Hanson Aggregates UK

Westdown Quarry

Regulation 25 Additional Information

Wood Group UK Limited – June 2022

Report for

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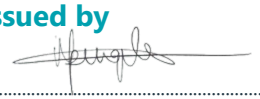

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Document revisions

No.	Details	Date
1	Final	June 2022

Contents

Appendix A	Previously submitted applicant's rebuttal to other material planning considerations raised by the public (September 2021)
Appendix B	Hanson Asham Wood Woodland Management Plan
Appendix C	HEP calculations for greater and lesser horseshoe bats
Appendix D	Draft Heads of Terms for Section 106 Agreement relating to traffic
Appendix E	Hanson's 'Committed to reaching net zero carbon by 2050' and 'Carbon Capture Plan'

1. Introduction

1.1 Background

1.1.1 Hanson Aggregates UK (hereafter referred to as Hanson) are seeking to reopen Westdown Quarry. A consolidating planning submission and supporting Environmental Statement was submitted to Somerset County Council (SCC) in February 2021 and remains with SCC for determination.

1.1.2 The consolidating planning submission was registered by SCC as four planning applications:

- **SCC/3838/2021/ROMP** - An application in respect of the following Review of Mineral Planning Permission (ROMP) consent for the determination of mineral planning conditions made under the Environment Act 1995 at Hanson's Westdown Quarry: - ROMP reference 016248/0051 for the winning and working of limestone – Approval of Schedule of Conditions dated 4 November 1998. This ROMP consolidated two separate parcels of land to the north-east of IDO/M/1/A and an area within the south-west of IDO/M/1/A, collectively covering an area of~14ha.
- **SCC/3795/2021** - Works ancillary to the operation and restoration of Westdown Quarry, including the construction of an upgraded access, on land that sits outside the ROMP and IDO boundaries.
- **SCC/3836/2021/IDO** - An application in respect of an Interim Development Order (IDO) consent for the determination of mineral planning conditions made under the Planning and Compensation Act 1991 at Hanson's Westdown Quarry (incorporating an area known as Asham Wood Void): IDO permission reference IDO/M/1/A (original planning reference 70 - dated 1 November 1947) registered as an IDO on 23 October 1992. This covers the main Westdown Quarry area and extends across an area of ~54ha.
- **SCC/3837/2021/IDO** - An application in respect of an Interim Development Order (IDO) consent for the determination of mineral planning conditions made under the Planning and Compensation Act 1991 at Hanson's Westdown Quarry (incorporating an area known as Asham Wood Void): IDO permission reference IDO/M/4/A (original planning reference 1492 - dated 28 June 1948) registered as an IDO on 27 October 1992. This permission covers the Asham Wood Void area and extends across an area of~32.3ha.

1.1.3 Three of the above applications relate to IDO and ROMP submissions, where permission has previously been granted for mineral extraction and that, therefore, the principle of mineral extraction at the site is established. The fourth application is for non-extractive, ancillary operations on land outside but adjoining the IDO/ROMP boundaries. Notwithstanding this, it is also essential that new schemes of planning conditions for the IDO/ROMP permissions are prepared in full cognisance of the likely significant environmental impacts that will arise through the undertaking of a thorough EIA process and the submission of a full Environmental Statement.

1.1.4 The following documentation was submitted to SCC in February 2021 to support the consolidating planning submission and thus relates to all four of the planning applications identified above:

- Planning Statement;
- Environmental Statement;
- Flood Risk Assessment;
- Habitats Regulation Assessment; and
- Transport Assessment.

1.2 Purpose of this report

1.2.1 This report has been prepared in response to the request by SCC, as set out in their letter dated 1st April 2022, for further information to be provided under Regulation 25 of the Town and Country Planning (Environmental Impact Assessment) Regulations 2017.

1.2.2 The information has been requested to allow SSC, as the Mineral Planning Authority, to assess the applications in light of a full and robust Environmental Statement. In their letter dated 1st April 2022, SCC indicated that the following matters would need to be addressed:

- Ecology;
- Highways;
- Hydrology and hydrogeology;
- Noise and blasting;
- Dust and air quality;
- Rights of way; and
- Restoration.

1.2.3 Each of the above matters are addressed individually in the subsequent chapters of this report.

1.2.4 Where appropriate, cross reference has be made to clarification information previously submitted by the applicant – Hanson and their consultants Wood Group UK Ltd (hereafter referred to as Wood) – to SCC in response to comments submitted by statutory consultees on the Westdown planning applications. Specifically this relates to clarification information submitted in response to comments by Natural England, Highways Authority, Local Lead Flood Authority (LLFA), and SCC's County Ecologist. Original responses have been reviewed and updated as required and are included in this report.

1.2.5 All other material planning considerations raised in response to the applications by the public have been rebutted as part of an earlier submission to SCC dated 14 September 2021. A copy of this submission is enclosed in **Appendix A** but can also be accessed from Hanson's Whatley and Westdown Quarries community webpage (https://www.hanson-communities.co.uk/en/whatley-and-westdown-quarry-community-page/documents).

2. Ecology

2.1 Introduction

Regulation 25 request

2.1.1 In their letter SCC state:

"The County Ecologist, Natural England along with Somerset Wildlife Trust and others consider that significant additional information is necessary to ensure that there will not be significant impacts on protected species, with particular reference to horseshoe bats.

It is accepted that no mineral extraction is proposed with Asham Wood but the proposed restoration scheme will impact on land adjacent to this which has naturally regenerated since operations temporarily ceased some years ago.

It is noted that a rebuttal document dated 14th December 2021 was submitted in response to the range of ecological concerns raised by the County Ecologist. I am unsure whether this been sent out to consultation and it may be that this document is referred to in your response to this letter if you do not wish to add anything further on the subject of ecology.

However, in order to progress these applications to a positive conclusion it will be necessary to overcome the objections raised by the County Ecologist and Natural England to ensure that the proposal does not have significant impacts on protected species and designated SSSIs and SACs in the locality of the site. Should you wish to add to/amend your December 2021 document then please do so or if you still would like a meeting then please confirm this as soon as possible."

Previously submitted clarification information

2.1.2 A response to Natural England's comments (June 2021) on the Westdown planning applications was submitted to SCC in July 2021.

2.1.3 In October 2021, Somerset Ecological Services (SES) provided comments on the proposed reopening of Westdown Quarry. A detailed rebuttal to SES's comments was submitted to SCC by Hanson/Wood in December 2021. A further response from SES in response to the Hanson/Wood rebuttal was received in January 2022 and formed the basis for a Teams meeting held on 20th January 2022 between SES (Leanne Butt), SCC planning officers (the then SCC case officer, Philip Millard, Helen Vittery, and Colin Arnold), and relevant Hanson/Wood staff.

2.1.4 Where appropriate, the clarification information previously submitted has been reviewed and updated as required in the following sections which seek to address the objections by the Natural England and the County Ecologist/SES.

2.2 Response to Natural England

Mells Valley Bats SAC

2.2.1 In their response Natural England indicate that *"It is not clear from the HRA or HEP report that a sufficient consideration has been given to the risk to bats or the Mendip Woodland SAC features over such a long duration of active mineral works, exacerbated by the episodic restoration of Asham Void and establishment of replacement bat habitat during phases 1-4"*. Furthermore, Natural England go on to indicate they are unable to locate the 18 hectares (ha) of off-site habitat provided and state that this off-site habitat provision is being interpreted as temporary mitigation by Natural England.

2.2.2 In response to these points, it should be highlighted that Hanson has sought to work closely with Natural England throughout the preparation of the consolidating Westdown planning submission to agree the scope and methodology for surveying and assessing the short- and long-term effects that the recommencement of working at the quarry will have on the areas greater and lesser horseshoe bat population. Indeed, the site has been carefully designed to ensure that any potential effects on these species are minimised and mitigated as far as possible. This has included the standing off from significant areas of land through detailed design iterations to avoid areas of potential concern such as that of Fordbury Water.

2.2.3 As set out in the Environmental Statement (ES) chapter on biodiversity, ES Chapter 11 (Sections 11.11 to 11.14, and 11.21), it is recognised that the proposed development has the potential to affect bats – both greater and lesser horseshoe bats – as well as the Mells Valley Bats SAC. A detailed bat baseline report is provided in ES Appendix 11B. Indeed, as recognised in Natural England's response, the scope of the numerous and detailed bat surveys which have been conducted was agreed with Natural England. This was done via Natural England's Discretionary Advice Service (DAS) on three occasions. ES Appendix 11B Bat Baseline Report (see paragraphs 3.1.6 to 3.1.8) provides details of all bat surveys carried out at the application site and which have informed the ES. The documented consultation of the DAS consultations is presented in Appendix D of ES Appendix 11B. Furthermore, the comments made by Natural England in response to the request for a formal scoping opinion by Hanson to Somerset County Council (SCC) in May 2020 were considered as detailed in both the Planning Statement and ES Chapter 11.

2.2.4 In terms of assessing the effects on the re-commencement of quarrying operations at Westdown Quarry, this has been done to reflect the short-, medium- and long-term effects on all biodiversity receptors – including the SAC. The temporal scope of the assessment set out ES Chapter 11 covers each phase of the proposed extraction, as well as the long-term effects on the local bat population once the site has been restored (both partially and fully). In total therefore, the assessment considers the operational period up to 2042 as well as the post 2042 restoration phase. Furthermore, the findings of the ES are fully reflected in the Habitats Regulations Assessment report, which accompanied the consolidating planning submission.

2.2.5 As indicated above, Wood has an agreed DAS in place with Natural England (Ref: 2019-07-02 DAS 14395/285110) which remains extant. Should any further discussions with Natural England regards to the proposed development be required, this extant DAS will be used

as appropriate. It is envisaged this can be both pre and post consent as part of further details in terms of the discharge of conditions etc.

Provision of off-site habitat mitigation

2.2.6 As set out in the ES Chapter 11 on biodiversity and illustrated in ES Figure 11.1, as part of the proposed development, some 18 hectares of off-site habitat mitigation will be provided. This off-site habitat mitigation is to be implemented as soon as the necessary planning approvals and legal agreements are in place and will thus provide upfront mitigation for the duration of the development, until the progressive restoration, particularly of the Asham Quarry Void area, catches up. It is assumed that a commitment to providing this off-site mitigation would be provided by way of a Section 106 legal agreement and we would welcome further discussion and input from Natural England on the specification of this off-site mitigation as the detail is developed. The off-site habitat mitigation area and broad principles for habitat creation to inform the proposed development is illustrated in **Figure 2.1**. Furthermore, additional upfront planting along the perimeter of the site has been proposed, including the creation of a scrub band corridor and the transplanting of existing hedgerows, as illustrated in **Figure 8.9**.

Mendip Woodlands SAC (water environment)

2.2.7 **Table 2.1** sets out Wood's response to Natural England's comments relating to the Mendip Woodlands SAC, specifically the water environment. In summary, the response details the reasons why the SAC habitats are neither hydrologically nor geologically connected and as such, the aquatic environments within these habitats will remain in place regardless of the proposed development taking place.

Table 2.1 Natural England comments relating to Mendip Woodlands SAC (water environment)

Natural England comment	Wood response
The report to inform HRA identifies a potential risk to Mendip Woodlands SAC from dust and from changes to the water table during phases 4 and 5. The EIA report (Section 10) notes that water will be pumped from the quarry into the river and that previous dewatering at Torr Quarry has led to a localised depression in the water-table and altered local and regional flow patterns across the hydrogeological study area and the cessation of dewatering at the nearby Coleman's Complex in 2008 have resulted in the groundwater levels partially rebounding – <u>further information regarding the pumping regime is needed to understand how SAC habitats and features, which are underpinned, at least in part, by the continued functioning of the river and how the SAC will be affected in combination with other plans and projects, such as the active nearby quarries</u>. [Wood underlining] Natural England is aware that no further dewatering shall be undertaken within the nearby Bartlett's Quarry prior to the permanent cessation of commercial extraction of	In the Environmental Statement (ES) report current water environment baseline Section 10.4, Table 10.7 the Asham Wood SAC/ SSSI was identified as a potential receptor along with other water dependent conservation sites which were considered in relation to the Proposed Development during a scoping exercise. The table summarised that: *"the Somerset Environmental Records Centre mapping indicate that some of the woodland alongside the stream is wet. Input from groundwater sources is unlikely given that it overlies limestone shales. It is likely to be dependent on surface water runoff from the Shearmoor Stream catchment and the upper reaches of the Fordbury Water therefore it has been scoped out from further assessment on the basis that it is unlikely to be impacted".* The Asham Wood SAC/SSSI was thus scoped out from further assessment on the basis of the extent of wet woodland being confined to limited areas of

Natural England comment	Wood response
Carboniferous limestone and associated dewatering at Torr Works Quarry. This demonstrates the local authority's awareness of the potential cumulative effects on local communities and environment from the concurrent working.	watercourses, considered to be hydraulically upgradient of the Site. In response to the Natural England point for clarification, we have since verified this position with reference to findings of the Hanson Asham Wood Woodland Management Plan[1] (see **Appendix B** of this response) which specifically locates the parcels of wet woodland associated with the SAC. Map 4 *'Ecological and Historical Features'* of Hanson's Asham Wood Woodland Management Plan shows that there are only two small areas of wet woodland mapped as W7 (*Alnus glutinosa – Fraxinus excelsior – Lysimachia nemorum*) located in compartments 2 and 16 along the northern edge of the SAC boundary. These compartments of wet woodland are associated with a surface watercourse named the Shearmoor Stream, which flows through the fringes of Castlehill Wood and Shearmoor Wood. Table 2.2 Woodland resource characteristics in the main body of the Woodland Management Plan also confirms these findings. British Geological Society (BGS) mapping[2] indicates that wet woodland compartment 2 (approximately 370968, 146231) overlies Avon Group (Lower Limestone Shale) bedrock geology comprising of interbedded limestone and mudstone strata. The BGS mapping also indicates that compartment 16 (approximately 370586, 146438) overlies part Avon Group and the Portishead Formation of the Upper Red Sandstone Group, which comprises of interbedded mudstone and sandstone strata. Compartments 2 and 16 are situated approximately 670 m and 1 km to the north of the Site Boundary. Shearmoor Stream is a small watercourse that drains to the east, joining Fordbury Water (also known as Whatley Brook) downstream of the Site Boundary. Hydrologically, Shearmoor Stream is typical of streams draining from the central ridge that runs along the eastern Mendips hills: runoff accounts for the greater proportion of the flow although there is a component of baseflow derived from small springs emerging from the Portishead Formation. As noted in the baseline section of the ES water environment chapter (Section 10.4) the Site Boundary entirely overlies the Black Limestone Subgroup of the Pembroke Limestone Group. Furthermore, the Pembroke Limestone Group acts as a single aquifer, running from

[1] Hanson Quarry Products Europe Ltd. Asham Wood Woodland Management Plan from 2015 to 2025
[2] British Geological Survey (BGS), 2000. Frome. England and Wales Sheet 281 Solid and Drift Geology. 1:50,000. British Geological Survey, Keyworth.

Natural England comment	Wood response
	WSW to ENE and is split into separate aquifers along a southern and northern limb of a pericline split. The Avon Group or Lower Limestone Shale acts as an aquitard between the Pembroke Limestone Group and Portishead Formation of the Upper Red Sandstone Group. The lack of continuity between the Porthishead Formation and Pembroke Limestone Group Aquifers is reflected by groundwater levels that are up to 30 m to 40 m higher in the Portishead Formation. The Portishead Formation and Avon Group formations are Secondary A aquifers which are characterized by low primary porosity and permeability due to the varied lithology including well cemented mudstones, mudstones, marls and siltstones. The Pembroke Limestone Group is a Principal Aquifer characterized by dual permeability behaviour, with diffuse flow through the matric and smaller fissures and conduit flow through larger dissolution features. The conceptual hydrogeological model of the area of interest based upon the above information and data from monitoring and other studies enabled the secondary aquifers (which the wet woodland compartments 2 and 16 overlie) to be excluded from further consideration in the impact assessment based on the lack of hydraulic connectivity with the Pembroke Limestone Group aquifer. Given that there is no pathway for groundwater effects from the Site it is highly unlikely that there will be any direct or in combination cumulative impacts from the proposed development at Westdown Quarry (along other site proposals) on groundwater quantity/ quality. The baseline Section 10.4 of the ES water environment chapter identified that there was some connectivity for exchange between groundwater and surface water between the Pembroke Limestone Group and the main Fordbury Water watercourse channel. The two compartments of the wet woodland are part of the Shearnoor Stream which is headwater tributary located upstream of the main Fordbury Water channel. Wet woodland compartment 2 (137 m AOD) and 16 (146 m AOD) are between 760 m and 1.1 km upstream and raised approximately 17 – 26 m above the ground level of the confluence with the Whatley Brook/ Fordbury Water (120 m AOD). As such, there will be no hydrological connection between site proposals and the upstream wet woodland sites and no potential for impacts on the functionality of their surface water regime. As such. it can be concluded that it is highly unlikely that there will be any significant water environment impacts from Westdown Quarry (direct or cumulative) on water dependent sites associated with Asham Wood SAC. Allied to this, it is proposed to develop a detailed water

Natural England comment	Wood response
	monitoring and management plan as part of a pre-recommencement of working condition, which would allow ongoing monitoring of surrounding surface and groundwater features.
We welcome the commitment to produce a dust management plan, whilst dust may be more prevalent in the Westdown Quarry area, the impacts of dust through the restoration of Asham Wood Void should not be minimised. Natural England would also recommend the use of an effective wheel- or vehicle-washer before Fordbury Water between the main Westdown Quarry area and the Asham Wood Void area to further reduce dust impacts on the ancient Mendip Woodlands SAC.	Noted. The requirement for dust suppression measures and wheel washing facilities were identified in Section 10.8 of the water environment chapter of the ES under Pollution prevention and accident response, Environmental measures embedded into development proposals (paragraph 10.8.19). This related to each development phase to be located on-site to suppress dust as and where necessary. It was also noted that associated measures would be put forward in targeted areas for managing sediment entrained runoff. A detailed Dust management Plan (which will be prepared and agreed with the MPA prior to operations recommencing) will set out the specific mitigation measures to be implemented and reflect those already identified in Section 10.8 of the ES. English Nature's recommendation that a wheel- or vehicle-washer be located before Fordbury Water between the main Westdown Quarry area and the Asham Wood Void area is welcomed and we would seek to incorporate this into the Dust Management Plan.

Other species and habitats of importance

Open mosaic habitat on previously developed land (OMHPDL)

2.2.8 In their response Natural England indicated that *"In particular habitat and botanical surveys have demonstrated that the mix of naturally colonising vegetation including trees, shrubs, grasses, and other flora within the application site is diverse and fully meet the criteria for open mosaic on previously developed land, which is national PH. This habitat will be permanently lost, and further information is needed to show how this will be compensated. This is a separate issue to the mitigation measures required to protect the integrity of national and European sites."*

2.2.9 Given that a large part of the site is an abandoned historic quarry, which has been left to naturally regenerate over the past 30+ years, it is unsurprising that priority habitat of open mosaic habitat on previously developed land (OMHPDL) is found within the Site. Section 11.19 of ES Chapter 11 (Biodiversity) details the effect that the recommencement of quarrying at the Site would have on this priority habitat. In summarising the effects on this habitat type, paragraph 11.1.9.8 states:

"Although small areas of this habitat will be created during the operation of the quarry, and on retained habitats (such as the quarry benches), this is not quantifiable and an adverse effect on the priority habitat is therefore predicted in the short, medium and long term (beyond (20 years) and hence is considered to be a significant negative effect."

2.2.10 Notwithstanding the identified loss of the OMHPDL, it is considered that this loss is being compensated for, in the long-term, through the proposed progressive restoration and aftercare of the entire site encompassing both Westdown Quarry as well as the Asham Wood Void area, as set out in Section 3.3 of ES Chapter 3 and in Section 3.10 of the Planning Statement and illustrated in ES Figure 3.8, which is replicated in Figure 3.6 of the Planning Statement. The proposed progressive restoration would occur across the application site with opportunities concentrated within specific areas including the progressive restoration of benches, quarry backfill tips and lake margins as the quarry is expanded and deepened. Specifically, with regards to Westdown Quarry, benches would be restored to a combination of calcareous grassland (also a priority habitat) with scrub and tree planting to soften the faces and increase the mosaic of habitats and connectivity. In particular, it is considered that what is being offered by way of restoration, would result in **substantial** medium- and long-term biodiversity gains for the area – as well as significant planning gains through making the site safer, more stable and as a consequence, one which presents greater opportunities for public access and enjoyment.

2.2.11 In addition to this, it is worth noting that although a long-term loss of OMHPDL has been identified, the creation of such habitat is part of the successional habitat creation of hard rock quarries. In other words, it is habitat that will be created progressively and by default, as the site is restored, and. whilst calcareous grassland and woodland is developing.

2.2.12 Large swathes of the Asham Wood Void floor, notably those areas located within the floodplain, are to be retained as it is (i.e. OMHPDL). Furthermore, additional areas of OMHPDL will be created as interim restoration across a wider area of the Site prior to final rebound of lake water levels on completion. Further details are set out in Chapter 8 of this response and illustrated in **Figures 8.1** to **8.8**.

2.2.13 As part of the proposed restoration scheme, a detailed landscaping and planting mitigation strategy and an ecological management plan will be agreed in writing with the MPA prior to the recommencement of workings, as detailed in the proposed schedule of conditions set out in Appendix B of the Planning Statement.

2.2.14 Finally, although it has been concluded that there will be significant effects on the open mosaic habitat on site as a result of the proposed recommencement of quarrying operations, it is not considered that this makes the proposed development unacceptable. Indeed, the planning submissions are essentially **reviews of old mineral permissions** (SCC/3836/2021/IDO, SCC/3837/2021/IDO, and SCC/3838/2021/ROMP), where the acceptability of extraction at Westdown Quarry is already established (along with the consequential loss of the recently created open mosaic habitat). The planning application(s) and supporting ES have sought to demonstrate how this loss can most appropriately be mitigated. In the case of the current proposals, we are seeking to replace the open mosaic habitat with other types of valuable habitat, which not only offer significant ecological benefit, but also seek to allow the site to 'dovetail' with its surrounding landscape in a seamless and consistent manner.

