the pits show them to be associated with most, if not all, of the Attributes of OUV of the WHS.

1.1.1. In view of the new discoveries, recognition of the existence and relative positions of the Durrington Walls pits to the Avenue is sufficient to highlight that the proposed site of the eastern tunnel portal, together with accompanying noise and exhaust plume from a far busier, faster A303, would compromise the OUV of the WHS.

1.2. It is evident from the scale of the Durrington Walls pits that they were a significant presence in the landscape. Awareness of these features could have been experienced in many ways varied by any number of factors, but consciousness of them was not necessarily reliant on visual features such as upstanding poles.

1.2.1. Through subsequent discovery, the Durrington Walls pits have been found to be integral to a vista with a distinct topographical relationship to an extensive stretch of the Avenue.[5]

1.2.2. The relationship of the Durrington Walls pits to both the eastern vista of the WHS and the Avenue, underlines that these subterranean features are elements of Attribute 6 of OUV of the WHS (see above).

1.2.3. This vista comprising the monumental landscape to the east of Stonehenge has long been of a particular interest to antiquaries and writers, so meets Attribute 7 of the OUV of the WHS (see above).

1.2.4. An obvious example can be drawn from William Stukeley (1687-1765).

Fig.2.

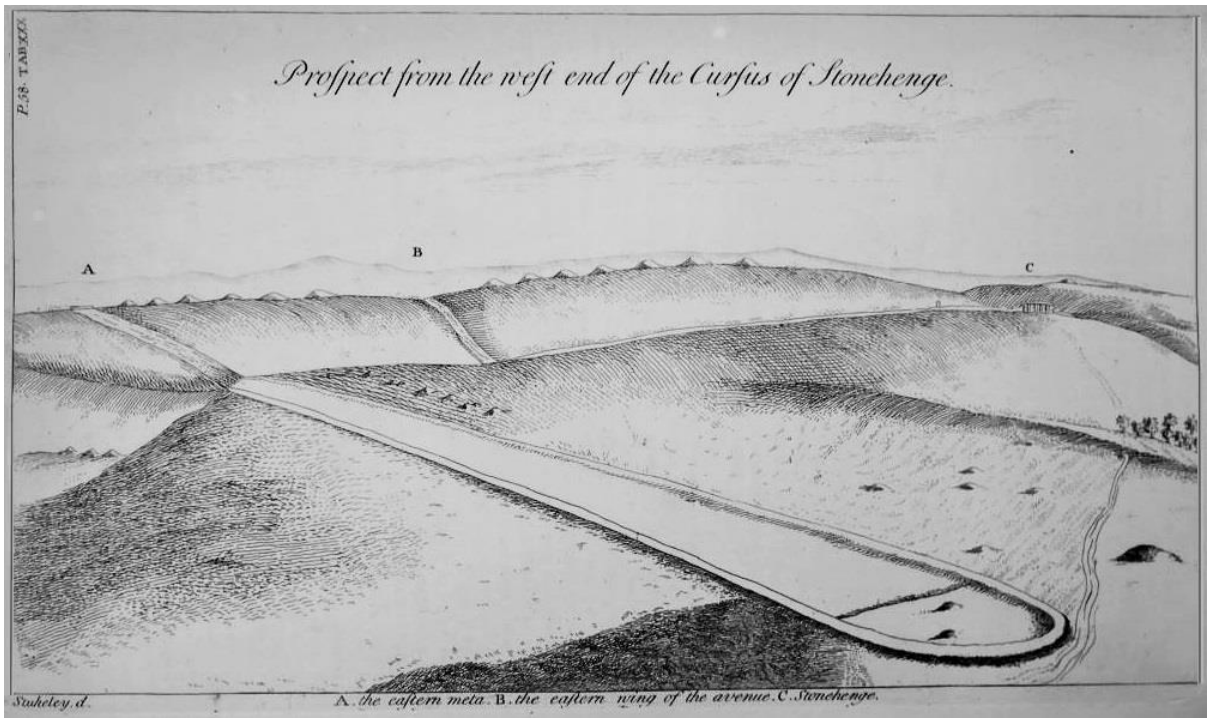
William Stukeley, 1740, 'Prospect of Stonehenge from the East by Vespasian's Camp'.