Defra biodiversity metric

2.2.15 Natural England also states in their response that: *"As the emphasis for priority habitats is on the conservation, restoration and enhancement (NPPF para 174) regardless of their*

current state, Natural England would advise the use of the Defra Biodiversity Metric and if required, further compensation against the loss of any of the onsite priority habitats, either by a replacement habitat or financial contribution towards a replacement habitat."

2.2.16 A scoping opinion provided by Somerset County Council (SCC) in advance of the preparation of the submissions, requested that their Habitats Evaluation Procedure (HEP) be used to inform the review of old mineral permission submissions.

2.2.17 The HEP is a method for calculating the value of a given site for a variety of protected species in Somerset. It also determines the amount of habitat that is required to mitigate for habitat loss and/or land use change for development proposals on the given site. The methodology is provided in two documents published by SCC[3]:

- Somerset Habitat Evaluation Procedure Methodology (September 2016); and
- Hestercomb House Special Area of Conservation (SAC) Guidance on Development (Version 2.2, 2019)[4].

2.2.18 At the time when SCC validated the Westdown planning applications (May 2021) and when responding to Natural England's comments (June 2021), the applicant argued there was no statutory requirement to use the Defra biodiversity metric to calculate biodiversity net gain provisions in that the Environment Bill 2021 had not yet received royal assent, which was only granted in November 2021. In Somerset however, there is a requirement to consider such habitat compensation measure via their own HEP – this requirement forms part of the County Council's planning application validation checklist and is also provided for within extant planning policy (Policy DM2 Biodiversity and Geodiversity of the Somerset Minerals Local Plan (adopted 2015). Following the advice of SCC in their scoping opinion dated July 2020, and to ensure compliance with the extant development plan, Hanson opted to inform the off-setting of any loss of biodiversity via the HEP process rather than via the application of the Defra metric. Please refer to Section 2.4 for further details.

2.2.19 Allied to this, whilst the Environment Bill has now received royal ascent, none of the relevant sections of the Act are currently in force, as the necessary regulations setting out how BNG (and the Defra metric) should be implemented have yet to be established. Furthermore, it should be noted that the Act provides that all planning permission granted under the Town and Country Planning Act 1990 (and the Planning Act 2008 for nationally significant infrastructure projects) will be subject to a condition for biodiversity net gain that must be met before the development commences – see Part 6, paragraph 98 and Schedule 14 of the 2021 Act. However, the vast majority of the Westdown proposals are being sought under the Environment Act 1995 (as ROMP and IDOs).

[3] SCC were contacted for clarification on approach and recommended the listed documents form the basis of the HEP for the Westdown Quarry project.

[4] Note the Westdown Quarry project is not related to the Hestercomb House SAC, rather the approach used is relevant and can be applied to the project.

Lesser horseshoe bats

Mitigation of habitats loss and disturbance

2.2.20 In their response Natural England indicated that *"Further information is needed to show how the impacts of habitat loss and disturbance will be mitigated throughout the proposed mineral working and restoration period, which extend over 25 years so would affect many generations of bats. For example, it is stated within the EIA (11.21.21.) that it will be 10 years from commencement of operations before works encroach up to ~50m from the roost site at Westdown Farm. The increasing noise and vibration are considered unlikely to disturb bats roosting at Westdown Farm before this time. However, phased plans show close proximity of quarry to Westdown Farm by end of year 5, suggesting noise and vibration disturbance will occur significantly earlier than suggested"*.

2.2.21 The phasing plans for the proposed development are illustrated in ES Figures 3.3 to 3.7 (which are replicated as Figures 3.1 to 3.5 in the Planning Statement). ES Chapter 3 sets out a detailed description for each phase of the proposed development. This information is replicated in Section 3 of the Planning Statement. A detailed description for Phase 2 (up to the end of year 5) is set out in ES paragraphs 3.2.16 to 3.2.20 and illustrated in ES Figure 3.4 (and replicated in paragraphs 3.2.14 to 3.2.18 and Figure 3.2 of the Planning Statement). It is acknowledged that at the end of Phase 2 (i.e. year 5 of the proposed development), the proposed development is shown to encroach up to ~50 m from the Westdown Farm roost site. Thus, the reference in ES paragraph 11.21.21 that it will be 10 years from commencement of operations before works encroach up to ~50 m from the roost site at Westdown Farm is an error, albeit a distinction needs to be made between preparatory works such as soil stripping and operational works including extraction. This should be 5 years.

2.2.22 ES Chapter 11 (Biodiversity) and Section 4.7 of the Planning Statement set out the findings of the ecological assessment which has been undertaken as part of the EIA in support of the Westdown Quarry applications. ES Chapter 11 is supported by seven appendices including Appendix 11A which provides the ecological baseline report for the application site and Appendix 11B which sets out the baseline specifically for bats. Section 11.4 of ES Chapter 11 sets out the data gathering methodology used including the extensive survey work undertaken. With reference to bats, ES Appendix 11B Bat Baseline Report (see paragraphs 3.1.6 to 3.1.8) details the scope of all of bat surveys carried out at the application site and which have informed the ES. As stated, the scope of these surveys was agreed with Natural England via their Discretionary Advice Service (DAS) on three occasions. The documented consultation of these DAS consultations is presented in Appendix D of ES Appendix 11B. Furthermore, the comments made by Natural England in response to the request for a formal scoping opinion by Hanson to SCC in May 2020 were considered as detailed in both the Planning Statement and ES Chapter 11.

2.2.23 Section 11.8 of ES Chapter 11 details those environmental measures embedded into the development proposals in order to avoid or reduce potential adverse effects on biodiversity, to prevent breaches of legislation, or compensate for adverse effects and/or deliver environmental enhancement. These are set out in ES Tables 11.9 and 11.10 and include a mixture of both on-site and off-site mitigation measures. On-site mitigation measures include the progressive phased restoration of the application site as well as the

Asham Quarry Void area (which will not be worked), creating replacement habitats for the benefit of bats at the same time that habitats are lost from other areas of the application site. Details of the progressive restoration are illustrated on the phasing plans for the proposed development (ES Figures 3.3 to 3.7 which are replicated in the Planning Statement, Figures 3.1 to 3.5) as well as on the proposed restoration plan as illustrated on ES Figure 3.8, which is replicated in Planning Statement Figure 3.6. A detailed description of the proposed restoration and aftercare of the application site is set out in Section 3.3 of ES Chapter 3 and in Section 3.10 of the Planning Statement. Additional information on the proposed progressive phased restoration of the Site is detailed in Chapter 8 and **Figures 8.1** to **8.8** of this response, including additional upfront planting along the perimeter of the site (**Figure 8.9**). Off-site mitigation measures are addressed below.

2.2.24 Notwithstanding this, as explained below, in conjunction with the on-site mitigation measures referred to above, both off-site mitigation and a compensatory roost structure will be provided as part of the proposed development in Year 1 and some 15 years prior to the anticipated demolition of the farmhouse (see **Figure 2.1**). Any work relating to the provision of both on- and off-site mitigation measures will require an approved European Protected Species Licence.

2.2.25 As set out in both ES Chapter 11 (Section 11.8, notably Table 11.10, and paragraph 11.21.21) and the Planning Statement (Section 4.7, specifically paragraph 4.7.7), off-site mitigation as well as a compensatory roost structure will be provided as part of the proposed development in Year 1 as illustrated in **Figure 2.1** (which provides additional information to ES Figure 11.1) in recognition that the application site is an important resource for lesser horseshoe bats as demonstrated by the high numbers recorded across the site and that they are connected with three maternity roosts, one of which falls within the application site at Westdown Farm and the others close by. Provision of the off-site mitigation and compensatory roost structure in Year 1 will allow for the establishment of these replacements habitats and enable the transition to the compensatory roost structure as early as possible within the lifespan of the proposed development. Additional roosting will be provided by way of concrete tunnel(s) to be buried in tipped material in Asham Quarry Void in Phase 1 of the operational phase of the proposed development. Furthermore, hedgerows would be retained for as long as possible and/or transplanted to compliment the additional upfront planting along the site perimeter as illustrated in **Figure 8.9**.

Compensatory roost structure

2.2.26 In their response Natural England state *"Considering the level of importance of the large on-site lesser horseshoe maternity roost, further detail on the compensatory roost structures would be appreciated"*. As illustrated on ES Figure 11.1 'Offsite mitigation', the compensatory roost structure (referred to as the 'proposed bat house' on ES Figure 11.1) is to be provided on within the 18 ha area identified for off-site habitat mitigation on land within Hanson's ownership which lies immediately to the north of Westdown Quarry and to the south of the Bulls Green Link Road (see also **Figure 2.1**). As detailed in ES Table 11.10, the loss of the roost site at Westdown Farm (at approximately 15 years after the commencement of operations) will be mitigated and compensated for by the provision of identical or near-identical roosting opportunities to be created in

Phase 1/Year1 of the operation phase. Additional roosting opportunities will be provided by way of concrete tunnel(s) to be buried in tipped materials in Asham Quarry Void in Phase 1 of the operation phase. Hanson will seek to work with Natural England, through the extant DAS as appropriate, as well as the local bat group to secure an appropriate design for the compensatory roost structure and habitat.

2.2.27 As stated above, the compensatory roost structure (in conjunction with other upfront off-site mitigation) will be provided at the outset, i.e. in Year 1, of the proposed development, the indicative details of which are provided below.

2.2.28 The compensatory roost structure ('bat house') will be based on the design presented in the Lesser Horseshoe Bat Conservation Handbook[5] with modifications to include features for other bat species. The bat house will incorporate a loft space with 'hot box', a ground floor room suitable for light sampling, and a cool room suitable for hibernation. The building plan will be L-shaped with a minimum volume of 250 m^3. The ground floor will have a celling throughout with access to roof voids though loft hatches and will provide suitable access to the loft for lesser horseshoe bats. High humidity within the ground floor area will be achieved by creating an additional access point situated on the eastern aspect at ground level, with drainpipe leading from the roof into the house. Water from rain fall will flow into the house creating high humidity. A high security steel door with an opening (50 cm x 50 cm) with horizonal bars (15 cm apart) will be present to enable lesser horseshoe bats to access the ground floor and a second access with an opening (50 cm x 50 cm) with horizonal bars (15 cm apart) suitable for lesser horseshoe will be present with a mammal prevention panel below will be positioned at a different location. The door will also provide access for humans, in addition an access hatch will also provide human access for inspection. Rough surfaces such as exposed timbers and bitumastic felt will be present throughout the bat house at varying heights to provide perching opportunities, allowing bats to hang from. Where required baffles will be present to reduce light spillage.

2.2.29 The roof will consist of concrete roof tiles or slate and will contain ventilated ridge tiles to allow bat to access and tiles in the roof to allow bat to access providing roosting opportunities for a variety of crevice dwelling species. The roof timbers will be a cut and pitch construction with joists and rafters providing an uncluttered space for bats to fly. A loose fitting bitumastic felt will be used with tears to allow bat access into the loft for a variety of bat species. Access points for crevice-roosting species will be provided on all aspects. The structure will consist of brick internal leaf, and brick internal walls.

Soil and land quality

2.2.30 On page 4 of their response, Natural England make reference to the fact that the proposed development comprises approximately 37.6 ha of agricultural land, including 21.6 ha classified as 'best and most versatile'. i.e. Grades 1, 2 and 3a in the Agricultural Land Classification (ALC). They recognise that a proportion of the agricultural land affected by the development will remain undeveloped for habitat creation and that *"in order to retain the long term potential of this land and to safeguard soil resources as part of the overall sustainability of the whole development, it is important that the soil is able to retain as many of its many important functions and services (ecosystem services) as possible*

[5] Schofield, H. W. (2008) The Lesser Horseshoe Bat. Conservation Handbook. The Vincent Wildlife Trust, Ledbury.

through careful soil management". Natural England thus advise *"that if the development proceeds, the developer uses an appropriately experienced soil specialist to advise on, and supervise, soil handling, including identifying when soils are dry enough to be handled and how to make the best use of the different soils on site. It is anticipated that all of the embedded measures will be secured through development of a Soil Management Plan, which will form a condition of the Proposed Development*".

2.2.31 Mitigations measures relating to agricultural land and soils are detailed in ES Chapter 15 (see Table 15.5 and Section 15.8) as well as the Planning Statement (Section 4.9, specifically paragraph 4.9.4) and includes for the preparation of a Soils Handling and Management Plan[6] to be agreed writing with the LPA prior to the recommencement of mineral workings at Westdown Quarry. This plan will set out the measures to ensure that soils are carefully managed and stored as part of the proposed development. Furthermore, the requirement to prepare and agree such a Plan prior to the recommencement of mineral workings, is detailed in the proposed Schedule of Conditions which is appended to the Planning Statement (Appendix B). Importantly, all soils across the Site will be used in a beneficial and responsible manner, such that the wider site can be restored to a high standard.

2.2.32 As previously reiterated, planning consent for the extraction of minerals already exists at Westdown Quarry. The x4 applications being considered by Somerset County Council as the relevant Minerals Planning Authority – SCC/3795/2021, SCC/3836/2021/IDO, SCC/3837/2021/IDO, and SCC/3838/2021/ROMP – are to determine how to make the proposed development acceptable by way of an updated schedule of planning conditions.

Landscape

2.2.33 On page 5 of their response, Natural England indicate that although the proposal does not appear to be either located within, or within the setting of, any nationally designated landscape, all proposals should complement and where possible enhance local distinctiveness and be guided by Mendip District Council's landscape character assessment where available, and the policies protecting landscape character in the relevant local plan or development framework.

2.2.34 We agree with Natural England that the proposed development should complement and where possible enhance local distinctiveness. As such, a comprehensive Landscape and Visual Impact Assessment (LVIA) of the proposed development has been undertaken, the scope and results of which are detailed in the ES landscape and visual chapter (ES Chapter 6) as well as the Planning Statement (Section 4.2). The LVIA has given full cognisance of Mendip District Council's landscape character assessment[7] as well as the relevant local plan policies protecting landscape character (see Tables 6.1 and 6.2 of ES Chapter 6 as well as Tables 5.1 and 5.3 of the Planning Statement).

[6] Soils Handling and Management Plan to be prepared by a soil specialist in line with the requirements of the updated 2021 'Good Practice Guide for Handling Soils' (Dr RN Humphries).
[7] Macgregor Smith Landscape Architects. (2020). Mendip Landscape Character Assessment [online]. Available at: https://www.mendip.gov.uk/evidencebaselandscape

2.3 Rebuttal to SES

2.3.1 **Table 2.2** provides a detailed response to the issues and clarifications set out by SES in their October 2021 response.

Table 2.2 Applicant's rebuttals to issues and clarifications raised by Somerset Ecological Services (SES) in October 2021

Topic	Summary of SES response	Applicant's rebuttal
Overall Assessment		
	Concerns with the assessment of short-, medium and long-term impacts to designated sites, protected and priority habitats and species across the site. It is considered that the adequacy of proposed mitigation relies far too heavily on the long-term completed scheme and significantly underplays potentially major adverse effects during the intervening years, which is likely to be 30+ years.	This initial point sets out Somerset Council's position on the assessment currently. Whilst it is noted, we strongly dispute this and responses to SES's points supporting their conclusion follow.
	Potential risk to Mendip Woodlands SAC from changes to the water table. Request for further information relating to water table change and pumping regime is needed to understand how the SAC habitats and features, and other designated sites, which are underpinned, at least in part by the continued functioning of the river will be affected.	Clarification on the issue of SAC habitats was provided in a response (Reference: 40380-WOOD-XX-XX-CO-J-0020_S2_P01) to SCC on 23rd July 2021 in reference to comments received from Natural England on the same subject. In summary, the response details the reasons why the SAC habitats are neither hydrologically nor geologically connected and as such, the aquatic environments within these habitats will remain in place regardless of the proposed development taking place. However the detailed response is repeated below for clarity. *In the Environmental Statement (ES) report current water environment baseline Section 10.4, Table 10.7 the Asham Wood SAC/SSSI was identified as a potential receptor along with other water dependent conservation sites which were considered in relation to the Proposed Development during a scoping exercise. The table summarised that:* *"The Somerset Environmental Records Centre mapping indicate that some of the woodland alongside the stream is wet. Input from groundwater sources is unlikely given that it overlies limestone shales. It is likely to be dependent on surface water runoff from the Shearmoor Stream catchment and the upper reaches of the Fordbury Water therefore it has been scoped out from further assessment on the basis that it is unlikely to be impacted".*

Topic	Summary of SES response	Applicant's rebuttal
		The Asham Wood SAC/SSSI was thus scoped out from further assessment on the basis of the extent of wet woodland being confined to limited areas of watercourses, considered to be hydraulically upgradient of the Site. *In response to the Natural England point for clarification, we have since verified this position with reference to findings of the Hanson Asham Wood Woodland Management Plan[8] (see **Appendix B** of this response) which specifically locates the parcels of wet woodland associated with the SAC. Map 4 'Ecological and Historical Features' of Hanson's Asham Wood Woodland Management Plan shows that there are only two small areas of wet woodland mapped as W7 (Alnus glutinosa – Fraxinus excelsior – Lysimachia nemorum) located in compartments 2 and 16 along the northern edge of the SAC boundary.* *These compartments of wet woodland are associated with a surface watercourse named the Shearmoor Stream, which flows through the fringes of Castlehill Wood and Shearmoor Wood. Table 2.2 Woodland resource characteristics in the main body of the Woodland Management Plan also confirms these findings.* *British Geological Society (BGS) mapping[9] indicates that wet woodland compartment 2 (approximately 370968, 146231) overlies Avon Group (Lower Limestone Shale) bedrock geology comprising of interbedded limestone and mudstone strata.* *The BGS mapping also indicates that compartment 16 (approximately 370586, 146438) overlies part Avon Group and the Portishead Formation of the Upper Red Sandstone Group, which comprises of interbedded mudstone and sandstone strata. Compartments 2 and 16*

[8] Hanson Quarry Products Europe Ltd. Asham Wood Woodland Management Plan from 2015 to 2025
[9] British Geological Survey (BGS), 2000. Frome. England and Wales Sheet 281 Solid and Drift Geology. 1:50,000. British Geological Survey, Keyworth.

Topic	Summary of SES response	Applicant's rebuttal
		are situated approximately 670 m and 1 km to the north of the Site Boundary. *Shearmoor Stream is a small watercourse that drains to the east, joining Fordbury Water (also known as Whatley Brook) downstream of the Site Boundary. Hydrologically, Shearmoor Stream is typical of streams draining from the central ridge that runs along the eastern Mendips hills: runoff accounts for the greater proportion of the flow although there is a component of baseflow derived from small springs emerging from the Portishead Formation.* *As noted in the baseline section of the ES water environment chapter (Section 10.4) the Site Boundary entirely overlies the Black Limestone Subgroup of the Pembroke Limestone Group. Furthermore, the Pembroke Limestone Group acts as a single aquifer, running from WSW to ENE and is split into separate aquifers along a southern and northern limb of a pericline split.* *The Avon Group or Lower Limestone Shale acts as an aquitard between the Pembroke Limestone Group and Portishead Formation of the Upper Red Sandstone Group. The lack of continuity between the Porthishead Formation and Pembroke Limestone Group Aquifers is reflected by groundwater levels that are up to 30 m to 40 m higher in the Portishead Formation. The Portishead Formation and Avon Group formations are Secondary A aquifers which are characterized by low primary porosity and permeability due to the varied lithology including well cemented mudstones, mudstones, marls and siltstones.* *The Pembroke Limestone Group is a Principal Aquifer characterized by dual permeability behaviour, with diffuse flow through the matric and smaller fissures and conduit flow through larger dissolution features.* *The conceptual hydrogeological model of the area of interest based upon the above information and data from monitoring and other*

Topic	Summary of SES response	Applicant's rebuttal
		studies enabled the secondary aquifers (which the wet woodland compartments 2 and 16 overlie) to be excluded from further consideration in the impact assessment based on the lack of hydraulic connectivity with the Pembroke Limestone Group aquifer. Given that there is no pathway for groundwater effects from the Site it is highly unlikely that there will be any direct or in combination cumulative impacts from the proposed development at Westdown Quarry (along other site proposals) on groundwater quantity/ quality. *The baseline Section 10.4 of the ES water environment chapter identified that there was some connectivity for exchange between groundwater and surface water between the Pembroke Limestone Group and the main Fordbury Water watercourse channel. The two compartments of the wet woodland are part of the Shearnoor Stream which is headwater tributary located upstream of the main Fordbury Water channel. Wet woodland compartment 2 (137 m AOD) and 16 (146 m AOD) are between 760 m and 1.1 km upstream and raised approximately 17 – 26 m above the ground level of the confluence with the Whatley Brook/ Fordbury Water (120 m AOD). As such, there will be no hydrological connection between site proposals and the upstream wet woodland sites and no potential for impacts on the functionality of their surface water regime.* *As such. it can be concluded that it is highly unlikely that there will be any significant water environment impacts from Westdown Quarry (direct or cumulative) on water dependent sites associated with Asham Wood SAC. Allied to this, it is proposed to develop a detailed water monitoring and management plan as part of a pre-recommencement of working condition, which would allow ongoing monitoring of surrounding surface and groundwater features.* In addition to the above, the Water Environment Chapter of the ES (ES Chapter 10) presents assessments of the hydrological effects on a number of hydrological receptors (watercourses, waterbodies etc). We