1.2.4.1. Stukeley's interest detailed in such as his plan of a 'Prospect of Stonehenge from the East by Vespasian's Camp' (Fig.2),[6] and his commentary highlight the clarity of visibility that can be drawn from this sector of the WHS:

'I suppose the end of the avenue upon the hill North of Vespasians Camp northwest from Amesbury church. Here the horizon opens from Northwest to Southeast to the Avon so that you may see down the river nearly to New Sarum & upwards with all the hilltops east of Amesbury conspicuous for a great distance, it takes in a long scene of country considering tis not the highest ground hereabouts, but then tis near the river where their groves were, & has a fine gentle rise for half a mile & more. The hedges hereabouts towards the river are charmingly adornd with viorna. & Avon is a delightful river flankd on both sides thick with villages & good land at the skirts of the downs.'[7]

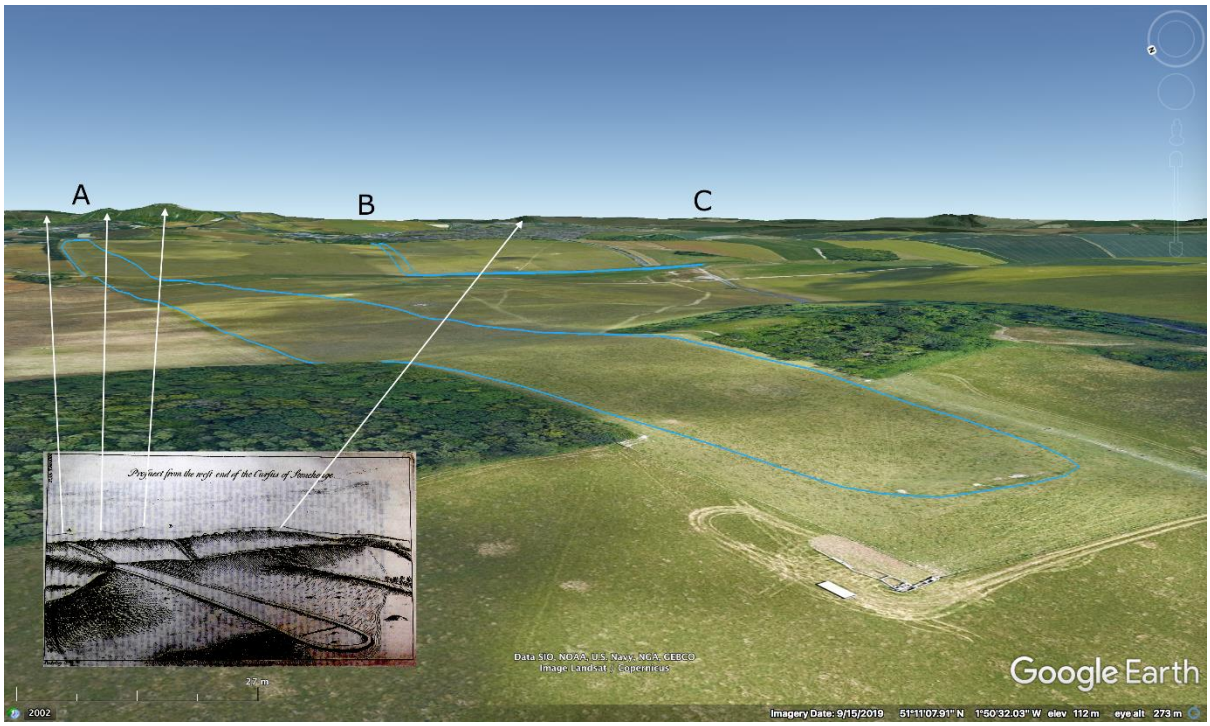
1.2.4.2. The clarity with which the surviving monuments were readily related to the topography and skyline, is also evident in Stukeley's 'Prospect from the west end of the Cursus of Stonehenge' (Fig.3.),[8] in which the antiquary recorded the eastern horizon between the eastern terminus of the Cursus and what he refers to as the 'eastern wing of the avenue' (Fig.4.).

Fig.3.



William Stukeley, 1740, 'Prospect from the west end of the Cursus of Stonehenge'.

Fig.4.



Google Earth image 2002 incorporating an insert of Stukeley's 1740, 'Prospect from the west end of the Cursus of Stonehenge'.

1.2.4.3. The expectation of his peers in respect of the accuracy and potential of this survey, is recalled through such as his friend Roger Gale (1672-1744) hoping Stukeley will 'come home like another Columbus from the discovery of a new world'.[9] In a way he did, not least as Stukeley was the first to highlight that the Avenue 'answers to the principal line of the whole work, the north-east, whereabouts the sun rises, when the days are longest'.[10] He further added that 'the intent of the founders of Stonehenge, was to set the entrance full north east, being the point where the sun rises, or nearly, at the summer solstice'.[11] Recalling Gale's heightened anticipation, David Haycock also cites the scientist William Derham (1657-1735) urging Stukeley to reveal 'whence these stones were brought, and by what carriage and mechanism'.[12] In short, this eastern sector stretching between the Avenue, Durrington Walls and the course of the Avon, with its characteristic skyline beyond, isn't just fundamental to understanding the prehistoric landscape but demonstrates that the nature of this discovery and its acceptance are important.

1.2.5. As noted by John Soul (1866-1942), Vespasian's Camp was adopted for overnight vigils prior to travelling to Stonehenge for the summer solstice in the interwar period, something the eastern vista evidently played a significant role in. The author of several works on Amesbury and also Stonehenge, Soul initiated in 1921 a specific interest in remains at Vespasian's Camp which was eventually scheduled on 2 May1940. The overnight vigil in the east apparently complemented an interwar solstice ritual that terminated to the west following the solstice.[13]

1.2.6. The Durrington Walls pit vista being in view for an extensive stretch of the Avenue until, turning at King Barrow Ridge, it is replaced by a vista which includes Stonehenge, highlights that these subterranean pit features might once have had an acknowledged if not spontaneous relationship to the upstanding stone monument. This relates the Durrington Walls pits to Attribute 1 of OUV (see above).[14]

1.2.7. Furthermore, it can be shown that Stonehenge and Durrington Walls henge are linked to each other via avenues and the river. Therefore it could be argued that this also lends credence to the possibility that the Durrington Walls pits were also thus both spatially and understood to be associated with the Stone monument.

1.3. The discovery of the Durrington Walls pits has recently been complemented by another widely acclaimed discovery, that of the 'Origins of the sarsen megaliths at Stonehenge'. [15]

1.3.1. The location of West Woods being promoted as the original location of the vast majority of Stonehenge's sarsen megaliths, has resulted in discussion surrounding two potential routes for their possible transportation by human effort between these sites: a route requiring either the ascent of the very steep slope of the scarp of the Plain, or the river valley route along the Avon.[16] The southern arc of the Durrington Walls pits would have been the setting of the last leg of the latter, easier route.[17]

1.4. An increasingly noticeable factor in respect of knowledge is that since inscription, in 1986, there have been continual archaeological discoveries in relation to the WHS.[18] Whether in the field or the archive, these discoveries more often than not give rise to a need to revisit interpretation, in turn leading to the re-examination of archaeological records and antiquarian researches in context in the landscape. Advances in technology add yet another dimension,

and this continual process consistently highlights that it is the whole of the WHS and its setting that is important, not merely the central focus and fame associated with the stones.