Topic	Summary of SES response	Applicant's rebuttal
		do not believe that the information above alters any of those assessments. No further information is therefore required. Furthermore, the importance of the Fordbury Water corridor for wildlife is recognised by Hanson and fully reflected in the design of the proposed scheme which seeks to stand off from this valuable feature. In addition, the integrity of the Fordbury water corridor is secured for the duration of Westdown, by the fact that dewatering is going to be continuously pumped from the base of the quarry and the surface flows and streamside wetland features will therefore be guaranteed for as long as that goes on.
	Justification for 5km search of statutory designated sites is absent from Appendix 11A despite the Biodiversity chapter referring to 11A for a justification.	Noted. The extent of the desk study areas and field survey areas were determined based on best practice guidance, a high-level overview of the types of ecological features present, and the potential effects that could occur. The study area was defined on a precautionary basis to ensure that, as a minimum, the Zone of Influence (ZoI) relevant to all ecological features were covered during baseline data collection activities.
Habitats		
Priority Habitat open mosaic on previously developed land	This habitat would be permanently lost as a result of the proposed scheme, and further quantifiable information is needed to show how this will be compensated.	Open mosaic habitat on previously developed land (OMHPDL) only exists at Westdown due to previous quarrying activity. The quarrying industry is renowned for the beneficial interim habitats created as 'temporary nature' in fallow periods prior to works resuming but should not be penalised when resumption of quarrying activity subsequently impacts this habitat. It is acknowledged that this habitat will unfortunately be lost in the short-term but progressive restoration will facilitate the continual provision of such early successional habitats. Hanson are uncomfortable that this positive contribution is being highlighted as a constraint which questions the basis of the approach adopted. It is further noted that this habitat is characterised by successional habitats, that in many areas within the boundary are approaching or have moved into secondary habitats. Without any

Topic	Summary of SES response	Applicant's rebuttal
		further intervention this habitat will be naturally lost within the relative short term. Conversely new quarrying activity will create this type of habitat as the active works progress. Clarification on this issue was provided in a response (Reference: 40380-WOOD-XX-XX-CO-J-0020_S2_P01) to SCC on 23rd July 2021 in reference to comments received from Natural England on the same subject. The detailed response is repeated below for clarity (see also paragraphs 2.28 to 2.2.13 of this response). However it is important to reiterate that open mosaic habitat is a **temporary/transient** habitat, only present as a result of quarrying having taken place and that if left without the proposed development taking place would naturally transition to other types of habitats, not all of which would be priority habitat. Whilst recognising there will be a loss of open mosaic habitat due to the proposed development, temporary habitat will continuously be created throughout the working and progressive restoration of the proposed reopening of the quarry. Furthermore, the proposed Schedule of Conditions (as set out in Appendix B of the Planning Statement) includes for the provision of a Habitat Management Plan. *Given that a large part of the site is an abandoned historic quarry, which has been left to naturally regenerate over the past 30+ years, it is unsurprising that priority habitat of open mosaic habitat on previously developed land (OMHPDL) is found within the site. Section 11.19 of ES (Biodiversity) details the effect that the recommencement of quarrying at the site would have on this priority habitat. In summarising the effects on this habitat type, paragraph 11.1.9.8 states:* *"Although small areas of this habitat will be created during the operation of the quarry, and on retained habitats (such as the quarry benches), this is not quantifiable and an adverse effect on the priority habitat is therefore predicted in the short, medium and long term (beyond (20 years) and hence is considered to be a significant negative effect."*

Topic	Summary of SES response	Applicant's rebuttal
		Notwithstanding the identified loss of the OMHPDL, it is considered that this loss is being compensated for, in the long-term, through the proposed progressive restoration and aftercare of the entire site encompassing both Westdown Quarry as well as the Asham Wood Void area, as set out in Section 3.3 of ES Chapter 3 and in Section 3.10 of the Planning Statement and illustrated in ES Figure 3.8, which is replicated in Planning Statement on Figure 3.6. The proposed progressive restoration would occur across the application site with opportunities concentrated within specific areas including the progressive restoration of benches, quarry backfill tips and lake margins as the quarry is expanded and deepened. Specifically, with regards to Westdown Quarry, benches would be restored to a combination of calcareous grassland (also a priority habitat) with scrub and tree planting to soften the faces and increase the mosaic of habitats and connectivity. In particular, it is considered that what is being offered by way of restoration, would result in ***substantial*** *medium- and long-term biodiversity gains for the area – as well as significant planning gains through making the site safer, more stable and as a consequence, one which presents greater opportunities for public access and enjoyment.* *In addition to this, it is worth noting that although a long-term loss of OMHPDL has been identified, the creation of such habitat is part of the successional habitat creation of hard rock quarries. In other words, it is habitat that will be created progressively and by default, as the site is restored, and whilst calcareous grassland and woodland is developing.* *Large swathes of the Asham Wood Void floor, notably those areas located within the floodplain, are to be retained as it is (i.e. OMHPDL). Furthermore, additional areas of OMHPDL will be created as interim restoration across a wider area of the site prior to final rebound of lake water levels on completion. Further details are set out in Chapter 8 of this response and illustrated in* ***Figures 8.1*** *to* ***8.8****.*

Topic	Summary of SES response	Applicant's rebuttal
		As part of the proposed restoration scheme, a detailed landscaping and planting mitigation strategy and an ecological management plan will be agreed in writing with the MPA prior to the recommencement of workings, as detailed in the proposed schedule of conditions set out in Appendix B of the Planning Statement. *Finally, although it has been concluded that there will be significant effects on the open mosaic habitat on site as a result of the proposed recommencement of quarrying operations, it is not considered that this makes the proposed development unacceptable. Indeed, the planning submissions are essentially* ***reviews of old mineral permissions*** *(SCC/3836/2021/IDO, SCC/3837/2021/IDO, and SCC/3838/2021/ROMP), where the acceptability of extraction at Westdown Quarry is already established (along with the consequential loss of the recently created open mosaic habitat). The planning application(s) and supporting ES have sought to demonstrate how this loss can most appropriately be mitigated. In the case of the current proposals, we are seeking to replace the open mosaic habitat with other types of valuable habitat, which not only offer significant ecological benefit, but also seek to allow the site to 'dovetail' with its surrounding landscape in a seamless and consistent manner.*
Biodiversity net gain	It is recommended DEFRA's Biodiversity Metric (currently version 3.0) is used to demonstrate how mitigation proposals will account for loss of habitats (particularly the wealth of Priority Habitats that are present) and result in a net gain for biodiversity.	The applicant has used the Habitat Evaluation Procedure (HEP) method as opposed to DEFRA's Biodiversity Metric in accordance with the Somerset Minerals Local Plan (2015), notably paragraph 14.9 and Policy DM2. Furthermore, the use of the HEP method was set out in the Council's Scoping Opinion/pre-application advice (2020) (ref. SCC/3703/2020/PA).
Broadleaved woodland	Value of the naturally colonising habitat is underplayed. Prominence of Ash Dieback – the effects of clearing these naturally colonising habitats (secondary woodland in Asham Wood SSSI and Mendip Woodlands SAC) with respect to Ash Dieback to accommodate reopening of Westdown Quarry are not considered.	We do not consider it appropriate to consider the predicted habitat losses and proposed mitigation in the context of the compounding effect of a natural phenomenon such as Ash Dieback. A similar scenario would be including the effects of avian flu on bird populations as part of the ornithological assessment, which we would suggest is equally not appropriate. Hanson are actively liaising with

Topic	Summary of SES response	Applicant's rebuttal
		Natural England and the Forestry Commission to manage Asham Wood SAC and the areas of secondary woodland in the face of Ash Dieback, including seeking to update their woodland management plan. The updated woodland management plan will reflect a new strategy to retain ash that show resilience to the disease and to guard natural regeneration of other species within the coppice blocks, e.g. field maple, oak, birch, and also look into collecting and growing on-site small leaved lime and oak for planting. It is not known how Ash Dieback will affect the woodland and as such, all relevant parties are working together to plot a course to the best of their knowledge and experience. Positive management of Asham Wood will be undertaken independently of the proposed quarrying activity at Westdown. It is inferred from the commentary that SES consider that the loss of ash trees from within Asham Woods SSSI is somewhat ameliorated by the presence of pioneering birch woodland within areas of previous quarrying. However, the descriptions of the designated features do not include birch dominated stands which are considered to be very different in nature than the secondary ash woodland in Asham Wood.
Integrity of surrounding ecological networks	There is concern that the proposed scheme will impact the integrity of surrounding ecological networks and the proposals do not set out mitigation plans that outline how this will be accounted for.	The applicant refers SES to the design of the quarry activity, noting in particular the avoidance (except at a current bridge crossing) and maintenance of Fordbury Water and associated woodland and the majority of other existing woodland within the boundary. Alongside this, the phased habitat loss, phased quarrying activity and progressive restoration will ensure that corridors of movement for a variety of species to move across the landscape will always be available. Notably, the proposed perimeter bank planting (including transplanting of internal hedgerows that would otherwise be lost) will all be in place before the internal hedge network is lost as well as the provision of upfront mitigation planting by means of the off-site habitat creation which is planned for Year 1 of the proposed development (see **Figures 2.1** and **8.9** of this response). This will reinforce and enhance the connectivity currently provided by the hedgerow network. Once quarrying activity is complete, the restored

Topic	Summary of SES response	Applicant's rebuttal
		area will provide a large area of suitable habitat for a wide variety of species, including those already known to be present in the general area.
Natural Capital	Natural capital and ecosystem services are not however acknowledged within the ES.	Developers are not required to provide a Natural Capital assessment; furthermore, no reference to the provision of a Natural Capital assessment was made in SCC's Scoping Opinion/pre-application advice (2020) (ref. SCC/3703/2020/PA). Although DEFRA publish guidance on Natural Capital assessment, there is no widely used method for calculating at this juncture. It is recognised that there are a number of Natural Capital tools available, although the majority of these are either in a test phase or have been superseded. It should be noted that the elements that may be under consideration within a Natural Capital assessment (e.g. flood risk, water quality, air quality, habitat, carbon etc.) are considered within the ES.
Climate change	No specific Climate chapter within the ES.	Whilst no specific climate chapter has been included in the ES, climate is an integrated consideration in the other chapters of the ES, most notably the water environment (ES Chapter 10). In addition, climate is addressed in the Planning Statement (see Section 5.5 and Table 5.3).
Species		
Protected Species	The Biodiversity Chapter does not include sufficient consideration or impact assessment to several Priority Species under Section 41 of the NERC Act 2006, namely hedgehog, brown hare, common toad, and polecat. These species are likely to be present across the application site and wider landscape and could endure significant adverse effects as a result of the reopening of the quarry and associated habitat loss.	A desk-study was undertaken to identify legally protected and notable species within 2km of the site. This returned 1 record of hedgehog, 4 records of brown hare, 1 record of common toad, and 0 records of polecat. During the large number of survey visits to the site, there were no observations of any of these species, including during specific surveys when this may have been expected (e.g. common toad not recorded during great crested newt surveys). Although it is not possible to conclude that these species are not present on the site, the weight of evidence is suggestive of either low density populations or absence. The habitat retention on site, the phased land use and the progressive restoration, as well as the provision of off-site mitigation (ES Figure 11.1 as well as **Figure 2.1** of

Topic	Summary of SES response	Applicant's rebuttal
		this response), provide adequate opportunities for these species to remain within the planning boundary throughout the quarrying activity and expand into the restored areas as these become available. It should also be recognised that a method of working to ensure compliance with wildlife legislation will be in place to avoid direct death or injury of a variety of species. It is also noted that the EcIA process (CIEEM, 2019) is designed to be proportionate. The ES is considered to identify the ecological features that are considered to be at risk of a likely significant effect occurring. Desk study results, consultation and engagement coupled with the professional judgement of Wood's qualified ecologists were used to determine what surveys were required to deliver proportionate assessment.
Goshawk	Lateness of surveying efforts may have limited observations of goshawk, a Schedule 1 bird under Wildlife & Countryside Act 1981 (as amended). Suitable woodland habitat exists for goshawk within and surrounding the application site.	Goshawk remains a rare breeding resident within Somerset (Somerset Ornithological Society 2021[10] with confirmed breeding limited to a small number of sites. Goshawk was also not identified as part of the desk study results. Whilst the site supports some habitat suitable for this species it is anticipated that only immature woodland that would be unsuitable for Goshawk as a breeding species would be lost to the development and areas of more mature woodland (with greater potential for this species) would be retained. Walkover surveys of the site were completed during January and February to complete wintering bird surveys and no large nest platforms were identified that had potential to support Goshawk. These would have been more obvious to surveyors during winter months when trees were not in leaf. Whilst it is acknowledged that the start of the survey programme did not capture the potential period for Goshawk courtship, the survey

[10] Somerset Ornithological Society (2021). Somerset Bird Report 2017.

Topic	Summary of SES response	Applicant's rebuttal
		programme did include visits from late February and April – June such that observations of Goshawk, if present, would have been expected to be recorded by staff present on site. It is considered that this species was not present within the site at the time of survey. Given the transient nature of ecology, should additional species be encountered at the time of development, then the planning conditions, habitat management plan (HMP) and Ecological Management plans will cover this as well as any licences where appropriate.
Barn Owl	The breeding bird surveys do not account for potential impacts to barn owl. Mature trees along woodland edges, barns, and disused buildings across and adjacent to the application site could be used by breeding barn owls. Barn owl is a Schedule 1 bird under the Wildlife & Countryside Act 1981 (as amended). Furthermore, considering the amount of woodland present within the application site, it is likely tawny owl (Amber listed UK Conservation Status) numbers are not represented and are undervalued.	Built structures within the Farmland Extension Area were subject to detailed external and internal building inspection as part of surveys for bats. Internal inspections of these buildings did not identify any barn owls or signs of use by barn owl for nesting or roosting. Only a partial internal inspection of the farmhouse at Westdown Farm was possible due to a lack of boarding in the loft of the property. Also as part of bat surveys, buildings were subject to an extensive programme of emergence and re-entry surveys at dusk and dawn – the period when barn owls are most likely to be recorded. No observations were made during these surveys. Whilst there are a number of structures within the site and some suitable foraging habitat for barn owl, it is concluded that the level of site activity undertaken during dusk, dawn and nocturnal periods would expect to record incidental records of this species. Given the absence of records and level of survey within suitable built structures it was concluded that they were absent and no additional survey or assessment for them was required. Specific nocturnal surveys for tawny owl or other owl species were not undertaken. However, two likely nest sites/territories were identified, both just outside of the redline boundary. Impacts on tawny owl or other species would be limited to nesting and foraging habitats within mature woodland unaffected by the proposed quarrying activity. The

Topic	Summary of SES response	Applicant's rebuttal
		areas of woodland due to be lost to the proposed quarrying are more immature in nature and therefore unable to provide suitable structures for roost or nest sites. In addition, the amount of woodland to be lost is much smaller when compared to that which will be retained, and it is thus considered that there will be no impact on the tawny owl due to habitat loss/degradation. The proposed upfront off-site mitigation as illustrated in **Figure 2.1** of this response will also provide new potential barn owl habitat through the tussocky grassland and meadow where once there were none of these features. Over and above these comments, it should also be noted that the ES simply represents the beginning of the mitigation process. Detailed measures will continue to be discussed and agreed with regulators, through both the licensing process and the preparation of the detailed ecological mitigation strategy as part of any forthcoming consent.
Peregrine	Single peregrine observed in first breeding bird survey then no further recordings despite statement that a peregrine was heard calling intensively in June. It is noted a single peregrine was observed on the first breeding bird survey, the Breeding Bird Survey report then goes on to say there was no further recordings of this species, which contradicts a subsequent statement that a peregrine was heard calling intensively in June. The assumption in the Biodiversity Scoping Information report states peregrine is *'Assessed as being of insufficient biodiversity value for potential effects to be significant, as they are not considered to be breeding within 500m of the site and would not therefore be impacted by works'*. There is no robust basis for this conclusion considering the survey effort. Furthermore, the observation of a single peregrine is a likely scenario for a breeding pair at this time of year (noting peregrine usually lay their clutch at the end of March and early April) whilst the other adult incubates a clutch.	The second observation was not made within Westdown Quarry and was of a bird flying over the neighbouring disused Holwell Quarry to the southwest, recorded during a bat survey within the Farmland Extension Area. Though it is acknowledged that the observation could relate to a single bird whilst a second was incubating or laying a clutch, this is considered unlikely given the absence of any further observations within Westdown Quarry. Peregrine have been recorded at a number of local sites and the range of active and inactive quarrying locations provide multiple suitable nesting opportunities with 2km of Westdown Quarry. The site is suitable for them to breed, however with a number of potentially suitable nesting locations nearby it is possible that peregrines may alternate or use different locations.

Topic	Summary of SES response	Applicant's rebuttal
		We consider that our approach to survey for this species was robust and suitable to confirm successful nesting attempts within Westdown Quarry. We would however advise that update surveys and monitoring be undertaken to confirm the presence/absence of this species in advance of works that have potential to disturb the quarry faces thus ensuring that suitable mitigation can be employed and impacts on this species during construction or operation avoided. The availability of suitable nesting habitat in the wider area (which is extensive) would ensure that any loss of habitat would not result in a significant impact on this species. It should be noted that peregrines are known to become habituated to, and nest in, operational quarries, and there will always be a huge provision of suitable faces, either within the working quarry or retained faces in the Asham Quarry Void area.
Kingfisher	There is no consideration for breeding kingfisher in Fordham Water, a Schedule 1 bird under the Wildlife & Countryside Act 1981 (as amended). The banks along Fordham Water may support breeding kingfisher.	Fordbury Water and the woodland adjacent to it is maintained throughout the quarrying period. Specific surveys for kingfisher have not been deemed necessary as their habitat is not challenged by the proposed quarrying activity. Kingfisher are at risk of disturbance by human presence (dog walkers etc.) but are often found in environments that are affected by noise (e.g. nesting in close proximity to motorways etc.). It is not expected that the quarrying activity will result in greater levels of disturbance of kingfisher. The footpath that follows the valley will remain the likely source of any human disturbance.
Breeding birds	The impact assessment fails to assess or adequately set out mitigation for the substantial loss of breeding and foraging habitat for woodland and farmland birds in the intervening years of scheme completion. Large expanses of scrub such as that within the application site (recorded at 14ha to be cleared) is a rare inland habitat within the UK, and alongside almost 2000m of hedgerow, is of significant ornithology value, particularly for passerine birds. The ES fails to identify this, and SES are highly concerned with Wood PLC's	Whilst breeding birds were scoped out of the assessment at the Scoping stage, they were scoped into the assessment in the ES (ES Chapter 11 and ES Appendix 11D), albeit reaching the conclusion commented upon by SES. The approach used in reaching the conclusion however was justified in the ES Appendix 11D, drawing on published sources.

Topic	Summary of SES response	Applicant's rebuttal
	statement in the Biodiversity Scoping Information report that 'Breeding birds have been assessed as being of insufficient biodiversity value for any potential effects to be significant.' There appears to be an apparent theme of undervaluing throughout the biodiversity reports. It is also very surprising that surveys did not record avifauna that one would expect and are likely to inhabit the habitats within the application habitat, such as yellowhammer, corn bunting, and kestrel.	Any significant effects were ruled out taking into consideration the distribution of notable species and habitats most valuable to them (i.e. areas of mature woodland) alongside the proposed mitigation and compensatory measures to be embedded within the project, including the additional upfront planting along the site perimeter as illustrated in **Figure 8.9** of this response. The successional nature of the proposed quarrying and progressive restoration will provide a huge range of breeding bird habitats from bare ground to woodland. Furthermore, the proposed Schedule of Conditions (Appendix B of the Planning Statement) specifically conditions the provision of an ecological mitigation plan. Whilst it is acknowledged that the habitat lost to the survey includes extensive areas of scrub and arable habitats, our surveys found the breeding bird assemblage associated with these habitats to be dominated by predominately common and widespread species. Baseline surveys offer a snapshot of those present and there is no guarantee that all species that are anticipated would be recorded. As previously noted, our survey approach follows standard guidance (Gilbert et al 1998) and provided a suitable approach for recording and identifying the breeding bird assemblage within the site. The habitats present do offer potential to support yellowhammer, corn bunting and kestrel, however these were not observed during the surveys. The mitigation and compensation proposed, incorporates areas of woodland and hedgerow within the site that offers potential nesting and foraging habitats for a wide range of breeding birds including those highlighted whilst the wider area retains extensive areas of arable and hedgerow habitats suitable for farmland birds.
Bats – All species including greater and lesser horseshoe bats	HRA required – application site falls within Band B of the Bat Consultation Zone of the Mells Valley SAC, which is designated for its greater horseshoe bat feature.	As recognised by SES, a stand-alone report to inform HRA was submitted as part of the supporting documentation for the Westdown Quarry consolidating planning submission. SES acknowledges that they have chosen not to consider this HRA (page 11, paragraph 2 of SES response).

Topic	Summary of SES response	Applicant's rebuttal
	Replacement Bat Habitat / HEP: Any Replacement Bat Habitat provided for greater horseshoe bats should accord with the Mendip District Council Technical Guidance on Development (version 2.1) in respect of bat SACs (which includes the Mells Valley SAC) and include a calculation under the Habitat Evaluation Procedure (HEP). The HEP produced by Wood PLC incorrectly evaluates and calculates habitat for lesser horseshoe bats and Hestercombe House SAC, rather than Mells Valley SAC greater horseshoe bats. Therefore, habitat replacement and a separate calculation under the HEP is required for greater horseshoe bats. The Technical Guidance includes a requirement for mitigation and enhancement, rather than solely restoration which is what the existing ES proposes.	The Habitats Evaluation Procedure (HEP) was followed for the Westdown Quarry application at the request of SCC (as described in their Scoping Opinion/pre-application advice (2020) (ref. SCC/3703/2020/PA). Within this Scoping Opinion/pre-application advice the application of the HEP for a particular species was not described, hence as part of the application the HEP guidance document was reviewed, and discussions held (by telephone) with Larry Burrows (the advisor suggested by SCC). The discussion and published technical documents described the use of an individual species as a proxy for several others in the consideration zone, having similar ecological requirements (see paragraphs 86 and 87 of SCC guidance on HEP). As lesser horseshoe bats are present roosting within the site boundary, recorded in those areas used by greater horseshoe bats and use the site more extensively than greater horseshoe bats, it was determined that they were the best "umbrella species" to represent the site (i.e. the mitigation/compensation required for this species would be greater than that required, as prescribed by the HEP, than any other). On this basis, the relevant parameters for use within the HEP for lesser horseshoe bats were identified to the project by SCC. It is noted by SES in their response to the application that they consider this an error and the HEP should have been focused on greater horseshoe bat (also noting that a HEP for lesser horseshoe bats is also requested) in the same response. As the degree of overlap of lesser horseshoe bats with the works is more extensive, greater horseshoe bats do not roost on the site and habitat use is similar it is considered highly likely that the needs of lesser horseshoe bats will be greater than greater horseshoe bats making further calculations unnecessary.
	Any Replacement Bat Habitat provided for lesser horseshoe bats should accord with the Mendip District Council Technical Guidance on Development (version 2.1) in respect of bat SACs and include a calculation under the HEP specifically for lesser horseshoe bats	See comment above.

Topic	Summary of SES response	Applicant's rebuttal
	Habitat Restoration: The restoration of habitats is proposed to be sufficient in 30 years. During the subsequent phases, this will not compensate for the habitat loss in the short-medium term (and potentially long term at a cumulative level). The third test of Natural England European Protected Species Licencing states 'the action authorised will not be detrimental to the maintenance of the species concerned at a favourable conservation status in their natural range'. This is highly unlikely to be achieved. Favourable conservation status is defined in the Habitats Directive as: I. Population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats. II. The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future. III. There is, and will probably continue to be, a sufficiently large habitat to maintain its population on a long-term basis. There is a strong argument that the current strategy does not conform to points I and III.	The loss of habitat and the progressive restoration/provision of areas will take place over a 20-year period, while there will be 'up-front' habitat creation during the first phase of works, i.e. Years 1-5 as illustrated in **Figures 2.1** and **8.9** of this response. The earlier phases of habitat creation will begin maturing well before later phases of habitat loss. Additional information on the proposed progressive restoration of the site is set out in Chapter 8 of this response; Section 8.3 of which details the broad areas of habitat lost and gained during each phase of the proposed development. While there will be some habitats that do not reach fully maturity until around 30 years after creation, this does not mean that they will not provide valuable foraging and commuting opportunities for bats (and other species) in the interim. It is notable that many of the valuable habitats currently on the site are characterised by a mosaic of ephemeral and short perennial vegetative growth. These early successional habitats will become available at each phase of the development and will not take 30 years to offer value to bat species. On the basis of these points, there is a strong argument that the current proposal does conform to points I and III and, thus, will not be detrimental to the maintenance of the populations of bat species at favourable conservation status in their natural range. Indeed, Hanson will be required to further demonstrate this in a subsequent European Protected Species Licence application to Natural England, which will be required for progressing the vegetation clearance to allow both Westdown quarrying and the restoration of the Asham Quarry void.
	Quarry Face and Tree Roosts: There is no detailed strategy for the safeguarding of roosting bats (in regard to injuring / killing / disturbance) for the quarry faces and trees.	ES Table 11.10 specifies that *"Pre-construction checks will be undertaken at features that could be used by roosting bats prior to their removal and/or prior to being made inaccessible for use by bats (e.g. by light or noise)."* This includes pre-construction inspections of crevices with bat roosting potential and will be sufficient to safeguard against any breach in legislation. The detailed strategy for delivering this

Topic	Summary of SES response	Applicant's rebuttal
		would be delivered in liaison with Natural England via the licensing process. The applicant notes that mitigation will be defined and agreed during licensing discussions with Natural England to compensate for potential roost losses arising from works affecting quarry faces, and trees. Such measures may include a second bat barn and provision of a significant number of bat boxes for a range of species.
	The report states 'there are thousands of trees and hundreds of metres of exposed quarry face within the footprint of the Site Survey Area that may have the potential to support roosting bats. The cliff faces may also be used as a focal point for autumn swarming behaviour'. Both features could and probably are used all year round by roosting bats for various roosting purposes, and as it stands due to the lack of survey effort it cannot be determined how these roosts or potential roosts will be impacted from the destructive activities that are proposed. Injuring / killing / disturbance of bats is probable under the current proposals. Furthermore, there is no foundation for the assumption that these features are of 'low or moderate conservation value' as stated in the report. On the contrary, these roosts could be of high conservation value. Furthermore, as Bechstein's bats and barbastelles were caught, it should be assumed that they may utilise the quarry for hibernation, which in accordance with the Bat mitigation guidelines, Jan 2004 (Mitchell), page 39 is characterised as 'high' conservation significance. It should also be noted that 9% of the bats recently radio tracked used the quarry faces to roost.	Wood does not agree with the implication that insufficient survey effort has been deployed to assess the presence of roosting bats in the Site Survey Area. As has been noted, there are thousands of trees and hundreds of metres of exposed quarry face with the potential to support roosting bats. Employing traditional survey techniques such as roost inspections and emergence surveys on all of these crevice roosts would, therefore, be completely unfeasible, and the level of effort required would take either an extraordinarily large team of ecologists, or many years to complete. In some cases (e.g. the cliff face), this would simply be impossible due to the safety aspect of trying to access the potential roosts. On top of this, the survey effort would be vastly disproportionate to the value of the data being collected, which would provide only a snapshot in time and would not necessarily represent the status of the small crevice roosts at the time of works commencing – i.e. because such roosts are frequently used only by individual bats for very short periods. Section 6.3.6 of the Bat Conservation Trust guidelines addresses this type of scenario and states *"Where there are large numbers of trees, the efficiency and efficacy of PRF inspections and other techniques should be evaluated and alternative methods considered. In situations where there are a lot of trees to survey, such as in woodland, it may be more effective to consider advanced bat survey licence techniques (ABSLT) such as trapping and radio tracking to locate trees roosts."*

Topic	Summary of SES response	Applicant's rebuttal
		ABSLT were adopted on the application site, in line with the guidance, and the resulting survey data provides the foundation for the statements made in the ES. It is a valid and reasonable assumption that any roost of high conservation significance would have been identified through radio-tracking. We agree that there is the potential for multiple roosts of low to moderate conservation value to occur. Measures to avoid injuring/killing of individual bats and to compensate for destruction of such roosts would be built into the detailed mitigation strategy that will form part of a Natural England licence application. We would request that SES refer back to the Bat Mitigation Guidelines (Mitchell, 2004), page 39. The document indicates that, even for the rarer species, hibernation sites of small numbers are valued at no more than 'moderate' conservation significance. Roosts of 'high' conservation significance include: *"significant hibernation sites for rarer/rarest species or all species assemblages"; "sites meeting SSSI guidelines"; and "maternity sites of rarest species"*. Notwithstanding the above comments, it should also be noted that prior to any tree felling Hanson would carry out further assessment of trees to be lost to get an up-to-date idea of any potential roosts and survey as required.
	In addition, a greater horseshoe bat nursery site lies approximately 70m from the proposed quarry, which is functionally linked to the Mells Bat SAC. This roost is in the old Asham Stone Conveyor tunnel and is linked to a larger roost at Wadbury, near Mells. Looking at the proposals, it is highly likely large areas of the bat foraging / flight route network which likely serve the roost will be lost and thus will impact upon the integrity of the Mells Valley SAC and its greater horseshoe bat designated feature.	Again, we are concerned that SES is relying heavily on historical data and failing to consider the findings of the most up to date study, in contrast to their own advice on the lifespan of ecological survey reports. A comprehensive review of the data pertaining to the Asham Conveyor Tunnel was undertaken (see Tables 2.2 and 2.3 of the Bat Baseline Report, (ES Appendix 11B)). It was established that this historic greater horseshoe bat nursery roost has declined in use since the 1999 Billington study, with 2003 being the last confirmed

Topic	Summary of SES response	Applicant's rebuttal
		evidence of a nursery roost being present. This may be because the habitat of Asham Quarry Void has changed such a lot since 1999 when it was probably more valuable to great horseshoe bats (a point supported by the conclusions of the 1999 Billington study, which sought to arrest succession of the vegetation in Asham Quarry Void). In 2017, two juveniles were recorded inside the roost late in the season, however, it was unclear if this structure had been used as a nursery roost, or if these volant juveniles had travelled to the roost from elsewhere. While the Asham Conveyor Tunnel, therefore, continues to be used by small numbers of greater horseshoe bats during both summer and winter months, Wood found no evidence to justify it being classified as a "nursery roost" for greater horseshoe bats. It is also worth noting that during the period a confirmed nursery roost was present, quarrying activity was either ongoing, or recently completed (i.e. successional woodland etc would not have been present). Although we recognise that areas of habitat used by greater horseshoe bats from the Asham Conveyor Tunnel roost will be lost, evidence provided by the historical data review and current survey work indicates that this will impact only a small number of individuals. Furthermore, large swathes of the Asham Wood Void floor, notably those areas located within the floodplain, are to be retained as it is (open mosaic habitat), as are the open rock faces as illustrated in **Figure 8.8** of this response). No more than five individuals have been recorded roosting in the tunnel at any time since 2017, despite regular monitoring. Impacts on this roost have, therefore, been considered separately and we agree that impacts on this greater horseshoe bat roost required consideration (refer to ES section 11.21). We strongly dispute, however, that the small number of individuals that would be impacted is critical to the integrity of the SAC or that if this roost were lost it could have a detrimental impact on the overall status of the designated features of Mells Valley.

Topic	Summary of SES response	Applicant's rebuttal
		A separate, yet related point is that the conveyor tunnel has a long history of anti-social, unauthorised use, which prompted Hanson to grille the access to the tunnel. Despite this, individuals continue to break off locks and access the tunnel.
	In addition, the noise of blasting will likely cause significant disturbance. Further evaluation for bats should be considered inside and around the proposal, and a new roost for the species should be established further away from the quarry itself. A single crevice lost will not impact the conservation status of a species, however the loss of many roosting sites would be a major impact.	It is not entirely clear what this statement is referring to, it appears to reference the effects of noise on the Asham Conveyor Tunnel roost, and it is assumed that *"a new roost for the species"* refers to greater horseshoe bats; but it also seems to refer to *"further evaluation for bats" more generally, and references loss of "many roosting sites"*. Please refer to ES paragraphs 11.21.17 to 11.21.22, which assess the impacts of noise on the bat assemblage. In particular, it is stated: *"11.21.17 Roosting bats can be disturbed by noise and vibration. The assessment of these potential effects therefore focuses on bats known to be roosting at the Conveyor Tunnel in Asham Wood, Westdown Farm, and potentially roosting in trees in the vicinity of working areas.* *11.21.18 The roost at the Conveyor Tunnel in Asham Wood is ~100m from the nearest working area of the quarry and ~350m from the nearest point of blasting and areas of significant excavation. The Conveyor Tunnel is also situated at an elevated position and is surrounded by dense mature woodland which extends to the entire 100m between the roost site and the nearest working area. It is considered that the roost at the Conveyor Tunnel would be sufficiently shielded from noise and vibration at working areas by distance and dense woodland that any effects would be of a very low magnitude."* On this basis, a new roost created specifically to mitigate the effects of noise on the small greater horseshoe bat roost in Asham Conveyor Tunnel is neither justified nor proportionate to the scale of the impact.

Topic	Summary of SES response	Applicant's rebuttal
	Monitoring: There is no substantial information provided that addresses the short-medium term impacts or monitoring of existing roosts. A better strategy dealing with the short-medium term impacts is needed as well as a thorough monitoring strategy. It is vital that any replacement habitat is accessible to the horseshoe bat population affected. An Ecological Management Plan for the site should outline how the site will be managed for SAC bats for the duration of the development. Where appropriate a Monitoring Strategy also needs to be included to ensure continued use of the site by SAC bats and includes measures to resolve the situation if negative results occur.	The specific details of bat population monitoring for the duration of the development and beyond has not been finalised, as it envisaged that this would be refined in liaison with Natural England via the extant DAS agreement and detailed as part of the licensing process. The monitoring of both existing and newly created roosts would certainly form a core part of the strategy. The point about monitoring specifically for SAC bats using the site is noted, and it is agreed that monitoring of Fordbury Water as a key commuting corridor would form an important part of the monitoring strategy. Other on-site habitats, however, are not heavily or regularly relied upon by the SAC bats and monitoring of these areas specifically for greater horseshoe bats will be less appropriate.
	Bat Barn: The proposed bat barn next to a busy road will result in noise disturbance and increase vandalism risks. SES does not approve of this proposed location. Furthermore, this is clearly not sufficient mitigation for the number of roosts that will be lost. Structures being used by bats, particularly West Down Farm could be impacted way before the demolition of the building commences in prior phases. A new alternative roost and the necessary connection network before works commence is required. Any mitigation roost construction should be away from the disturbance areas and allow continued flight corridors to the other interlinked roosts.	The proposed location of the new bat barn is shown on ES Figure 11.1 as indicative (see also **Figure 2.1** of this response). The point about proximity (around 100m away) from a fairly busy road is, however, taken. The exact location can be adjusted accordingly and moved further south, away from the road, but within the same habitat corridor. Based on an assessment of the detailed radio-tracking survey data from the lesser horseshoe maternity colony being affected and drawing on extensive experience from previous mitigation schemes for lesser horseshoe bat maternity colonies, we must maintain that the new bat barn should be located within the habitat corridor identified in order to maximise the chances of it being successful. Although the specific design of the bat barn has not been finalised clarification on the potential design was provided in a response (Reference: 40380-WOOD-XX-XX-CO-J-0020_S2_P01) to SCC on 23rd July 2021 in reference to comments received from Natural England on the same subject (see also paragraphs 2.2.24 to 2.2.27 of this response). The response is repeated below for clarity.

Topic	Summary of SES response	Applicant's rebuttal
		*In their response Natural England state "Considering the level of importance of the large on-site lesser horseshoe maternity roost, further detail on the compensatory roost structures would be appreciated". As illustrated on ES Figure 11.1 'Offsite mitigation', the compensatory roost structure (referred to as the 'proposed bat house' on ES Figure 11.1) is to be provided on within the 18 ha area identified for off-site habitat mitigation on land within Hanson's ownership which lies immediately to the north of Westdown Quarry and to the south of the Bulls Green Link Road (see also **Figure 2.1**). As detailed in ES Table 11.10, the loss of the roost site at Westdown Farm (at approximately 15 years after the commencement of operations) will be mitigation and compensated for by the provision of identical or near-identical roosting opportunities to be created in Phase 1/Year1 of the operation phase. Additional roosting opportunities will be provided by way of concrete tunnel(s) to be buried in tipped materials in Asham Quarry Void in Phase 1 of the operation phase. Hanson will seek to work with Natural England, through the extant DAS as appropriate, as well as the local bat group to secure an appropriate design for the compensatory roost structure and habitat.* *As stated above, the compensatory roost structure (in conjunction with other upfront off-site mitigation will be provided at the outset, i.e. in Year 1, of the proposed development, the indicative details of which are provided below.* *The compensatory roost structure ('bat house') will be based on the design presented in the Lesser Horseshoe Bat Conservation Handbook[11] with modifications to include features for other bat species. The bat house will incorporate a loft space with 'hot box', a ground floor room suitable for light sampling, and a cool room suitable for hibernation. The building plan will be L-shaped with a minimum volume of 250 m3. The ground floor will have a celling throughout with access to roof voids though loft hatches and will provide suitable access to the loft for*

[11] Schofield, H. W. (2008) The Lesser Horseshoe Bat. Conservation Handbook. The Vincent Wildlife Trust, Ledbury.

Topic	Summary of SES response	Applicant's rebuttal
		lesser horseshoe bats. High humidity within the ground floor area will be achieved by creating an additional access point situated on the eastern aspect at ground level, with drainpipe leading from the roof into the house. Water from rain fall will flow into the house creating high humidity. A high security steel door with an opening (50 cm x 50 cm) with horizonal bars (15 cm apart) will be present to enable lesser horseshoe bats to access the ground floor and a second access with an opening (50 cm x 50 cm) with horizonal bars (15 cm apart) suitable for lesser horseshoe will be present with a mammal prevention panel below will be positioned at a different location. The door will also provide access for humans, in addition an access hatch will also provide human access for inspection. Rough surfaces such as exposed timbers and bitumastic felt will be present throughout the bat house at varying heights to provide perching opportunities, allowing bats to hang from. Where required baffles will be present to reduce light spillage. *The roof will consist of concrete roof tiles or slate and will contain ventilated ridge tiles to allow bat to access and tiles in the roof to allow bat to access providing roosting opportunities for a variety of crevice dwelling species. The roof timbers will be a cut and pitch construction with joists and rafters providing an uncluttered space for bats to fly. A loose fitting bitumastic felt will be used with tears to allow bat access into the loft for a variety of bat species. Access points for crevice-roosting species will be provided on all aspects. The structure will consist of brick internal leaf, and brick internal walls.* Additionally, as specified in ES Table 11.10, additional roosting opportunities will be provided by way of concrete tunnels to be buried in tipped material in Asham Quarry Void in Phase 1 of the operation phase. Again, the exact design of these will be finalised in liaison with Natural England as well as the local bat group. As specified in ES Table 11.14, the replacement roost is scheduled to be constructed during Phase 1 (and likely within the first 2 years of

Topic	Summary of SES response	Applicant's rebuttal
		development), where no works will take place within 50m of the Westdown Farm for at least 10 years. The only man-made roost structures being lost are the Westdown Farmhouse and an associated well. The combination of the new bat barn and buried concrete tunnel roosts is clearly sufficient mitigation for these.
Badgers	The Biodiversity Chapter states 24 badger setts are required to be closed, comprising of three social groups. The Badger Baseline Report states 26 setts may require closure, including three main setts. Neither report sets out safeguarding measures for respective social groups, which will lose significant areas of their territories, nor how / where proposed artificial setts will be installed at a location that does not jeopardise animal welfare. There are concerns of how social groups that inhabit a significant number of active setts can be successfully displaced in the immediate landscape. Clarification is needed.	The Biodiversity Chapter (ES Chapter 11) is correct in stating that 24 badger setts (comprising 2 main and 22 non-breeding setts) are required to be closed, relating to three social groups. Environmental measures proposed to minimise the potential for significant effects in respect of badger setts and territory losses predicted are set out in Section 11.8 (Tables 11.9 and 11.10) of the ES Biodiversity Chapter. Environmental measures are detailed separately for each badger social group impacted and include timing of provisions with respect to each development Phase. Environmental measures detail the provision of artificial setts including the areas where main setts will be created, and the creation of foraging habitat. Due to the multi-phase, 20-year programme, final details of badger mitigation will be based on detailed design and update badger surveys in areas to be affected prior to each Phase of works. The environmental measures would be detailed within a LEMP and a Badger Mitigation Licence. The measures will be implemented on Site in accordance with these documents. These will facilitate the closure of breeding setts and ensure provision of continuous foraging habitat for affected social groups throughout the lifespan of the project. The applicant notes that mitigation detail will be defined and agreed during licensing discussions with Natural England to compensate for loss of foraging habitat.