1.4.1. In contrast, the proposal of a destructive short tunnel in relation to the A303 at Stonehenge that arose during this same period,[19] has inevitably seen spiralling costs as the design was repeatedly altered in length and construction as successive attempts wrestled with the inherently destructive nature of its creation. That the road scheme has been prioritised, without any advance in understanding, over what is actually important about the WHS, could not have been made more obvious in the response of Highways England to the Durrington Pits discovery:

'This find is in the north east corner of the World Heritage Site, well outside the scheme boundary and at its closest point half a kilometre north of the planned A303 upgrade past Stonehenge.'[20]

Notes:

[1] Letter 16 July 2020 https://infrastructure.planninginspectorate.gov.uk/projects/south-west/a303-stonehenge/
[2] Gaffney, Vincent., Eamonn Baldwin, Martin Bates, C. Richard Bates, Christopher Gaffney, Derek Hamilton, Tim Kinnaird, Wolfgang Neubauer, Ronald Yorston, Robin Allaby, Henry Chapman, Paul Garwood, Klaus Löcker, Alois Hinterleitner, Tom Sparrow, Immo Trinks, Mario Wallner and Matt Leivers, 2020, 'A Massive, Late Neolithic Pit Structure associated with Durrington Walls Henge', *Internet Archaeology* 55 https://intarch.ac.uk/journal/issue55/4/index.html
[3] UNESCO, 2019, *Operational Guidelines for the implementation of the World Heritage Convention*, Paris: UNESCO World Heritage Centre, paragraph 49.
[4] *Ibid*, paragraphs 78, 82–4, 88, 99 and 100.
[5] Banton, Simon., 2020 'Avenue Walk and the Durrington Walls Pits', *Stonehenge Monument blog*, 24 July 2020 http://www.stonehengemonument.co.uk/2020/07/avenue-walk-and-durrington-walls-pits.html.
[6] Stukeley, William., 1740, 'Prospect of Stonehenge from the East by Vespasian's Camp' in *Stonehenge, A Temple Restor'd to the British Druids*, London: W. Innys, R. Manby, p.4. TAB. III.
[7] Burl, Aubrey., and Neil Mortimer, eds., 2005, *Stukeley's 'Stonehenge': An Unpublished Manuscript, 1721-1724*, New Haven and London: Yale University Press, pp. 91-2.
[8] Stukeley, William., 1740, 'Prospect from the west end of the Cursus of Stonehenge', op. cit., p.58. TAB. XXX.
[9] Roger Gale to William Stukeley, July 1723, cited by Haycock, Stephen Boyd., 2002, *William Stukeley: Science, Religion and Archaeology in Eighteenth-Century England*, Woodbridge: The Boydell Press, pp. 122-123.
[10] Stukeley, William., op. cit., p.35.
[11] *Ibid*, p.56. Cited by Atkinson, R. C. J., 1985, 'William Stukeley and the Stonehenge sunrise', J*ournal for the History of Astronomy,* Vol. 16, Archaeoastronomy Supplement No.8., pp. 61-62.
[12] William Derham to William Stukeley, 22 February 1726, in Nichols, John., 1817, *Illustrations of the Literary History of the Eighteenth Century*: *Consisting of Authentic Memoirs and Original Letters of Eminent Persons*,… Vol. II, p.799. Cited by Haycock, 2002, *William Stukeley*, pp. 122-123.
[13] 'The Solstice at Stonehenge', *Western Gazette*, 28 June 1935, p.12. 'Summer Solstice. Druidical Ceremony at Stonehenge', *Taunton Courier and Western Advisor*, 20 June 1942, p.2. Stout, Adam., 2008, *Creating Prehistory: Druids, Ley Hunters and Archaeologists in Pre-War Britain*, Oxford: Blackwell Publishing, p. 133. Historic England, Scheduled Monument list entry for Vespasian's Camp. https://historicengland.org.uk/listing/the-list/list-entry/1012126
[14] As most recently discussed by English Heritage's Senior Properties Historian Susan Greaney: BBC Sounds, *The Essay*, 30 Jun 2020. https://www.bbc.co.uk/sounds/play/m000khk8 See also Lucas, Phillip Charles, 2007, 'Constructing Identity with Dreamstones: Megalithic Sites and Contemporary Nature Spirituality', *Nova Religio: The Journal of Alternative and Emergent Religions*, Vol. 11, No. 1, pp. 31–60. Davies, P and J.G Robb, 2004, 'Scratches in the earth: the underworld as a theme in British prehistory, with particular reference to the Neolithic and earlier Bronze Age', *Landscape Research*, Vol. 29, No. 2, pp. 141-151.
[15] Nash, David J., T. Jake, R. Ciborowski, J. Stewart Ullyott, Mike Parker Pearson, Timothy Darvill, Susan Greaney, Georgios Maniatis, Katy A. Whitaker, 2020, Origins of the sarsen megaliths at Stonehenge, *Science Advances* 29 Jul 2020: Vol. 6, No. 31, EABCO133
[16] *Ibid*, p.6.
[17] Hill, Patrick Arthur., 1961, 'The Sarsens of Stonehenge: The Problem of Their Transportation', *The Geographical Journal*, Vol. 127, No. 4, pp. 488–492, esp. 489-490. Parker Pearson, Mike, and Ramilisonina, 1998, 'Stonehenge for the Ancestors: the stones pass on the message', *Antiquity* 72, pp. 308-326.
[18] See for example *Wiltshire Archaeological and Natural History Society Magazine* 1986-2020. Minutes of the Avebury and Stonehenge Archaeological and Historical Research Group 2014-2020. Darvill, Timothy, 2012, *Research Activity in the Stonehenge Landscape 2005-2012*, Salisbury: Historic England and Wessex Archaeology. Darvill, Timothy, 2005, *Stonehenge World Heritage Site: An Archaeological Research Framework*, London and Bournemouth: English Heritage and Bournemouth University. http://www.stonehengeandaveburywhs.org/management-of-whs/
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[20] Highways England, 2020, 'DCO decision delayed until November', 16 July 2020. https://highwaysengland.co.uk/dco-decision-delayed-until-november/