Topic	Summary of SES response	Applicant's rebuttal
		It should be noted that Hanson has declined the opportunity to allow badger culling at Westdown but that land adjacent to the site was part of the cull.
Survey data & methodology		
Scope of surveys		Scope of the various surveys undertaken to the inform the ecological assessment (EcIA) for Westdown were detailed in the applicant's Scoping Report (2020). In Council's Scoping Opinion/pre-application advice (2020), comments from both the County ecologist and Nature England in response to the applicant's scope of ecological surveys were outlined. These comments were duly noted and taken into consideration, and throughout the EIA process both the County ecologist and Natural England have been kept informed by email and phone as appropriate, including entering into a formal Discretionary Advice Service (DAS) agreement with Natural England. At no point throughout this process did the County ecologist express concern regarding the scope of the surveys being undertaken.
Survey data – otter, water vole, reptiles and breeding birds	Survey data for otter, water vole, reptiles, and breeding birds (see below) are more than 24 months old. Due to the transient nature of these species, surveys should be updated to inform impact assessment (see lifespan of survey reports https://cieem.net/wp-content/uploads/2019/04/Advice-Note.pdf). This is particularly important for water vole and reptiles that were scoped out of the Biodiversity Scoping Information Report.	At the time of the writing of the EcIA the data was less than 24 months old (as it was at submission). Regardless, the pertinent question is whether or not there have been changes on the site that would make it likely that a marked change in the baseline is likely to have become evident over a relatively short period (noting that the baseline will always be dynamic, so a marked change would need to be predicted to make the data invalid). As the site has remained "closed" and active management is not ongoing, (with the exception of the Asham Wood SSSI, for which Hanson has an active, Forestry Commission and Natural England approved management plan) it is not expected that any changes would be detected. It is also notable that many large projects covered under the Planning Act 2008 that have received consent have done so with data more than 2 years old. This, as at Westdown, has largely been that the large and complex areas being surveyed mean that the age of the data at

Topic	Summary of SES response	Applicant's rebuttal
		submission is generally older than, for example, data generated on a green field site allocated for modest residential development. It should be noted that the ES simply represents the beginning of the mitigation process. Detailed measures will continue to be discussed and agreed with regulators, through both the licensing process and the preparation of the detailed ecological mitigation strategy as part of any forthcoming consent.
Reptile surveys	Timing of reptile surveys	The influence of weather, seasonality and time of day on reptile detection is complex and may vary depending on a wide range of factors. There are numerous publications that suggest differing 'optimum' temperatures for reptile surveys in the UK, and the 'actual' optimum will vary according to the time of year (life stage of the reptile), the species, and the geographical location (i.e. the same rules do not apply to both Somerset and Scotland). Our surveys were led by competent surveyors, with extensive experience of reptile survey work in the southwest of the UK, and any surveys that could not be undertaken in suitable weather conditions were rescheduled. Froglife guidelines do state that successful surveys can be carried out throughout the summer months and, our experience from other sites is that surveys under suitable weather conditions during these months can yield peak counts. Time of day is also less important than the conditions in which the survey is being conducted. Survey visits were conducted across three separate months, incorporating the peak season of September. There is no specific requirement to survey specifically in the months of March, April or May in order to detect reptile presence. The number of survey visits (18) also far exceeded the minimum specified in the Froglife guidelines for detecting presence/likely absence (7), with more than double the recommended number of survey visits completed. Over and above these comments, it should also be noted that the ES simply represents the beginning of the mitigation process. Detailed

Topic	Summary of SES response	Applicant's rebuttal
		measures will continue to be discussed and agreed with regulators, through both the licensing process and the preparation of the detailed ecological mitigation strategy as part of any forthcoming consent.
	Location of survey mats outside the application site and do not appear to spread out across the application site, instead congregated together in linear strips, primarily on existing tracks that likely endure regular disturbance.	The deployment of refugia focussed on sampling areas of optimal reptile habitat, to maximise the chances of reptiles being detected, balanced with considerations of surveyor accessibility and maximising the surveyors' ability to re-locate the mats once placed in this extensive site. It is accepted that mats were placed in areas that ultimately ended up outside the site boundary – this was due to a change in boundary (as indicated in paragraphs 11.4.1 and 11.4.2 of ES Chapter 11) after the survey completed – but this does not adversely affect the results. Instead we suggest that it provides contextual information, and further focus in contiguous areas of habitat that offered optimum chance of detecting any reptile population present. While the entire site is approximately 67 hectares (ha), we suggest that not all of this could be deemed suitable / or optimal reptile habitat. There are 33 hectares of arable within the site, much of which would not be suitable. Although two transects of mats were placed in this area, these were alongside habitat features contiguous with the former quarried areas and therefore were the most likely locations for reptiles to be recorded if present. Our contention is that 425 mats is sufficient – with 345 located across the 34ha of quarry (i.e. 10 per hectare), and a further 80 located in arable but alongside habitat features contiguous with the former quarry habitat. Additionally, as indicated above, the number of survey visits (18) also far exceeded the minimum specified in the Froglife guidelines for

Topic	Summary of SES response	Applicant's rebuttal
		detecting presence/likely absence (7), with more than double the recommended number of survey visits completed. We strongly dispute the claim that our surveys do not adhere to guidelines, and that our survey is not *"robust nor sufficient for impact assessment of a scheme of this scale"*. Our impact assessment has taken the cautious approach of assuming that a low population of reptiles may occur on the site, despite considerable survey effort failing to detect a single animal. We maintain that, if more than a low population of any reptile species were present, we would have detected presence, as a minimum. The assumption of a low population is, therefore, sufficiently robust for impact assessment for this project.
Breeding bird surveys	Concern about the timing, results and overall ornithological assumptions / competency of breeding bird surveys.	The survey season for ornithology was impacted by a period of cold and poor weather which resulted in cancellation and re-arrangement of survey dates to enable collection of surveys during the allocated period. Resulting in a slightly longer gap between the 2nd and 3rd visits than planned. It is acknowledged as a limitation of the surveys that a March visit was not completed which could have resulted in under-recording of some early breeding species such as song thrush or dunnock. However, as part of the winter walkover surveys, a survey was also completed on the 27th February 2019. Using this in comparison with the results of the breeding bird surveys it was not felt that there had been an under recording of resident or early breeding bird species. Also highlighted in the limitations to the surveys was logistical allowances for surveys being completed in operational and controlled premises. Whilst every effort was made to start and finish surveys as early as possible, it was common to encounter unplanned problems and delays at operational sites and also to have to work within the constraints created by the nature of the sites.

Topic	Summary of SES response	Applicant's rebuttal
		Whilst there were some issues with timing of surveys, it is felt that the survey programme provides a robust and suitable level of detail to enable assessment with respect to breeding birds.
	Breeding bird survey data is more than 24 months old and for a scheme of this scale is not considered valid.	See comment on age of data provided above.
Bat surveys	**Radio tracking:** Tagging one pregnant greater horseshoe bat is not considered adequate to establish foraging / commuting / social functions of a site, particularly in relation to the impacts on the Mells Valley SAC and noting Bat Conservation Trust Good Practice Guidelines (Collins 2016): *'Radio tagging and tracking surveys should be proportionate to meet the survey objectives. The tracking of one or two bats to determine habitat use and population home ranges will not be sufficiently robust. Equally, tracking more than two bats simultaneously from the same population may be unnecessary should the objective of tagging and tracking be to locate a sample of breeding roosts (although this is species-dependent). For surveys investigating habitat use and activity patterns of breeding colonies, at least 5–10% of the (estimated) population should be marked, and for rare species up to 25% of the animals of a population if potential impacts are high'*.	It is noted that the Mells Valley SAC guidance provides no recommendations in relation to survey effort for Advanced Licence Bat Survey Techniques (ALBST). The Bat Conservation Trust guidance on ALBST is clear that radio-tracking should be tailored to meet the survey objectives, and that use of ALBST is *"a process of balancing the data requirements to meet the objectives of the survey with the level of potential impact on bats or bat populations from using the technique"*. Establishing the right balance, in this scenario, was achieved with the advice of the expert who helped develop the Bat Conservation Trust guidelines for ALBST. Daniel Whitby of AEWC Ltd, who was subcontracted to conduct and advise on these surveys for the project, was also the specialist reviewer/contributor for the ALBST chapter of the guidelines. The objective of the survey work was not to establish habitat use and activity patterns of the Mells Valley SAC greater horseshoe colony but was specifically to establish the use of the Westdown Quarry site by greater horseshoe bats (which may form part of the Mells Valley SAC colony). It should be noted however that the SES comment is incorrect – two greater horseshoe bats were tagged, which alongside the other techniques, was considered sufficient to establish the use of the Westdown Quarry site by greater horseshoe bats. Based on a combination of standard survey techniques (automated monitoring and manual transects), along with the ALBST (trapping), it

Topic	Summary of SES response	Applicant's rebuttal
		was determined that the Survey Site itself was not of significant value to greater horseshoe bats. As such, the decision was made that the value of tracking a large enough sample of the population to establish home ranges would not outweigh the impact of using that intrusive method. This approach was agreed in consultation with Natural England via the DAS process, and correspondence received from Natural England on 22/05/2020 responds in relation to the survey effort for greater horseshoe bats: *"Natural England considers that you have gathered enough evidence to inform an assessment of the impacts likely to arise from the site proposals and to identify suitable avoidance and mitigation measures. The combination of survey methods used provides a good basis for understanding use of the site by GHB"*.
	Automated survey effort: Whilst the survey effort does accord to Bat Conservation Trust guidance, it does not accord with the Mells Valley SAC Technical Guidance, which states *'The main survey effort should be that using automated detectors. Automatic bat detector systems need to be deployed at an appropriate location (i.e. on a likely flyway). Enough detectors should be deployed so that each location is monitored through the survey period in order that temporal comparisons can be made. The period of deployment should be at least 50 days from April to October and would include at least one working week in each of the months of April, May, August, September and October (50 nights out of 214; ≈25%).* Only three automated bat detectors were used as part of baseline surveys, which does not accord with the Mells Valley SAC Technical Guidance.	The level of survey effort recommended by both the Bat Conservation Trust (BCT) and the Mells Valley SAC guidance was fully considered throughout the design of the bat survey work. It is noted, however, that neither the BCT guidelines nor the Mells Valley SAC guidelines directly address the bat activity survey effort that would be required where Advanced Licence Bat Survey Techniques (ALBST) are also being employed at the Site. As such, the specific survey approach was guided by the documents, but developed using professional experience to ensure relevance to the current Site Survey Area and to take account of emerging survey data. This is in accordance with the BCT guidance which states in Section 2.2.8: *"A competent ecologist should, as appropriate, modify their approach from that of published good practice or standing advice issued by a statutory body where, for example:* *a) it is necessary to adapt to the specific requirements of a case or site;* *b) an innovative approach might improve upon published good practice and/or provide a more valuable outcome".*

Topic	Summary of SES response	Applicant's rebuttal
		It should further be noted that the approach taken, and level of bat activity survey effort employed, was subject to extensive consultation with Natural England through the Discretionary Advice Service (DAS). Please refer to Appendix D – Natural England Discretionary Advice Service Documented Correspondence, contained within ES Appendix 11B – Bat Baseline Report. The ALBST adopted provided data of far superior quality and reliability than that being gathered using standard bat activity survey techniques, such as automated monitoring. On this basis, Natural England agreed that the level of survey effort was reasonable and proportionate, and that the implementation of ALBST justified the "scaling down" of the standard bat activity survey effort. As provided in the submitted documentation, on 28/08/2019, following a consultation meeting, Natural England stated: *"we discussed Advanced Licence Survey Techniques you are undertaking and that this would yield more useful and reliable data than that which can be gathered by standard bat activity surveys. We support the approach being taken, which is likely to significantly enhance understanding of how several bat species use the landscape in and around the quarries. The information will provide a strong basis for designing mitigation, compensation (in the context of any licensing needs) and habitat enhancements"*. We maintain that the survey effort adopted has established a far more robust baseline of bat activity on the site than would have been achieved simply through increasing the volume of automated acoustic data collection in order to comply with the recommendations set out in the Mells Valley guidance document.
	Furthermore, it is considered that automated surveys should have tested other locations within the site boundary, rather than surveying	This statement appears to suggest that the automated monitoring locations should have varied through the survey period, rather than consistently monitoring the same locations. This contradicts the

Topic	Summary of SES response	Applicant's rebuttal
	the same areas as this does not necessarily reflect the scale of the impacts site wide.	previous statement made by SES, where it is emphasised that detectors be deployed *"so that each location is monitored through the survey period in order that temporal comparisons can be made"*. Furthermore, Natural England also reiterated that survey effort split across seasons must ensure consistent use of monitoring locations so that temporal comparisons can be made. This is set out in their DAS communications on 22/05/2020: *"One thing that we would advise, to allow for comparison and consistency between the two partial years of survey, for example, by using the same locations for static and transect recording"*. Our automated monitoring locations were specifically maintained throughout the survey period for this purpose and, while we recognise that moving detectors between locations might offer wider site coverage, it would have provided a small snapshot in each location, rather than allowing temporal trends and seasonal changes in activity to be assessed.
	In addition, the Biodiversity Chapter states that greater horseshoe bats were recorded 'predominantly within densely vegetated corridors within the Fordbury Water corridor'. However, this is contradicted by the Bat Baseline report which states 40% of the greater horseshoe bat records were from other parts of the application site. Therefore, these other areas cannot be dismissed as negligible for greater horseshoe. This is further reinstated by Geoff Billington's large scale radio-tracking survey on greater horseshoe bats that identified key commuting and foraging routes throughout, including Westdown Farm hedgerows, the bottom of Asham Void, the woodland between Asham and Westdown, and the faces of the old Westdown quarry.	The assessment does not dismiss other areas of the Site as "negligible" for greater horseshoe bats. The assessment clearly acknowledges the use of the Site by foraging and commuting greater horseshoe bats, including individuals from the Mells Valley SAC colony (refer to ES Section 11.11). The survey data, however, indicated that a low to moderate number of greater horseshoe bats used the habitats on the Site itself for commuting and foraging on an infrequent basis. Activity levels for this species were generally low on the Site, although the Fordbury Water corridor and connecting habitats branching off from this were identified as being of greatest value. The baseline assessment fully reviewed the findings of Geoff Billington's radio-tracking study (see Section 2.2.11 of the Bat Baseline Report (ES Appendix 11B)), however, it must be recognised that the

Topic	Summary of SES response	Applicant's rebuttal
		study is more than 20 years old (undertaken in 1999). As pointed out by SES in their response, CIEEM guidance on the lifespan of ecological reports and surveys indicates that data more than three years old is typically considered to be invalid. The local landscape has undergone several changes in the intervening period, including the upgrade and introduction of lighting to roads that pass between the Mells Valley SAC and the application Site, which will have caused severance of some commuting routes and may explain the findings of the more up to date study. While the historical study, therefore, provides some valuable contextual data that has been considered for the purposes of the assessment, we rely on the more current and up to date information that has been gathered specifically for the application Site. Furthermore, this data also takes into account the natural succession of the vegetation that has occurred in the 20 years since the Billington study was published.
	Manual Transect Surveys: The Bat Baseline report states each transect was visited one evening per month from June to October 2019, and April to May 2020, with an additional pre-dawn survey visit undertaken within the same 24- hour period in July 2019. This represents a total of seven survey visits (with two visits completed in the same 24-hour period counting as a single visit). Survey guidelines state 'up to two visits per month'. For a scheme of this scale with such significant importance to bats, it is expected that a full 10 visits would be undertaken.	As above, in our response to the level of survey effort employed for automated bat activity monitoring, we maintain that the ALBST survey effort adopted has established a more robust baseline of bat activity on the site than would have been achieved simply through increasing the number of manual transect survey visits from 7 to 10. Through DAS consultation, Natural England agreed that the level of survey effort was reasonable and proportionate, and that the implementation of ALBST justified the "scaling down" of the standard bat activity survey effort.
Cumulative effects		
Cumulative effects on biodiversity	The Cumulative Effects section of the Biodiversity Chapter takes a blanket approach to assessing effects, stating *'It is assumed that mitigation and monitoring strategies employed at [respective project] will ensure that there are no significant cumulative changes to the potential receptors identified in Section 11.7 and 11.10-11.25 of this chapter'*. This approach does not sufficiently assess the cumulative effects, particularly with regards (but not limited to) to dust, water (i.e.	Cumulative effects are assessed in a comprehensive assessment in the ES. The assessment takes account of: • Any of the individual environmental effects arising from the proposals combine to create a significant cumulative effect; and

Topic	Summary of SES response	Applicant's rebuttal
	changes to water tables, flow rates throughout brooks and rivers), acoustic disturbance (including vibration), and lighting. The cumulative effects are considered to be significantly underplayed and do not provide any detail in how the effects of the reopening of Westdown Quarry in combination with existing quarries and proposed development in the immediate vicinity and wider landscape will affect the functioning environment and biodiversity. …	• Effects arising from the proposals could be combined with similar effects from other nearby comparable sites and/or other development proposals to result in significant cumulative effects. In terms of the latter, cumulative effects with respect to biodiversity are addressed in the ES Biodiversity Chapter (see ES Section 11.26) and are summarised in ES Chapter 16 Cumulative Effects. Regarding the former. ES Chapter 16 also addresses cumulative effects of the reopening of Westdown Quarry as a whole. The focus of this assessment is on the **'in combination effects'** of the proposed development, i.e. the cumulative water, ecology, noise, vibration, landscape (including lighting) etc, and concludes no significant long-term cumulative effects.
	Biodiversity chapter lacks consideration for potential effects through hydrological alterations …	SES appears to have been selective in its use of an example to demonstrate apparent lack of consideration of biodiversity effects through both hydrological and cumulative hydrological impacts. In respect of the Seven Springs example the ES Water Environment chapter, paragraphs 10.10.25 to 10.10.27, concludes that 'the level of effect on the Seven Springs is negligible to minor and not significant'. As a result it is not considered appropriate or necessary to then consider consequent effects on biodiversity. The approach taken to scoping sites, habitats and species in for further biodiversity assessment, or out of further assessment is detailed in ES Section 11.7 and is consistent with CIEEM (2018) guidance. Whilst it is accepted that this does not explicitly include assessment of potential effects at every off-site feature that the ES Water Environment chapter includes, the Zones of Influence in the assessment for water level and water quality effects are stated in Table 11D.2 in ES Appendix D, and had any potentially significant hydrological effects been predicted in respect of off-site feature included in the ES Water Environment chapter, then their relative importance would have been considered

Topic	Summary of SES response	Applicant's rebuttal
		and they may have been scoped in for the further biodiversity assessment. The same applies in respect of receptors potentially affected by dust and noise disturbance. We do not therefore agree that the ES Biodiversity chapter lacks consideration for potential effects through hydrological alterations. The selection of receptors for assessment has in fact been informed by the ES Water Environment assessment.

2.3.2 In January 2022, SES provided further comments in response to the applicant's rebuttal to their October 2021 comments. These further comments were discussed in a Teams meeting on 20th January 2022. As a result of these discussions, the following additional information was identified as being required to further address the areas of concerns outlined by SES:

- **Biodiversity net gain (BNG)/HEP** – SES maintained that Hanson have not demonstrated by a quantitative means that they are providing no net loss in biodiversity and that the HEP has in effect been superseded by BNG/Defra Metric 3.0 and should therefore be applied to Westdown. Where it is strongly felt by Hanson that Metric 3.0 is not appropriate, reaching an agreement to that affect with NE would provide LPA with sufficient evidence.
- **Ash Dieback** – SES requested written confirmation of the information outlined in the meeting on Hanson's existing Asham Wood management plan and the intention for this to be updated to address Ash Dieback as well as a copy of the Woodland Management Plan be provided as further information.
- **Ecosystem Services Assessment** – At the meeting it was outlined that the EcIA only forms part of an ecosystem services assessment which considers a much wider range of issues; furthermore, such assessments are not commonly required, even for NSIP or DCO applications. SES requested the relevant information was collated and summarised for clarity.
- **Brown trout (priority species)** – The applicant explained that this species had been addressed through the water assessment which concluded there would be no significant adverse effects on Fordbury Water. It was agreed further text to clarify this would be provided.
- **Bats** – the following additional information was identified as being required:
  - HEP for greater horseshoe bats (GHB);
  - Regulation 9 report for lesser horseshoe bats (LHB);
  - Demonstrate adequate mitigation is provided in short-, medium- and long-term;
  - Roosting bats – SES considered that sufficient information had not been provided to establish impact on roosting bats requiring further survey work. Hanson/Wood acknowledged that surveys represent a snapshot in time but considered that the surveys conducted to date represented a robust basis for the determination of the planning submissions. A willingness to conduct further, post approval survey work to refine mitigation plans and to progress subsequent European Protected Species Licence applications, was, however, acknowledged.

2.3.3 Consequently, the following additional information has been collated and presented in the following sections of this chapter.

2.3.4 As suggested by SES at the January meeting, repeated requests by the applicant to meet with SES to discuss bat mitigation measures included in the proposed development and any enhancements thereof, have at the time of writing been unsuccessful. The applicant

welcomes the opportunity to further discuss this issue with SES at their earliest convenience.

2.4 Biodiversity Net Gain (BNG) / Habitat Evaluation Procedure (HEP)

2.4.1 As previously detailed in both the response to Natural England (see paragraphs 2.2.14 to 2.2.17 above) and the rebuttal to SES (see **Table 2.2** above), the Habitat Evaluation Procedure (HEP) method has been used as opposed to DEFRA's Biodiversity Metric in accordance with extant local policy as set out in the extant Somerset Minerals Local Plan (2105), notably paragraph 14.9 and Policy DM2, and in Policy DP5 of extant Mendip District Local Plan 2006-2029 Part 1: Strategy and Policies (2014). Furthermore, the use of the HEP method was set out in the Council's Scoping Opinion/pre-application advice (2020) (ref. SCC/3703/2020/PA).

2.4.2 Somerset Minerals Plan Policy DM2: Biodiversity and Geodiversity reads as follows:

"Planning permission for mineral development will be granted subject to the application demonstrating that:

a) The proposed development will not generate unacceptable adverse impacts on biodiversity and geodiversity; and

b) Measures will be taken to mitigate to acceptable levels (or, as a last resort, proportionately compensate for) adverse impacts on biodiversity and geodiversity. Such measures shall ensure a net gain in biodiversity where possible. The Habitat Evaluation Procedure will be used in calculating the value of a site to species affected by the proposal where the conservation value of the habitat is considered to be replaceable and mitigation techniques have been proven.

The weight of protection given to a site will be that afforded by its statutory or non-statutory designation, its sensitivity and function in maintaining the biodiversity of the county and its role in maintaining the connectivity and resilience of the county's ecological network.

A 'test of likely significance' will be required for mineral development proposed which directly affect European and internationally designated sites and in areas that ecologically support the integrity of these sites."

2.4.3 As is demonstrated by the HEP calculations for both greater and lesser horseshoe bats[12] a net gain is being provided. The approach taken is in line with Policy DM2 both in terms of provision of a biodiversity net gain and the method of calculation.

2.4.4 The Mendip District Local Plan 2006-2029 Part 1: Strategy and Policies Policy DP5: Biodiversity and Ecological Networks reads as follows:

"The Council will use the local planning process to protect, enhance and restore Somerset's Ecological Network within Mendip.

1. All development proposals must ensure the protection, conservation and, where possible, enhancement of internationally, nationally or locally designated natural habitat areas and species.

[12] HEP calculations for greater and lesser horseshoe bats are detailed in Section 2.8 and Appendix C of this response.

2. *Proposals with the potential to cause adverse impacts on protected and/or priority sites, species or habitats are unlikely to be sustainable and will be resisted. Exceptions will only be made where:*

    a. *the impacts cannot be reasonably avoided,*

    b. *offsetting/compensation for the impacts can be secured,*

    c. *other considerations of public interest clearly outweigh the impacts, in line with relevant legislation.*

Offsets as mitigation or compensation required under criterion b) will be calculated using Somerset County Council's Biodiversity Offsetting methodology."

2.4.5 As is demonstrated by the HEP calculations (noted on Somerset County Council's website as a form of biodiversity offsetting) for both greater and lesser horseshoe bats[13] a net gain is being provided. The approach taken is in line with Policy DP5 both in terms of provision of a biodiversity net gain and the method of calculation.