Subsidiary submission of Professor David Jacques, University of Buckingham, Director of the Blick Mead Project

Introduction

Following the urgent notification to the Secretary of State of the significance of the discovery of the monumental array of Neolithic pits around Durrington Walls (document ref no. TR010025-001960), the Planning Inspectorate have invited the Consortium of Archaeologists and the Blick Mead Project Team to make any further representations they wish to assist the Secretary of State to understand the implications of these finds both for the A303 Tunnel scheme, and for the Applicant's obligation to conduct an appropriate Environmental Statement, including the Heritage Impact Assessment (HIA) and the Detailed Archaeological Mitigation Strategy (DAMS).

This invitation was issued on 16 July 2020.

Further submissions are being prepared for the Consortium of Archaeologists directly addressing the significance of the monumental pit circle and other similar pit anomalies in the WHS. This submission is intended to complement the main submissions, addressing the adequacy of the HIA and the DAMS by focussing on very recent scientific results at Blick Mead, the Mesolithic settlement site which lies within the boundaries of the WHS. These scientific results emerged following the close of the Examination.

The new scientific results, together with the new discovery of the monumental pits demonstrate: a. that the survey techniques of Highways England have been wholly inadequate, b. decisions over the positioning of the portals as being somehow 'less sensitive' in heritage terms are unsafe. Further, the new results add to the heritage significance of Blick Mead and emphasise the importance of ensuring that its water table is not damaged.

The New Results

On July 31st 2020 The Blick Mead Project received new, internationally important, data that for the first time dates the soil sequence on its river terrace (see TerrACE report attached). The terrace is important because it links the spring and the edge of the known Mesolithic site, and its subsequent build up potentially tell us much about the way agricultural and cultural practices evolved from this time. The dating technique used was OSL (Murray and Wintle, 2000).

The OSL results were accompanied by new DNA results from the Blick Mead spring which revealed that trace remains of 43 different plant species dating between c. 7500-4700 BC survive in an area protected (presently) by the water table. Both the OSL and DNA work was undertaken by Tromso University's TerrACE (ERC) Project with specialist support from the Blick Mead team. The TerrACE team is world renowned and comprises researchers from eight institutions and universities in five European nations.

OSL results -The results provide a detailed dating sequence of human occupation at Blick Mead from the later Mesolithic (hunter gatherer) period c. 4500 BC, through to the high medieval period (see attached TerrACE report) . The dated sequence, which starts with a preserved late Mesolithic land surface that overlays well- preserved auroch hoofprints under a laid-by-hand stone platform surface , potentially charts land use over several millennia at Blick Mead. This palimpsest is unique for the Stonehenge World Heritage site.