2.4.6 The request by Somerset Ecology Services (SES) for the use of Biodiversity Metric 3.0 (noting that this would now be Biodiversity Metric 3.1, as published in April 2022) to account for biodiversity net gain is understandable given the rapidly evolving nature of this sector following the passage of the Environment Bill 2021. However, this does not recognise that the Environment Act provides that all planning permissions granted under the Town and Country Planning Act 1990 (and the Planning Act 2008 for nationally significant infrastructure projects) will be subject to a condition for biodiversity net gain that must be met before the development commences – see Part 6, paragraph 98 and Schedule 14 of the 2021 Act. However, the re-opening of Westdown Quarry is predominantly being sought under the provisions of the Environment Act 1995 (for the ROMP element) and the Planning and Compensation Act 1991 (for the IDO elements). Only a small part of the site (the access and site office area in the north) is being permitted under the provisions of the Town and Country Planning Act 1990.

2.4.7 Further, the Government's consultation document *"Consultation on Biodiversity Net Gain Regulations and Implementation - January 2022"* states for ROMPs (see page 35) *"As a new permission is not being granted, we do not generally consider it reasonable to attach the mandatory biodiversity gain requirement to old permissions during these reviews"*. Although this consultation is referring to mandatory biodiversity gain, it is implicitly describing the system to calculate the losses and gains as produced by Natural England (i.e. Biodiversity Metric 3.1).

2.4.8 The position is therefore clear, there is no legislative or policy requirement or justification for seeking application of the DEFRA BNG metric across the entire Westdown site.

2.4.9 In summary, the applicant has demonstrated the delivery of a biodiversity net gain calculated in a manner that accords with relevant extant local planning policy. The applicant also does not recognise the need to undertake further calculations using Natural England's Biodiversity Metric 3.1 as this approach would be considered to be

[13] HEP calculations for greater and lesser horseshoe bats are detailed in Section 2.8 and Appendix C of this response.

unreasonable, based on the current views of Government (as expressed in their consultation document).

2.5 Ash Dieback

2.5.1 Hanson own the majority of and actively manage the Asham Wood SAC and have an active woodland management plan in place. A copy of the Hanson *Asham Wood Woodland Management Plan from 2015 to 2025* is appended at **Appendix B**.

2.5.2 Hanson are actively liaising with Natural England and the Forestry Commission to manage Asham Wood SAC and the areas of secondary woodland in the face of Ash Dieback, including seeking to update their woodland management plan. The updated woodland management plan will reflect a new strategy to retain ash that show resilience to the disease and to guard natural regeneration of other species within the coppice blocks, e.g. field maple, oak, birch, and also look into collecting and growing on-site small leaved lime and oak for planting. It is not known how Ash Dieback will affect the woodland and as such, all relevant parties are working together to plot a course to the best of their knowledge and experience. Positive management of Asham Wood will be undertaken independently of the proposed quarrying activity at Westdown.

2.6 Ecosystem Services Assessment

2.6.1 The ecological impact assessment (EcIA) outlined in ES Chapter 11 (and supporting appendices), as well as the submitted stand-alone Habitats Regulations Assessment (HRA), only form part of the of an ecosystem services assessment which considers a much wider range of issues; furthermore, such assessments are not commonly required, even for NSIP or DCO applications. As such, it is considered that an ecosystem services assessment is not relevant to the submitted Westdown Quarry applications.

2.7 Brown trout (priority species)

2.7.1 Brown trout, if present, would be found in Fordbury Water. As set out in Table 11D.1 in ES Appendix 11D 'Biodiversity Scoping Information', Fordbury Water was scoped out of the EcIA as follows:

"Fordbury Water, a flowing stream, runs through the centre of the Site, running from the south west to the north east. The characteristics of Fordbury Water have been assessed against the River priority habitat criteria and it does not meet these. Therefore Fordbury Water is assessed as being of insufficient biodiversity value for potential effects to be significant from a biodiversity perspective, although effects are assessed from a Water Environment perspective in Chapter 10."

2.7.2 As indicated, the potential impacts on Fordbury Water have been assessed through the water environment assessment in ES Chapter 10. This assessment has concluded that there would be no significant adverse effects on Fordbury Water (see paragraphs 10.10.3 – 10.10.5). Consequently, it is considered there would be no reason why trout populations should be adversely affected. Indeed, the quarry de-watering water, from both Westdown and Torr Works) would ensure stream flows are maintained at all times.

2.8 Bats

2.8.1 From the SES comments (January 2022) in response to the applicant's rebuttal to their October 2021 comments and as discussed at the meeting in January 2022, it was identified that additional information was required to address SES concerns in relation to bats, namely:

- HEP for greater horseshoe bats (GHB);
- Regulation 9 report for lesser horseshoe bats (LHB);
- Demonstrate adequate mitigation is provided in the short-, medium- and long-term;
- Roosting bats.

2.8.2 Each of the above are addressed in turn below.

2.8.3 At the January 2022 meeting it was identified that a further meeting, preferably on site at Westdown, to discuss the proposed bat mitigation measures at Westdown between the applicant and SES would be beneficial. In preparing and collating the additional information in response to the Regulation 25 request, Hanson/Wood have repeatedly sought to arrange such a meeting with SES but have at the time of writing and submission not received any response for a site meeting to facilitate matters. Nevertheless, the opportunity to meet with SES at the earliest opportunity is warmly welcomed.

HEP for greater horseshoe bats

2.8.4 The SES response to the application (dated 19/01/2022) provides the following statement with regards the Habitats Evaluation Procedure (HEP) and greater horseshoe bat:

"Mells Valley SAC and greater horseshoe bats

The application site is located within Band B of the Bat Consultation Zone of the Mells Valley SAC, which is designated for its greater horseshoe bat feature. A HRA will therefore be required in respect of the Mells Valley SAC, specifically in relation to the impacts upon greater horseshoe bats. In order to inform the HRA process, a HEP calculation specifically for greater horseshoe bats is required. In producing the HEP calculation reference should be made to the Mendip District Council Technical Guidance on Development (version 2.1) in respect of bat SACs (which includes the Mells Valley SAC). The HEP calculation produced in respect of lesser horseshoe bats cannot be used to inform the HRA process as each horseshoe species have a different scoring system."

2.8.5 The applicant has reviewed the Mendip District Council Technical Guidance on Development (version 2.1) and produced a HEP calculation for greater horseshoe bat based on the information it contains.

2.8.6 There are no greater horseshoe bat roosts within close proximity to the Site, although the closest is within 4 km. With regards the HEP calculation all areas of the Site have been attributed to density band B. Greater horseshoe bats were identified both commuting and foraging within the Site, with the vast majority of the activity focused on the river corridor and fringing woodland. Given the type of activity recorded (i.e. foraging) the density band value for band B has been uplifted to 2.5.

2.8.7 In order to ensure no net loss of habitat 17.66 hectares are required, with "equivalent hectares" of 34.41 provided for in the design; when the "equivalent hectares of existing habitat on receptor" are accounted for, a net gain of 13.63 hectares is provided (77%). The habitats subject to loss / change (including those being subject to habitat restoration / creation) are shown within the HEP worksheet in **Appendix C**.

Regulation 9 report for lesser horseshoe bats

2.8.8 The SES response (January 2022) to the application provides the following statement with regards the Habitats Evaluation Procedure (HEP) and lesser horseshoe bat:

"Regulation 9 Report

The rebuttal letter does not address the requirement of a Regulation 9 Report under the Conservation of Habitats and Species Regulations 2017 (as amended) for lesser horseshoe bats. The application site supports a significant maternity colony of lesser horseshoe bats, consisting of an estimated 100 adult females which regularly use the house at Westdown Farm. A Regulation 9 Assessment concerning lesser horseshoe bats will therefore be required. The HEP calculation produced in respect of lesser horseshoe bats would inform the Regulation 9 process.

The HEP calculation provided within Wood's Westdown Quarry Habitats Evaluation Procedure Technical Note (Appendix 11E) has applied a Density Band Score which varies between the score in respect of Band A (3.0) and the score in respect of Band B (2.0). However, the Mendip District Council Technical Guidance on Development (version 2.1) which outlines in detail the Somerset HEP methodology, requires an assessment of the raw bat activity data to establish whether the species is present foraging and/or commuting. The presence of foraging activity (as defined by the Miller's Activity Index (2001)) results in the Density Band score being modified up by 0.5. Where only commuting activity is occurring the Density Band score remains the same. The same (and higher) Density Band score should also be applied across the entire development site.

In respect of this application, should foraging activity be identified, the Density Band score should be modified up to 3.5 and be applied across the entire development site for the purposes of the HEP calculation. Should only commuting activity be identified, the Density Band score of 3.0 should be applied across the entire development site."

2.8.9 The applicant has reviewed and updated the HEP for lesser horseshoe bat in accordance with the Mendip District Council Technical Guidance on Development (version 2.1) as set out in **Appendix C**. However, this update does not accord with the direction from SES as it appears to be contrary to the guidance. SES request that the density band score should be increased by a value of 0.5 across all habitats as lesser horseshoe bats are known to forage on site (e.g. see ES Figure 3.6). The applicant acknowledges that an uplift to some of the density band scores is necessary based on Mendip District Council Technical Guidance on Development (version 2.1) but do note this is not a requirement of the HEP methodology published on Somerset County Council's website. However, SES assert that the density band score should be 3.5 across the site; this is contrary to Mendip District Council Technical Guidance on Development (version 2.1) paragraph A5.29 that states that the 0.5 uplift should only be applied to density bands B and C. Accordingly, the uplift of 0.5 has been applied to all habitats in Band B, but not those in Band A (noting no habitats in

Band C are under consideration as the proposal lies entirely within 2.5 km of the maternity roost at Westdown Farm).

2.8.10 Further, SES state that the whole site should be considered to be within density band A although no explanation is given as to why. Table 1 of Mendip District Council Technical Guidance on Development (version 2.1) gives the density band distances as being (for A) within 600 m of a maternity roost, (for B) within 601 m and 2,500 m, and (for C) 2,501 m to 6,000 m. For other roosts habitat within 0 – 300 m is considered to be in Band B and from 301 m to 1,250 m within Band C. Figure 3.27 of the Bat Baseline Report (Appendix 11B of the Environmental Statement) shows that there is a single maternity roost within 600 m of the site boundary – therefore, all habitat within 600 m of this roost should be considered to be in Band A. All other habitat within the site boundary is between 601 m and 2,500 m and therefore (for the maternity roost) falls within density band B. Although there are other roosts within 1,250 m of the site boundary, they would all confer a density band of B or C to areas of the site. Therefore, the status provided by the maternity roost remains unchanged.

2.8.11 In total ~45 ha within the boundary lies within Band A, with a density band score of 3, and ~25 ha in Band B, with a density band score of 2.5. An additional 18.7 ha of arable land outside but adjacent to the site boundary has been added as the baseline for "Receptor Habitat". This has been provided a density band score of 2.5 (Band B), as the majority is over 600 m from the maternity roost. This additional area was not included in the HEP calculations alongside the application. The area was described in the ES but not included in the calculations as it was secured for 20 years only. However, following SES comments the area of habitat creation has been extended and its design enhanced (as illustrated in **Figure 2.1**), whilst its delivery would to be secured by way of a Section 106 agreement, as previously indicated in paragraph 2.2.6 of this response. As such, it has been included within the HEP calculation.

2.8.12 The number of habitat units lost to the mineral extraction activity at Westdown Quarry is 352.41 (across 61.35 ha), with the loss increasing to 395.57 (across 69.99 ha) when all areas that fall within the restoration plan are considered (i.e. includes some areas that will be targeted for habitat restoration despite not being subject to active quarry works). Fifteen different types of habitat (as described in Phase 1 habitat survey terms) would be lost to mineral extraction activity, with the largest land take being arable land (~34 ha). The remaining habitats lost to mineral extraction all occur at much lower extents with losses within 17 categories of habitat as identified in the Phase 1 habitat survey. The habitats subject to loss / change (including those being subject to habitat restoration/creation) are shown within the HEP worksheet in **Appendix C**.

2.8.13 The restoration plan includes the provision of a pallet of habitats that are already present in the general area and are characteristic of it. These include "quarry" which in the restoration plan is characteristic of the open mosaic habitat present across many areas of previously quarried land within the planning boundary. Calcareous grassland and broad-leaved woodland will also be created to complement the habitats within and adjacent to Asham Wood, with the main void becoming open water (see **Appendix C**). All additional habitat restored or created by the project is provided within the planning boundary, and the adjacent upfront off-site mitigation area (shown on **Figure 2.1**).

2.8.14 In order to ensure no net loss of habitat 21.98 hectares are required, with "equivalent hectares" of 27.73 provided; when the "equivalent hectares of existing habitat on receptor" are accounted for, a net gain of 2.37 hectares is provided (~11%).

Short-, medium- and long-term bat mitigation

2.8.15 Progressive restoration and provision of habitat has been carefully designed to take place alongside the phased loss of habitat, over a 20-year period, to ensure sufficient habitat is available at all stages of the proposed development to support all bat populations on site in the short-, medium- and long-term.

2.8.16 Details of the progressive restoration are summarised in Chapter 8 of this response and are illustrated on the phasing plans for the proposed development (ES Figures 3.3 to 3.7 which are replicated in the Planning Statement, Figures 3.1 to 3.5) as well as on the proposed restoration plan as illustrated on ES Figure 3.8, which is replicated in Planning Statement Figure 3.6. A detailed description of the proposed restoration and aftercare of the application site is set out in Section 3.3 of ES Chapter 3 and in Section 3.10 of the Planning Statement.

2.8.17 Due to the complexities of the proposed development, it is apparent that the submitted phasing plans and restoration masterplan have not sufficiently highlighted those short- and medium-term mitigation measures included in the progressive restoration of the proposed development. As such, **Figures 8.1** to **8.9** seek to illustrate the progressive restoration of Westdown Quarry and the incorporated short-, medium- and long-term mitigation measures.

2.8.18 There will be 'upfront' habitat creation during the first phase of works, i.e. Years 1-5, including the formation and planting of the perimeter screenbanks which would commence as soon as possible at the start of Phase 1. An 18 hectare area of upfront off-site habitat would be created in Year 1 of the proposed development on land within Hanson's ownership which lies immediately to the north of Westdown Quarry and to the south of the Bulls Green Link Road, or where feasible to do so, would be implemented as soon as the necessary planning approvals and legal agreements are in place. Further designs for the upfront off-site mitigation area are presented in **Figure 2.1**, whilst details of the proposed upfront additional planting along the site perimeter, including the transplanting of existing hedgerows are presented in **Figure 8.9**; habitats include species rich grazed grass pasture, native species-rich hedgerow and scrub which will provide optimal foraging habitat for bats (particularly for lesser and greater horseshoe populations) in the short- and medium-term.

2.8.19 The progressive restoration of Asham Wood Void (where no extraction is to take place) during Phases 1-4 (including final soil placement and planting) and the progressive restoration of benches, quarry backfill tips and lake margins as the quarry is expanded and deepened will create replacement habitats for the benefit of bats while habitats are lost from other areas of the application site; the earlier phases of habitat creation will begin maturing well before later phases of habitat removal.

2.8.20 Some habitats will not reach optimum development until around 30 years after creation; however they will still provide valuable foraging and commuting opportunities for bats whilst they mature. Many of the valuable habitats currently on the site are characterised by

a mosaic of ephemeral and short perennial vegetative growth. These early successional habitats will become available at each phase of the development and will not take 30 years to offer value to bat species. Once quarrying activity is complete, the restored area will provide a large area of suitable habitat for bat populations including a 16.59 hectare area of broadleaved woodland.

2.8.21 The progressive restoration proposals will ensure the habitat losses will not be detrimental to the maintenance of the populations of bat species at favourable conservation status in their natural range. Additionally, Hanson will be required to further demonstrate this in a subsequent European Protected Species Licence application to Natural England, which will be required for progressing the vegetation clearance to allow both quarrying operations at Westdown and the restoration of the Asham Quarry Void.

Roosting bats

2.8.22 Hanson/Wood does not agree that insufficient survey effort has been deployed to assess the presence of roosting bats in the Site Survey Area. A substantial amount of bat survey work has been undertaken to inform the proposed development, including to identify bat roosts. The scope of the numerous and detailed bat surveys which have been conducted was agreed with Natural England via Natural England's DAS on three occasions. The detailed bat baseline report is provided in ES Appendix 11B, paragraphs 3.1.6 to 3.1.8 of which provide details of all bat surveys carried out at the application site and which have informed the ES.

2.8.23 Due to the potential impacts of the proposed development, Advanced Licence Bat Survey Techniques (ALBST) were used (alongside a suite of other bat survey work) to provide a robust baseline and identify bat roosts. To ensure ALBST were robust the advice of the expert who helped develop the Bat Conservation Trust guidelines for ALBST (Daniel Whitby of AEWC Ltd), was subcontracted to conduct and advise on these surveys for the project.

2.8.24 As previously outlined the survey approach was agreed in consultation with Natural England and specially with regards to greater horseshoe bats (which SES challenge). The correspondence received from Natural England on 22/05/2020 responds: *"Natural England considers that you have gathered enough evidence to inform an assessment of the impacts likely to arise from the site proposals and to identify suitable avoidance and mitigation measures. The combination of survey methods used provides a good basis for understanding use of the site by GHB"*.

2.8.25 It is considered the survey effort undertaken with regards to identifying the location and status of bat roosts within the Site Survey Area has allowed for a robust impact assessment as detailed in the submitted ES and provides sufficient information for the LPA to determine the application in line with their responsibilities with regards to bats and biodiversity (as listed in the SES rebuttal, January 2022).

2.8.26 As outlined in the rebuttal to SES (**Table 2.2**) employing traditional survey techniques such as roost inspections and emergence surveys on all potential crevice roosts across the thousands of trees and hundreds of metres of exposed quarry face (including over winter) would be completely unfeasible. It is acknowledged that pre-construction checks will be undertaken at features that could be used by roosting bats (ES Table 11.10); due to the

physical and safety challenges of inspecting the quarry faces, the approach and methods used to conduct these inspections would be agreed with Natural England post consent through the licencing process.

2.8.27 Given the scale of bat survey work already conducted (and that survey approaches were agreed with Natural England and informed by industry experts) additional survey effort with regards to bat roosts (or the status of bats on site in general) to support the planning submission is not considered justified, and any additional information would provide only a snapshot in time and would not necessarily represent the status of the small crevice roosts at the time of works commencing. It is acknowledged that further bat survey work and additional detail with regards to mitigation, compensation (and monitoring) for potential roost losses arising from works affecting quarry faces, and trees would be required prior to works commencing; this would be delivered in liaison with Natural England via the licensing process.

Westdown Quarry Regulation 25 Submission

Figure 2.1
Upfront off-site mitigation area

June 2022

wood.

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3. Highways

3.1 Regulation 25 additional information request

3.1.1 In their letter SCC state:

"It is noted that the proposal is for a maximum 2 million tonnes of stone to be exported by HGV from Westdown quarry, which will be offset by a proposed reduction of 2 million tonnes from the Applicant's nearby Whatley Quarry. This would lead to no net increase in HGV numbers within the local highway network. In order to ensure that this matter is controlled effectively the landowners and operators will need to secure a S106 obligation to cover both sites. Please can you instruct your legal team to prepare draft heads of terms for such a document or, as a minimum, confirm that such an approach is acceptable.

Further, the HA wishes to see some additional clarity regarding HGV movements associated with Westdown and Whatley Quarries; please can this be provided to satisfy its concerns."

3.2 Draft heads of terms

3.2.1 Hanson is agreed that a S106 obligation to cover both Westdown and Whatley quarries needs to be secured to ensure there is no net increase in HGV numbers within the local highway network. Hanson have duly instructed their legal team to prepare draft heads of terms for such a document and these are set out in **Appendix D**.

3.3 HGV movements clarification

3.3.1 In their response, the Highways Authority (HA) state:

"Although the Highway Authority does not object to the principle of the four applications, there are concerns that the supporting information that relates to the Transport Assessments. There are some discrepancies within the document that means that it is unclear as to the levels of vehicle movements when looking at the HGV movements and the Rail network movements. Throughout the TA there is conflicting information that states one quarry would transport 4mtpa through HGV movements and the other would be rail, however the TA contradicts itself to say that there will be an equal split between HGV and Rail. The applicant would need to clarify this detail for the avoidance of doubt and show the exact figures that would be transported. Details of how the movements of how the vehicle movements would also need to be included to ensure that the movements do not contradict any existing conditions relating to routing, however, should any subsequent information provided be sufficient that the Highway Authority does not raise an objection this could be conditioned or secured within a sufficient legal agreement."

3.3.2 A response to the above HA's comments (October 2021) on the Westdown planning applications was submitted to SCC in October 2021. That response has been reviewed and updated as required and is reiterated below.

Material transported by road

3.3.3 The existing planning permission for Whatley Quarry (reference 109/22/002, July 1996) states at Condition 30 that no more than 4 million tonnes of the total output from the site in any one calendar year shall be transported by road. The resumption of working at Westdown Quarry would be to complement existing operations at Whatley Quarry. Whatley and Westdown quarries combined would operate within the existing permitted 4 million tonnes per annum (mtpa) limit. Therefore, a maximum 2mtpa would be transported by road from Whatley and a maximum 2mtpa would be transported by road from Westdown. The calculation of development traffic (combined on the local road network) is based on the worst-case scenario of 4mtpa transported by road (i.e. Whatley Quarry 2mtpa + Westdown Quarry 2mtpa). It is recognised within both the submitted stand-alone Transport Assessment and ES Chapter 12 (Traffic and Transport) that Whatley Quarry has to date operated well within its permitted 4mtpa output by road limit.

3.3.4 Only mineral extracted at Whatley Quarry will be transported by rail from the dedicated rail head at Whatley Quarry. All mineral extracted at Westdown Quarry will be transported by road.

HGV movements

3.3.5 The distribution of the HGVs from Westdown Quarry is based on the current Whatley Quarry delivery locations. It is considered that HGVs from Westdown Quarry will also use the same routes to deliver material and there will be no change in the current routes of HGVs from Whatley Quarry.

3.3.6 Traffic turning into and onto the Bulls Green Link Road would come from a route that is already used by the permitted Whatley Quarry traffic. Only an approximate 1km stretch along the Bulls Green Link Road represents a new element of routes for HGVs. According to Appendix 1 (The Somerset Freight Map) of Somerset Freight Strategy Transport Policies 2021, the Bulls Green Link Road is identified as part of the Local Freight Routes. Therefore, it is concluded that the 1 km stretch of the Bulls Green Link Road is suitable for HGV movements and as such, a majority of the development will utilise a designated HGV route as preferred in the Council's scoping opinion (July 2020).

4. Hydrology and hydrogeology

4.1 Regulation 25 additional information request

4.1.1 In their letter SCC state:

"The Local Lead Flood Authority and the Environment Agency have responded to these applications and the LLFA objects to the proposal due to the use of circa 15-year old JFLOW mapping with no consideration of the effects of climate change. The LLFA considers that, 'given the scale and nature of the application along with the high potential for any changes in earthworks to affect flood risk extents, the LLFA would expect this development to be supported by detailed hydraulic modelling. This should provide an updated assessment of the baseline flood risk including climate change effects, along with demonstration that the proposed restoration works will not exacerbate flood risk.' This needs to be addressed in either a revised FRA or via an addendum to the original. The EA also raises concerns regarding the groundwater modelling and requests similar improvements be made to the modelling and this be submitted for assessment.

With regard to flood attenuation, due to the potential large volumes of water involved, further information is required demonstrating where this attenuation will be provided and the resilience of the system should be considered as to whether multiple smaller attenuation lagoons would be better.

Fish Legal has objected to the proposal on grounds that the nearby Chantry Pond, which is a commercial course fishing site open to the public, may suffer unacceptable impacts from increased turbidity and additional information to demonstrate that this will not be the case should be submitted.

The above additional information is necessary to demonstrate that the developments can take place without causing unacceptable impacts on groundwater, surface waters and flood risk.

Previously submitted clarification information

4.1.2 A response to the Local Lead Flood Authority's (LLFA) comments (July 2021) on the Westdown planning applications was submitted to SCC in September 2021.

4.1.3 In June 2021, Wood provided further information on the development and calibration of the interim model used to prepare the scenarios described in the appendices to the Westdown ES[14], in response to a request from the Environment Agency (EA) to help inform their response to the Council's consultation on the Westdown Quarry planning applications. This information was also submitted to then SCC case officer, Kirk Denton.

4.1.4 A response to the EA's comments (August 2021) on the Westdown planning applications was submitted to SCC in September 2021 and a Teams meeting with the EA was held on 1st October 2021 at which Wood provided further technical clarifications of the water environment assessment as outlined in ES Chapter 10, including the groundwater

[14] Wood (June 2021) *Technical Note: Historical calibration summary of the interim groundwater model of Westdown Quarry* (ref. 00419N7447i1_Westdown_Addednum_Final)

modelling which has been undertaken. A follow up Teams meeting was held on 13th October 2021 to specifically discuss the receptors identified and included in the Westdown water environment assessment. A further response to the EA's comments on the Westdown planning applications was submitted to the then SCC case officer, Philip Millard, in October 2021.

4.1.5 In November 2021, the EA proposed six conditions to protect water resources for Westdown Quarry which were shared with the applicant by the then SCC case officer, Philip Millard. A high-level response to the EA's proposed conditions was emailed to the SCC case officer on 24th November 2021.

4.1.6 Where appropriate the clarification information previously submitted has been reviewed and updated as required in the following sections which seek to address the objections by the LLFA and the EA.

4.2 Response to LLFA

Fluvial flooding

4.2.1 The LFFA in their response comment (pages 2 & 3):

"The site is bisected by the Fordbury Water, which is an Ordinary Watercourse, becoming a Main River to the north of the site. Nonetheless, this watercourse has Flood Zones associated with it and therefore parts of the site are located within Flood Zone 2 and 3 typically in close proximity to the watercourse.

In terms of site development it is recognised that much of the proposed extraction is located within Flood Zone 1 to the east of the Fordbury Water, however the permissions requested also include elements of restoration of Asham Wood where mining is understood to have last been undertaken in the 1980s. This is shown in close proximity to the Flood Zone 2/3 extents and it is understood from the correspondence within the FRA, these Flood Zones are delineated using the Environment Agency's 2006 national JFLOW mapping.

This modelling is circa 15 years old with no consideration of climate change and as such is considered insufficient as the basis for this flood risk assessment. Given the scale and nature of the application along with the high potential for any changes in earthworks to affect flood risk extents, the LLFA would expect this development to be supported by detailed hydraulic modelling. This should provide an updated assessment of the baseline flood risk including climate change effects, along with demonstration that the proposed restoration works will not exacerbate flood risk."

Fluvial flooding

4.2.2 The applicant acknowledges the limitations of the existing Environment Agency JFLOW modelling upon which the fluvial assessment has been based but believe that for the purpose of the planning submission, the level of understanding gives sufficient confidence to allow the Review of Old Minerals Permission (ROMP) application to be determined, as explained further below.

4.2.3 The applicant also acknowledges the LLFA's reservations regarding the accuracy of the modelled flood extents used, a matter which was already being considered by Hanson with respect to whether site-specific hydraulic modelling could 'win' more land available for restoration (if the new modelling confirmed that the flood extent was reduced compared to the Flood Zone 2 extent, which was used as a proxy for the 100 year plus climate change extent in the FRA). For this reason, we believe dealing with this matter through a planning condition is an appropriate course of action in this case and is justifiable for a number of reasons. We would hope this provides the LLFA with the confidence to remove any objection to the application.

4.2.4 Our confidence that a solution can be achieved within the footprint of the application boundary relates to:

- the availability of two datasets at the site which have modelled the flood extent of Fordbury Water (discussed further below);
- the relatively minimal allowance for climate change (20%) associated with the proposed development being classified as 'water compatible' development with respect to flood risk vulnerability, as set out in paragraph 3.3.4 of the FRA; and
- the general lack of potential off-site receptors in the immediate vicinity of the site to be impacted by any minor changes in floodplain extent (see paragraph 3.3.2 and Figure 2.3 of the FRA).

4.2.5 Where hydraulic modelling of an Ordinary Watercourse is not available, the Environment Agency's surface water flood map, which itself is based on more-recent modelling, can provide a good indication of the fluvial flood risk. This flood extent is presented in Figure 3.1 of the FRA. Figure 3.1 shows a smaller flood extent than that associated with the JFLOW modelling (Figure 2.4 of the FRA), which itself is generally considered to provide a conservative flood extents. The worst case of the two extents was used to inform the fluvial flood risk assessment and thus inform where to avoid placement of restoration material during the preparation of the application proposals. There is always the risk with new modelling that a greater flood extent could result, but we are confident that, more than likely, whilst the shape of the flood extent might change, the overall footprint would largely remain similar/unchanged, meaning that achievable (and relatively minor) changes to the restoration proposals would be all that would be necessary to avoid any impacts on floodplain storage. Further to this, the lack of receptors nearby means that minor impacts on flood extents are unlikely to adversely impact any actual receptors, meaning no change in actual risk. Indeed, minor changes to the restoration proposals are anticipated subsequent to the application determination, consistent with suggested Planning Conditions 4f and 5 (Proposed Schedule of Conditions is included in Appendix B of the Planning Statement).

4.2.6 We therefore propose that hydraulic modelling of the Fordbury Water is included as a Condition of the Planning Application, rather than a matter to be resolved ahead of determination. Owing to the importance of the matter, we would suggest that the condition be included as a Matters Requiring Approval prior to Commencement of Phase 1, rather than commencement of the later restoration phase. It could be added as item v) of the existing suggested Condition 3(g) (Proposed Schedule of Conditions is

included in Appendix B of the Planning Statement), which is presented below for ease, with the suggested amendments in **bold**.

(g) A Water Monitoring and Mitigation Strategy is agreed, which should include:

i. Details of the sizing, location and maintenance of the settlement lagoons required to collect all surface water runoff;

ii. Details of the drainage arrangements within the site's compound area;

iii. Details of the groundwater monitoring borehole network;

iv. An appropriate method and timescale for the submission of on-going groundwater monitoring data.

v. Hydraulic modelling of the Fordbury Water Ordinary Watercourse, and any associated refinement of the restoration proposals as required.

*Reason: To ensure the development is carried out in a manner which protects the water environment **and manages flood risk**. (Adopted Somerset Minerals Local Plan (February 2015) Policies DM4 Water Resources and Flood Risk and DM5 Mineral Extraction below the Water Table and Parts 14, 15 and 17 of the National Planning Policy Framework).*

Hydraulic modelling update

4.2.7 Whilst it is proposed that the hydraulic modelling is undertaken as a planning condition as set out above, in recognition of the importance of this work, Hanson have already instructed Wood to undertake the hydraulic flood modelling at Westdown. Wood will liaise with the LLFA to inform this work.

Surface water (and reservoir)

4.2.8 The LLFA in their response comment (page 3):

"A high-level assessment of surface water runoff and attenuation has been provided to outline how runoff from the quarry will be managed. It is understood attenuation will utilise the base of the quarry itself during extreme events with water pumped up into a settlement lagoon for further pumping into the Fordbury Water. Greenfield discharge rates have been calculated and these are recognised as low given the high potential for infiltration.

Indicative volumes and discharge rates are provided and the FRA makes reference to Appendix D however as noted above, these plans have not been included. However, much of the information indicates significant volumes which would ordinarily be considered as a reservoir as they are over 25,000m3 (or 10,000m3 as per the Flood & Water Management Act 2010 albeit this section has not yet been enacted). As such further information is required demonstrating where this attenuation will be provided and the resilience of the system should be considered as to whether multiple smaller attenuation lagoons would be better."

4.2.9 Wood acknowledges that the calculated attenuation volumes in Tables 4.1 and 4.2 of the FRA are in excess of both the (as yet unenacted) 10,000m^3 as per the Flood & Water

Management Act (FWMA) 2010, and the 25,000m^3 as per the Reservoirs Act 1975. However, the requirements relating to reservoirs apply to the volume of water that is impounded by artificially created embankment(s). In this case, it is anticipated that the vast majority of the attenuation volumes will be provided in the base of the quarry, i.e. not impounded by an artificial embankment, with significantly smaller volumes at various smaller locations at the surface (some of which may need to be created using raised embankments). The various locations are identified in the Site Phasing and Restoration Plans, which should have been included in Appendix D of the FRA report (as stated above, apologies for this omission; the final plans were included in both the Planning Statement and as part of the ES). These plans provide the further information requested demonstrating the multiple smaller locations where the attenuation would also be provided (along with the base of the quarry).

4.2.10 At this stage (for the planning submission), we sought to confirm with the quarry operator that sufficient space would be available to ensure a sustainable drainage solution could be delivered, without getting into the details (which would not have been possible given the level of detail available for the development itself at this stage). This is the reason why we have not yet indicated how the total volume will be split across the site – we have been assured that sufficient space is available within the wider quarry boundary footprint (see para 4.1.3 of the FRA) and that this can be dealt with at the detailed design stage.

4.2.11 It is indeed a good point that impounded volumes should be considered as part of design and indeed minimised wherever possible. This is consistent with the proposed approach to provide the majority of the attenuation in the base of the quarry, thus avoiding the risk of unnecessarily large, raised impoundments of water. We agree that it is a point worth adding to Table 4.3 of the FRA (Considerations for Detailed Drainage Design), i.e. a matter to be considered at detailed design stage, which (as acknowledged in a number of locations of the FRA), *"is to be developed subsequent to approval of the planning application"*. The question of design of impounding embankments (and whether the Noise and blasting requirements of the Reservoirs Act and or the FWMA would apply at any of the individual attenuation and/or settlement locations) would be considered at that stage (detailed design).

4.3 Response to the EA

Groundwater modelling

4.3.1 It is evident from the discussions that took place during the meetings with the EA in October 2021 that they maintain their objection to the proposed recommencement of mineral extraction at Westdown Quarry and in particular would like to see further information to address their concerns regarding the modelling used to inform the Westdown ES water assessment. Nevertheless, Hanson wish to propose a potential way forward to facilitate the determination of the four Westdown Quarry planning applications whilst also seeking to address the Agency's concerns. As such, it is proposed to include an additional condition in the proposed schedule of conditions to not work below the water table until the submission of further additional information, including appropriate modelling work. This suggested approach is similar to that adopted at other operational

quarries in the local area, notably Halecombe Quarry, as well as quarries elsewhere in England.

4.3.2 The suggested wording for the proposed condition reads:

"There shall be no dewatering of the excavation until such time as an agreed scheme of groundwater monitoring has been carried out (over a minimum period of 12 months) and a Groundwater Monitoring and Mitigation Strategy (GMMS) and Monitoring Report has been submitted to and approved by the Mineral Planning Authority. As a minimum the GMMS should include:

i. Details of the groundwater monitoring borehole network.

ii. Details of historic and on-going groundwater level and quality monitoring – including frequency, method and duration.

iii. An appropriate method and timescale for the submission of on-going groundwater monitoring data.

iv. water resource mitigation strategy (with associated measures and timescales).

The GMMS should be based upon the following information contained within the Monitoring Report:

i. A summary of all available monitoring data highlighting and interpreting any observed changes to the site's groundwater regime (quality and level).

ii. Details of on-site water use and management practices.

Reason: Reason: To prevent the pollution of the water environment. (Somerset Minerals Local Plan (February 2015) Policy DM4 Water Resources and Flood Risk and Policy DM5 Mineral extraction below the water table, and Parts 14 and 17 of the National Planning Policy Framework)."

4.3.3 It is proposed the above new condition is inserted into the proposed Schedule of Conditions (Appendix B of the Planning Statement) under a new section headed 'Matters Requiring Subsequent Approval Relating to Groundwater' to be inserted after the section headed 'Matters Requiring Approval prior to Commencement of Subsequent Phases (Phases 2 Onwards)' and before the section headed 'Completion'.

EA proposed conditions to protect water resources for Westdown Quarry

4.3.4 In November 2021, the EA proposed six conditions for hydrology which were shared with the applicant by the then SCC case officer Philip Millard in an email dated 16th November 2021. The EA's proposed conditions are outlined below:

"Proposed Conditions to Protect Water Resources for Westdown Quarry

1. *No excavation of the footprint of the existing quarry void or deepening below 150 m AOD until such a time that:*

East Mendips Groundwater Model, has been further refined and

- *Is deemed fit for purpose by a Technical Working Group[1] to forecast the impact of the full proposed extension of Westdown Quarry, (planning application SCC/3703/2020/PA) in combination with full planned working of all neighbouring quarries and Bristol Waters abstractions.*

East Mendip Groundwater Model and other available information and data has been used to the satisfaction of the Technical Working Group (TWG), to determine the in combination impacts[4] of each phase of operation in extension to Westdown Quarry and determine:

a) the receptors[2] that may be impacted[3] by each phase of operation proposed in extension of Westdown Quarry

b) the drawdown or reduction in flow that will result to each receptor as a result of future operations at Westdown Quarry.

- Interpretative report of these impacts has been prepared and adverse impacts identified and proposed mitigation proposed

- Monitoring[5] and mitigation scheme (including future triggers) has been implemented to the satisfaction (written agreement of) of Somerset County Council (SCC) in consultation with the Environment Agency (EA).

2. Within 12 months of the planning permission having been granted that Operator of Westdown Quarry shall review the extent and suitability of the existing environmental monitoring scheme. Such a review will include a meeting between the Operator, EA and SSC. At this meeting, agreed monitoring locations, trigger levels and levels for action for Westdown Quarry will be agreed. Thereafter, an annual submission of an Environmental Monitoring Statement will be made to the Environment Agency (EA) and Somerset County Council (SCC). This to include for the annual monitoring return of quarry dewatering rates, rainfall, groundwater levels, surface water flows and water quality; update for the quarry development and future plans and interpretive and conceptual hydrogeological reporting. As part of this reporting, the observed monitoring data will to be compared with the model forecast data and results. Recommendations will then be made to the EA as to if there needs to be changes to the existing monitoring network or a re-assessment of the impacts through further modelling. Any further modelling or impacts assessment(s) will also need to be to the satisfaction of the TWG and SCC.

3. Prior to any development at Westdown Quarry, an investigation will be completed to assess the impact of excavating to laterally enlarge the footprint of the existing void of the quarry and if needed dewatering on all water resources as identified under the Westdown Quarry Scheme and any subsequent update thereof. An agreed mitigation scheme for any impacts identified for water resources must be in place and along with a proof of concept to show that the mitigation scheme is achievable. There is to be no extraction to laterally enlarge the footprint of the existing void of the quarry until the mitigation scheme(s) have been approved by the EA and SSC and implemented as required.

The findings of the investigation shall be submitted to SSC in consultation with the EA at least 24 months prior to excavating to laterally enlarge the footprint of the existing void of the quarry. If in the opinion of SSC such an investigation fails to demonstrate there has not been or will be, any adverse effect on those water resources receptors as identified and scoped into the Westdown ES water assessment by the quarrying at Westdown Quarry

and if remedial measures would not mitigate any adverse effect, SSC shall give notice to the Operator of this opinion with 6 months of the receipt of the investigation findings.

Following the receipt of such notice no further excavation of the quarry will be permitted.

4. *No working below 150 m AOD until: At least 24 months prior to extraction of limestone below the current level of the quarry void (150 m AOD), apart from the provision of a quarry drainage sump, an investigation will be completed to assess the impact of excavating and if needed dewatering to the next level on all water resources as identified under the Westdown Quarry Scheme and any subsequent update thereof. The investigation will also include recommendations for any changes to the existing monitoring network or a re-assessment of the impacts through further modelling. Any further modelling or impacts assessment(s) will also need to be to the satisfaction of the TWG and SCC. No extraction will be allowed to enlarge or deepen the footprint of the wider quarry below (150 m AOD) (apart from a quarry drainage sump) until the mitigation scheme(s) have been approved by the EA and SSC and implemented as required.*

   The findings of the investigation shall be submitted to SSC in consultation with the EA at least 24 months prior to excavating to laterally enlarge the footprint of the existing void of the quarry. If in the opinion of SSC such an investigation fails to demonstrate there has not been or will be, any adverse effect on those water resources receptors as identified and scoped into the Westdown ES water assessment by the quarrying at Westdown Quarry and if remedial measures would not mitigate any adverse effect, SSC shall give notice to the Operator of this opinion with 6 months of the receipt of the investigation findings.

   Following the receipt of such notice no further excavation of the quarry will be permitted below 150 m AOD.

5. *No working below 135 m AOD; 120 m AOD; 105 m AOD and 90 m AOD until: At least 24 months prior to extraction of limestone below bench level (135 m AOD; 120 m AOD; 105 m AOD and 90 m AOD), apart from the provision of a quarry drainage sump, an investigation will be completed to assess the impact of excavating and if needed dewatering to the next level on all water resources as identified under the Westdown Quarry and any subsequent update thereof. The investigation will also include recommendations for any changes to the existing monitoring network or a re-assessment of the impacts through further modelling. Any further modelling or impacts assessment(s) will also need to be to the satisfaction of the TWG and SCC. No extraction will be allowed to enlarge or deepen the footprint of the wider quarry below the second bench level (135 m AOD; 120 m AOD; 105 m AOD and 90 m AOD) (apart from a quarry drainage sump) until the mitigation scheme(s) have been approved by the EA and SSC and implemented as required.*

   The findings of the investigation shall be submitted to SSC in consultation with the EA at least 24 months prior to excavating to laterally enlarge the footprint of the existing void of the quarry. If in the opinion of SSC such an investigation fails to demonstrate there has not been or will be, any adverse effect on those water resources receptors as identified and scoped into the Westdown ES water assessment by the quarrying at Westdown Quarry and if remedial measures would not mitigate any adverse effect, SSC shall give notice to the Operator of this opinion with 6 months of the receipt of the investigation findings.

Following the receipt of such notice no further excavation of the quarry will be permitted below 135 m AOD; 120 m AOD; 105 m AOD and 90 m AOD.

6. *A further review of environmental monitoring conditions, quarry dewatering rates, assessment of the impacts through further modelling (to the satisfaction of the TWG and SCC) and of the mitigation conditions and any scheme(s) will be undertaken every 5 years or at least 24 months prior to the extraction of limestone below the next bench drop, whichever is the earlier.*

Definitions:

[1] A Technical Working Group (TWG): for the East Mendips Groundwater Model to be formed; Terms of Reference to be agreed and with the following minimum membership (Somerset County Council, Environment Agency, Hanson (Developer), Hanson's Hydrogeological Consultant, Quarry Products Association, Model External Reviewer, Bristol water Company).

[2] Receptors: Identified and scoped as part of the Westdown Environmental Water Assessment and to identify those receptors where there is considered to be any uncertainty that may need to be scoped in for further assessment.

[3] Impacted: Greater than x cm drawdown or x %age impact on Q95%ile flows* (*tbc by TWG and SSC).*

[4] In combination; The operation of Westdown quarry when other permitted quarry developments across Mendip have been developed/worked to their full extent permitted by planning (depth and aerial extent) together with operation of licenced groundwater abstractions operating at full licence quantity under drought scenario.

*[5] Monitoring: surface and groundwater monitoring sites that will be monitored at an agreed frequency and reported annually to the SSC and EA, for the purpose of identifying any impacts resulting from operations at Westdown Quarry ***and confirming if modelling predictions are accurate.*

[6] Annual interpretative report; review will include submission of report to EA and SSC, (followed where requested by SSC and EA a meeting with the Operator). At this meeting, agreed monitoring locations, trigger levels and levels for action for Westdown Quarry will be agreed. Thereafter, an annual submission of an Environmental Monitoring Statement will be made to the Environment Agency (EA) and Somerset County Council (SCC). This to include for the annual monitoring return of quarry dewatering rates, rainfall, groundwater levels, surface water flows and water quality; update for the quarry development and future plans and interpretive and conceptual hydrogeological reporting.

4.3.5 The applicant provided a high-level response to the EA's proposed conditions to the SCC case officer in an email dated 24th November 2021. This response has been reviewed and updated as required in the subsequent paragraphs.