The DNA results are of huge significance due to the context of the antiquity of the plant remains surviving in the sediments in the Blick Mead spring (c. 9500-6700 years old) and what they tell us about the landscape at that time. The Mesolithic has long been seen as 'lost' period in the WHS (See Darvill 2006, 66) and was not in consideration when the WHS was first listed by reference to its Neolithic and Bronze Age heritage. The DNA shows that an environmental record from the Mesolithic is preserved, a great rarity nationally and a first for the WHS. This is very likely to be the case for the other time periods revealed by the OSL dating. We can thus reconstruct how this part of the WHS landscape developed from just after the end of the Ice Age through to the modern period. It may well be possible to extract similarly detailed information from those parts of the WHS that are scheduled for destruction if the scheme proceeds. However, the current HIA and DAMS are not adequate for the task.

The state-of-the-art scientific techniques employed by the TerrACE team, in particular the method for extracting DNA from ancient sediments and the detailed OSL dating of the soil, sets a benchmark for alternate research strategies in the Stonehenge World Heritage Site. Such strategies would significantly add to our understanding of the WHS's OUV.

Please find the interim report on the OSL and DNA results from Blick Mead by the TerrACE team annexed to these submissions. These are preliminary views provided in a short timescale for this consultation. However, the discovery of well-preserved, dated, and continuous environmental sequences at Blick Mead, including a preserved Mesolithic land surface, means that for the first time there is an opportunity to assess how human intervention adapted this part of the WHS landscape from just after the Ice Age through to the medieval period, and beyond.

It is therefore absolutely critical that further archaeological work anywhere in the WHS should be conducted to the highest standards, and should employ the latest international scientific techniques, if it is to enhance the OUV of the WHS as opposed to damaging it. Together with the discovery of the monumental array of Neolithic pits, this discovery underscores the importance of Highways England using all scientific techniques available. Others have highlighted that the discovery of the pits demonstrates that survey techniques used thus far are inadequate. The results at Blick Mead further emphasise what is potentially lost through the failure to use such techniques and to employ 100% sampling.

In particular, the TerrACE team's new techniques for extracting DNA from ancient remains in waterlogged conditions needs to be adopted by Highways and other research teams operating in the WHS. For example, the pit circle detected by Gaffney et al has shafts to the east which will be waterlogged. DNA and OSL techniques would provide more eco facts and

soil sequencing dates for this feature. Our understanding of the Wilsford Shaft, south west of Stonehenge, would benefit similarly.

The latest scientific results from Blick Mead demonstrate that the survey techniques used in this part of the WHS by the Applicant were wholly inadequate. For example, the total areas sampled by the Applicant and its sub-contractors in the Countess area and the attendant side valley, which share the same river terrace as Blick Mead, were 3% and 4% respectively In contrast 100% of the river terrace contexts at Blick Mead have been sampled.

The Applicant's investigations at Countess lack both detail and dating of the soil sequences and therefore fail to map relationships between known archaeological artefacts there. those close to Blick Mead. The difference in adopting a sampling strategy of 100% at Blick Mead and 3-4% on the Countess side, locations only separated by about two hundred metres, is stark. The Blick Mead results have so far revealed a preserved and long-lived Mesolithic occupation (c.8000-4000 BC), ancient DNA of a diverse variety of flora and fauna, a late Mesolithic tree-throw shelter and occupation surface, well-preserved aurochs' hoofprints, plus a tightly dated laid stone surface into the spring. Thanks to TerrACE, we now know there are also preserved post-Mesolithic soil sequences which potentially take the WHS narrative much further. The Countess area investigations by the Applicant are completely inadequate by comparison, yet are the basis for this area of the WHS being given a low archaeological value in the HIA.

With the discovery of the massive Neolithic pit circle being so recent, and its significance only now beginning to be researched, the importance of other pit anomalies in the WHS (but not in the circle formation), thus far dismissed as unimportant by the Applicant, now needs to be completely reconsidered. Some of these pit anomalies will be destroyed without further exploration should the scheme proceed on the basis of the current HIA and DAMS.

The Applicant needs to propose a detailed mitigation strategy for the deposits found in sites with similar characteristics to Blick Mead, namely water-logged sediments, such as in the Wilsford Shaft and other pit anomalies in the road-line. 100% recovery techniques are required for ultra-rare ancient DNA and for preserved faunal and floral remains. Detailed OSL dating of sequences is also required to maximise our understanding of the OUV of this unique landscape.

Other submissions have focussed on the siting of the Western Tunnel Portal. The results at Blick Mead reveal that the assertion that the Eastern Tunnel Portal is sited in one of the least sensitive areas of the WHS is categorically wrong. This is demonstrated by the preserved eco facts found in the Blick Mead spring, both flora and fauna, dating c. 7500-4700 BC, including preserved aurochs' hoofprints (see slide four), and the TerrACE discovery of well-preserved plant DNA of Mesolithic date existing in the sediments of the spring. Further, the discovery of intensive lynchet formations in the Middle Bronze Age and late Roman periods at the site

enables us to investigate lynchets and reconstruct a particular landscape's development for the first time. For example, the latter may relate to changes in the late Roman/early Anglo Saxon agricultural practices in the WHS which at present tend to be understood theoretically due to the paucity of evidence. The paucity of sampling around the Eastern Tunnel Portal means that it cannot be concluded that that area of the WHS does not contain similarly significant material.

Finally, the new results emphasise the sensitivity of Blick Mead and the importance of the water table. This underscores the submissions we have previously made as to the impact of the tunnel on this water table and the potential for an extraordinary resource to be irreparably damaged.

Prof David Jacques, 12.8.20

Blick Mead submission 12/08/2020

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ANNEXE TO SUBMISSION OF PROF D JACQUES

Interim Report by Tromso University TerrACE team - by Professor Tony Brown, et al

The OSL age estimates for trench 24 are in stratigraphic order and shows no indication of insufficient bleaching of the fine grains. Sample SBG077 from a thin clay layer found 97cm BGL produced a Late Mesolithic date (c. 4590±230 BCE). The sequence also suggest some erosion in the Neolithic and/or Early Bronze Age into the underlying Mesolithic landsurface. Overlying this at 71cm BGL was the lower flinty loam (SBG080) dated to the Middle Bronze Age (c. 1430±150 BCE). The higher flinty loam lynchet soil (SBG084) at 43cm BGL was dated to the later Roman period (c. 310±90 CE).

All OSL samples taken from Trench 28 are within stratigraphic order and are well bleached. The lowermost sample at 160cm BGL was dated to the Middle Bronze Age (c. 1375±150 BCE). Overlying this at 120cm BGL was the lower flinty loam deposit (SBG090) dated to the Roman period. Sample SBG094 obtained from the higher flinty loam lynchet soil (50 cm) (was dated to the Early Medieval period (c. 1060±40 CE). Overlying this deposit at 30cm BGL was a continuation of the lynchet soil (SBG096) dated to the Medieval period (c. 1480±20 CE).

The re-analysis of new samples for DNA from the basal silty clays of trench 19 has revealed the presence of 43 plant types including, trees, shrubs, grasses, and forbs (flowering plant that is not a graminoid). The trees are comprised of poplar, willow, with lime and alder in the upper levels and the shrubs of dogwood, apple and rose family. Of the wide range of forbs the most important are several indicators of nutrient-enhanced open ground including daisy family, plantain, buttercup clover, meadow-pea and stinging nettle as well as an expected wetland flora. Given the mixture this suggests that this is an opening in the deciduous forest associated with grazing, probably given the date by deer and aurochs, from the 7th millennium BC.

<u>Implications of the results</u>

Firstly, at Blick Mead, there is a later Prehistoric environmental record (Middle Bronze Age) and also a late-Roman/Medieval record. Both of these periods are represented in the immediate off-site archaeology. Secondly, it appears that along with the excellent preservation of bone and other environmental proxies, the site has preserved environmental DNA.

July 2020 -*Tony Brown, Lisa Snape, Sam Hudson, Andreas Lang, Inger Alsos, Ben Pears and Dan Fallu*