4.3.6 As outlined in paragraph 4.3.2 above, Hanson have proposed an additional condition to not work below the water table subject to the submission of further information in response to the EA's concerns regarding the modelling used to information the Westdown ES water assessment, specifically in relation to groundwater (i.e. the East Mendips Groundwater Model). It is important therefore that any proposed conditions at Westdown, not only seek to differentiate between surface water and groundwater resources, but also

do not prejudice bringing forward the extraction of mineral above the water table. As worded, it is considered that the EA's draft conditions are unnecessarily complex and fail to distinguish between the protection of ground and surface waters. Specifically, it is considered that much of the detail of the EA's drafted conditions would be incorporated within any Ground and Surface Water Monitoring and Mitigation Strategy as referred to in the proposed condition set out in paragraph 4.3.2 above.

4.3.7 It is anticipated that any such Ground and Surface Water Monitoring and Mitigation Strategy should include for an environmental monitoring scheme and a regular review thereof which would need to be agreed with both SCC as the relevant LPA and the EA as set out in the EAs' draft conditions (2) and (6). However, the reference in the EA's condition (2) to *"As part of this reporting, the observed monitoring data will to be compared with the model forecast data and results. Recommendations will then be made to the EA as to if there needs to be changes to the existing monitoring network or a re-assessment of the impacts through further modelling. Any further modelling or impacts assessment(s) will also need to be to the satisfaction of the TWG and SCC"* is considered unnecessarily detailed for the inclusion in a planning condition and would be better detailed in the Ground and Surface Water Monitoring and Mitigation Strategy.

4.3.8 With regards to the EA's draft condition (1), whilst the principle of the provisions of this condition are not unreasonable, it is considered that this condition fails to meet the six planning condition tests as set out in NPPF paragraph 55 and the NPPG (Paragraph: 003 Reference ID: 21a-003-20190723)[15] and Circular 11/95[16]. **Table 4.1** below provides further commentary on this.

Table 4.1 Planning conditions tests EA draft condition (1)

Planning condition tests	Commentary
1. Necessary	In applying this test, the following question must be asked: Could the proposed development be consented without the draft condition? If the answer is yes, then the condition is deemed not necessary. In this regard, it is considered that the EA's draft condition (1) is not necessary as the groundwater model will be referenced in and used to inform the Ground and Surface Water Monitoring and Mitigation Strategy as referenced in the proposed condition in paragraph 4.3.2. Given the developments made to the groundwater model since the submission of the consolidating Westdown planning submission and its supporting information, notably the EIA water assessment, it may be appropriate that an updated water assessment is required to inform the Ground and Surface Water Monitoring and Mitigation Strategy, not least to agree monitoring locations, trigger levels and levels for action as set out in the EA's draft condition (2).

[15] https://www.gov.uk/guidance/use-of-planning-conditions
[16] https://www.gov.uk/government/publications/the-use-of-conditions-in-planning-permissions-circular-11-1995

Planning condition tests	Commentary
2. Relevant to planning	The EA's draft condition (1) is not considered relevant to planning. As set out above, the groundwater model will be used to inform the Ground and Surface Water Monitoring and Mitigation Strategy (which is the subject of a separate planning condition) and thus does not need to be referenced in a separate planning condition.
3. Relevant to the development to be permitted	The groundwater model is only relevant to the proposed recommencement of mineral extraction at Westdown Quarry, in so far as the model will inform the Ground and Surface Water Monitoring and Mitigation Strategy, the preparation of which is subject to a separate planning condition. As such, it is considered that the EA's draft condition (1) fails this test.
4. Enforceable	It is considered that the EA's draft condition (1) is not enforceable, and thus fails this test. As drafted, the condition is dependent on the consent or authorisation of a third party, i.e. the Technical Working Group. This is a **non-statutory** group which has no statutory remit for the implementation and/monitoring of planning consents or any official remit to the Local Planning Authority..
5. Precise	With regards to the test of precision, Circular 11/95 paragraph 30 states *"The framing of conditions require care, not least to ensure that a condition is enforceable."* Use of phrases such as *"has been further refined"* and *"is deemed fit for purpose by a Technical Working Group"* are both imprecise and unmeasurable. As such, it is considered that the condition is not enforceable and thus fails this test.
6. Reasonable in all other respects	Circular 11/95 paragraph 38 states, *"it is unreasonable to impose a condition worded in a positive form which developers would be unable to comply with themselves, or which they could comply with only with the consent or authorisation of a third party …"*. As worded, the EA's draft condition (1) states *'… East Mendip Groundwater Model and other available information and data has been used to the satisfaction of the Technical Working Group'* and is thus reliant on the consent or authorisation of a third party. As such, it is considered that this condition is unreasonable.

4.3.9 Noting the points set out in the table above, it is considered that draft EA condition (1) should not be included in any schedule of planning conditions. Whilst recognising the importance of the groundwater model being developed, it is considered however that all reference in the conditions to the groundwater model is inappropriate in that this model will be used to inform the Ground and Surface Water Monitoring and Mitigation Strategy that is to be prepared for Westdown Quarry.

4.3.10 The EA's draft condition (3) states there being no extraction to laterally enlarge the footprint of the existing void of the quarry until mitigation scheme(s) have been approved by the EA and SSC and implemented as required. Whilst it would be acceptable to have to prepare and agree a mitigation plan (as set out in paragraph 4.3.2 above) to manage any surface waters encountered prior to any lateral extension of the quarry footprint (within the confines of the overall redline boundary), it is not considered necessary to have to agree any groundwater mitigation strategy where excavations remain above a specific

m AOD, i.e. above the water table. As such, it is requested that reference is made in any conditions to the need to agree a surface water mitigation strategy prior to the re-commencement of quarrying at Westdown; but in terms of agreeing a mitigation strategy in relation to groundwater, that this is drafted and agreed prior to any working below 150m AOD (or below the water table).

4.3.11 Finally, as set out in the NPPF (paragraph 54), NPPG and Circular 11/95, any planning conditions need to be enforceable by the relevant local planning authority, in this case Somerset County Council (SCC) as the mineral planning authority. As such, all reference to the Technical Working Group (TWG) should be removed from the proposed conditions; SCC have no control over this group. The EA is the relevant statutory body and as such it is considered that only they should be referenced in the conditions.

4.4 Response to Fish Legal – Chantry Pond

4.4.1 The potential effects on Chantry Pond have been assessed as part of the water environment assessment detailed in ES Chapter 10 (Section 10.10). Chantry Pond has been scoped into the assessment as a water dependent non-statutory conservation site due to its status as a Local Wildlife Site (LWS) and a waterbody. The assessment concludes that there will be no significant adverse effects on Chantry Pond (paragraphs 10.10.21 – 10.10.23 and Table 10.23).

5. Noise and blasting

5.1 Regulation 25 additional information request

5.1.1 In their letter SCC state:

"The quarry is reasonably well distanced from local sensitive receptors and the Council's Acoustic Consultant raises no objection in principle to the submissions, subject to some minor amendments to the proposed conditions. Notwithstanding this, on page 16 of the response six matters of clarity are raised and I should be grateful if a response to these matters is submitted so that a full assessment can be undertaken."

5.1.2 In their response, the Council's Acoustic Consultant seeks clarification on the following six matters:

i. *"The location and residential ownership status of Tonigre Cottage, at 380m southeast of the site boundary, might suggest it as being a primary noise and vibration sensitive location and the reason it has not been identified or described in noise or vibration reports is not understood.*

ii. *The statements inferring delayed start of 07:00 to be applied to mineral processing appear conflicting in PS 4.3.6 and may need to be clarified if they are being made in respect to the different aspects of mineral processing (i.e. primary face operations and secondary/tertiary crushing and screening).*

iii. *Specific consideration of noise from the drill rig during more exposed operation might indicate it to be a primary source of noise requiring effective mitigation. The noise report statement in Table 7.18 for 07:00 start time, or 06:00 when excavated to 5m, does not appear to be reflected in the wording of the applicant's condition 8 that includes drilling from 06:00. The intensions for operation of, and noise arising from the drill rig are in my opinion ambiguous and need to be clarified.*

iv. *If drilling represents a primary noise source it would seem appropriate to confirm both the assumptions made regarding the sound power level of plant to be used, and the assumption of 50% operational noise within an hour of drilling.*

v. *It is unclear why there is a large disparity between the 302 HGV expected per weekday by Table 5.2 of the TR for 2mtpa output, and the 192 HGV derived from double the traffic implied from 1mtpa growth, as obtained by comparing the difference between Tables 3.4 and 3.5.*

vi. *While the movements of HGV from Whatley may be covered by the present consent, it may be helpful to clarify the associated changes to evening and night-time movements from Whatley Quarry brought about by this development."*

5.2 Clarifications

5.2.1 **Table 5.1** details the applicant's response to the clarifications outlined in the Council's Acoustic Consultant's response.

Table 5.1 Clarifications in response to SCC Acoustic Consultant

Issue for clarifications	Applicant's response
The location and residential ownership status of Tonigre Cottage, at 380m southeast of the site boundary, might suggest it as being a primary noise and vibration sensitive location and the reason it has not been identified or described in noise or vibration reports is not understood.	Tonigre Cottage would be considered a noise sensitive receptor (NSR), however, closer NSRs such as those at Leighton and Broadgrove House have been assessed. It is considered that the noise impact will be at a lower magnitude at Tonigre Cottage than the other receptors, due to the larger distance from the site.
The statements inferring delayed start of 07:00 to be applied to mineral processing appear conflicting in PS 4.3.6 and may need to be clarified if they are being made in respect to the different aspects of mineral processing (i.e. primary face operations and secondary/tertiary crushing and screening).	The 07:00 start is for all mineral processing operations (i.e. primary face operations and secondary/tertiary crushing and screening). This allows for quieter operations to start within night-time hour of 06:00 – 07:00 in preparation of the main processing activities on site.
Specific consideration of noise from the drill rig during more exposed operation might indicate it to be a primary source of noise requiring effective mitigation. The noise report statement in Table 7.18 for 07:00 start time, or 06:00 when excavated to 5m, does not appear to be reflected in the wording of the applicant's condition 8 that includes drilling from 06:00. The intensions for operation of, and noise arising from the drill rig are in my opinion ambiguous and need to be clarified.	Drilling would not be considered a primary source of noise in terms of percentage of time that this takes place at the quarry. The drilling is for establishing blast holes so will be limited both within any week and within an average of a day. However, line of sight should be broken between the drilling and receptor points, and this will be the case once a depth of 5 metres is required. The reason this is not included within the planning statement is that the majority of drilling will be below this level.
If drilling represents a primary noise source it would seem appropriate to confirm both the assumptions made regarding the sound power level of plant to be used, and the assumption of 50% operational noise within an hour of drilling.	Based on a day average, 50% would be considered a conservative estimate of the drilling times as this is just for drilling blast holes.
It is unclear why there is a large disparity between the 302 HGV expected per weekday by Table 5.2 of the TR for 2mtpa output, and the 192 HGV derived from double the traffic implied from 1mtpa growth, as obtained by comparing the difference between Tables 3.4 and 3.5.	The applicant queries how the 192 HGV figure has been derived by the Council's Acoustic Consultant. Tables 3.4 and 3.5 illustrate base traffic flows on the relevant link roads around Whatley for the AM and PM peak hours only. In contrast, Table 5.2 outlines total HGV movements for each day. Furthermore, Table 5.2 is based on a worst-case scenario, i.e. Westdown (2mpta) + Whatley (2mpta). As such, the figures in Tables 3.4 and 3.5 are not comparable with this in Table 5.2.
While the movements of HGV from Whatley may be covered by the present consent, it may be helpful to clarify the associated changes to evening and night-time movements from Whatley Quarry brought about by this development.	As per Table 7.18 in the noise assessment set out in ES Chapter 7, haulage associated with Westdown is planned up to 20:00 on weekdays (Monday to Friday) and no evening period on weekends. No changes to HGV movements from Whatley, including evening and night-time movements, will be brought about by the proposed recommencement of mineral extraction at Westdown. Whatley HGV movements will remain as currently permitted by the extant 1996 consent.

5.3 Amendments to noise conditions

5.3.1 Appendix B of the Planning Statement, which supports all four applications, details the proposed Schedule of Conditions for the proposed recommencement of mineral extraction at Westdown Quarry. **Table 5.2** details the applicant's response to the suggested changes to the proposed noise conditions by the Council's Acoustic Consultant.

Table 5.2 Applicant's response to suggested changes to proposed noise conditions

Original proposed condition (as set out in Appendix B, Planning Statement (January 2021))	Revised condition (as proposed by SCC Acoustic Consultant)	Reason for change (as proposed by SCC Acoustic Consultant)	Applicant's comment
Condition 24 Noise associated with the operation of the site will be monitored and mitigated in accordance with the scheme submitted under Condition 3.	**Condition 24** Noise associated with the operation of the site will be monitored and mitigated in accordance with the scheme submitted under Condition 3 or a revision of this scheme agreed by the planning authority.	The initial details of routine monitoring of noise from the quarry will be in accordance with an agreed scheme. The locations of Lodge Hill Manor, Quarry Lodge and Rock Cottage that are identified in Figure 7.1 of the Environmental Statement may all be excessively influenced by local noise, making monitoring difficult. As such it may be necessary for the monitoring scheme to review the monitoring locations and possibly consider an approach that provides results more suited to predictive demonstration that impacts at noise sensitive locations are within permitted limits. The condition may need to recognise that the scheme would be likely to require modification as the quarry develops and should include a mechanism for periodic review.	Agree with recommended change although propose wording of revised planning conditions is amended as detailed below (with the suggested amendments in **bold** and/or ~~struck through~~): Noise associated with the operation of the site will be monitored and mitigated in accordance with the scheme submitted under Condition 3 or a revision of this scheme **as** agreed **in writing with** ~~by~~ the planning authority.
Condition 25 Except when short term temporary operations such as soil-stripping, the construction and removal of baffle mounds, soil storage mounds and spoil heaps, construction of new permanent landforms and aspects of site road construction and maintenance are taking place, the noise emitted from operations in the site shall not exceed 55dB LAeq, 1 hour	**Condition 25** Excluding noise from short term temporary operations (soil-stripping, construction and removal of baffle mounds, soil storage mounds and soil heaps, construction of new permanent landforms and aspects of site road construction and maintenance) the noise emitted from operations in the site shall not result in a free field level exceeding 47dB LAeq (1 hour) between the	The specification of the locations to which noise limits apply do not include Tonigre Cottage and clarification on this should be sought. In other respects, the noise limits suggested would apply to closest occupied properties and in my view, these may not therefore require specific reference, and can if appropriate be detailed within the monitoring scheme. The applicant's limits would exceed those granted to Bartletts	Tonigre Cottage can be included, but this was not considered one of the constraining residences. The suggested limits were based on receptors which had higher background noise levels; however it is appreciated that this should more appropriately be tailored to groups of receptors, some of which would have lower noise criteria based on the measured background and anticipated noise levels

Original proposed condition (as set out in Appendix B, Planning Statement (January 2021))	Revised condition (as proposed by SCC Acoustic Consultant)	Reason for change (as proposed by SCC Acoustic Consultant)	Applicant's comment
between the hours of 0700 to 1900 and shall not exceed 50dB LAeq, 1 hour between the hours of 0600 to 0700 and 1900 to 2000 at the properties/locations listed below and in Figure 7.1 of the Environmental Statement (Volume 3) *Noise Monitoring Locations* (dated January 2021). Measurements so taken shall have regard to the effects of extraneous noise and shall be corrected for any such effects. i. South Chantry; ii. Horn Street and West Nunney; iii. Broadgrove House Cloford; iv. Leighton; and v. Lodge Hill Manor and Downhead.	hours of 0600 to 1900 at any occupied residential property constructed prior to the grant of this consent.	Quarry when working in similar proximity to housing as they would appear to be based on the maximum allowance that may be granted under PPGM, rather than based on actual requirement. The ability of operations at Bartletts Quarry to proceed under the condition 19 of 2016/0025/CNT, might suggest that similar constraints were also appropriate to similar working distances, with possible allowance for a greater noise limit for initial top bench activities.	from the quarry. The application of a blanket 47 dB(A) does not however seem appropriate just because of consistency with another quarry. The noise limit should still relate to the background, up to the 55 dBA limit if there are practical difficulties to meet the background +10 dB limit.
Condition 26 Noise emitted as a result of short-term temporary operations such as soil-stripping, the construction and removal of baffle mounds, soil storage mounds and spoil heaps, construction of new permanent landforms and aspects of site road construction and maintenance, shall not exceed 70dB LAeq, 1hour at the properties/locations listed below and in Figure X Noise Monitoring Locations (dated XX). i. South Chantry; ii. Horn Street and West Nunney; iii. Broadgrove House Cloford; iv. Leighton; and v. Lodge Hill Manor and Downhead.	**Condition 26** Noise from short term temporary operations (soil-stripping, construction and removal of baffle mounds, soil storage mounds and spoil heaps, construction of new permanent landforms and aspects of site road construction and maintenance) shall not exceed a free-field level of 47dB(A) LAeq (1hour) for more than eight weeks in any 12-month period at any occupied residential property constructed prior to the grant of this consent or exceed the level of 60dB LAeq (1 hour).	The applicant has proposed two conditions 13 and 26 associated with the noise control of temporary operations and a further condition 9 restricting working hours (08.00 - 17.00 and 08.00 - 12.00). Noise predictions indicate the worst-case noise generated by the construction of the screen bunds would not exceed a level of 58dB(A). Based on similar reasoning to that above it would seem unnecessary to adopt the maximum allowance of noise granted for temporary works under PPGM and a single modified noise limit condition may suffice.	This is understood, but equally there does not seem a rationale for reducing the temporary criterion given the predictions are showing that noise would be up to 58 dB. The higher limit of 70 dB would allow for a reasonable buffer zone for short-term spikes in noise level and also would make it clearer if compliance monitoring was required so that there was no confusion with non-quarry noise sources.

Original proposed condition (as set out in Appendix B, Planning Statement (January 2021))	Revised condition (as proposed by SCC Acoustic Consultant)	Reason for change (as proposed by SCC Acoustic Consultant)	Applicant's comment
Condition 27 Blasting at the site will be monitored and mitigated in accordance with the scheme submitted under Condition 3.	**Condition 27** Blasting at the site will be monitored and mitigated in accordance with the scheme submitted under Condition xxx or a revision of this scheme agreed by the planning authority.	In line with my comments on the noise monitoring scheme the blast monitoring scheme may also find it necessary, or beneficial to obtain results closer to blasts so as to provide predictive demonstration that impacts at vibration sensitive locations are within permitted limits. This approach may help to avoid issues of no data from the failed triggering of vibrographs. As such a blasting monitoring scheme should include a mechanism for periodic review and modification.	Agree with recommended change although propose wording of revised planning conditions is amended as detailed below (with the suggested amendments in **bold** and/or ~~struck through~~): Blasting at the site will be monitored and mitigated in accordance with the scheme submitted under Condition xxx or a revision of this scheme **as** agreed **in writing with** ~~by~~ the planning authority.
Condition 28 All blasting operations in the area hereby permitted shall be designed not to exceed a peak particle velocity of 9mm per sec at 95% confidence level at the nearest residential property.	**Condition 28** All blasting operations in the area hereby permitted shall be designed to minimise vibration and air-overpressure in accordance with best practice and the details identified in the blast monitoring scheme. Blasts shall be designed using an identified regression design curve such that vibration does not exceed a peak particle velocity of 9mm/s to 95% confidence at any residential property constructed prior to the grant of this consent.	The limitation of blast vibration and air overpressure are linked to best practice and will relate to information in the blast monitoring scheme.	Agree with the recommended change.

6. Dust and air quality

6.1.1 In their letter, SCC state:

"No response has been received from the Environmental Health Officer. It is not clear why that is but I do not anticipate significant issues in relation to these matters subject to an acceptable Dust Management Plan being I place. It is hoped that a formal response will be received to the Reg 25 consultation exercise."

6.1.2 The proposed Schedule of Conditions as outlined in Appendix B of the Planning Statement which supports all four applications, includes for the provision of a Dust Management Plan.

6.1.3 We await any formal response from the Environmental Health Officer.

7. Rights of way

7.1 Regulation 25 additional information request

7.1.1 In their letter, SCC state:

"The County Council's RoW officer raises no objection subject to certain matters being clarified. Please can you review this consultation response and provide the necessary information."

7.1.2 In their response, the Council's Rights of Way (RoW) officer seeks clarification on the following:

- *"We require further clarity on the proposed crossing point over the bridleway SM 8/9, including detailed drawings showing the proposed corral and traffic light system and suggest the following condition,* ***No development hereby approved which shall interfere with or compromise the use of bridleway SM 8/9 shall take place until detailed drawings of the crossing point, corral and traffic light system have been submitted to and approved in writing by the Local Planning Authority***.
- *It is unclear how people using the PROWs will be notified of the blasting on a daily basis and clear advanced warning of blasting should be available to particularly equestrian users of the PROWs. We therefore suggest the following condition,* ***No development hereby approved which shall interfere with or compromise the health and safely of the public using the PROWs shall take place until a system of advance warning of quarry blasting has been submitted and approved in writing by the Local Planning Authority***.
- *There are opportunities for a linking path to a bridleway standard along the south-eastern and south-western edge of the main quarry site to link up with bridleway SM 8/9. We would welcome a dialogue with the applicants in order to progress and secure this opportunity."*

7.1.3 Each of the above is addressed in turn below.

7.2 Proposed crossing point over bridleway SM8/9

7.2.1 Hanson agree that further details regarding the proposed cross point over bridleway SM8/9 with the use of a proposed corral and traffic light system should be dealt with by planning condition and have no objection to the suggested wording.

7.3 Advance quarry blasting warnings to PROW users

7.3.1 As a responsible operator, Hanson is committed to providing advance warning of quarry blasts to all sensitive receptors including PROW users at their active sites, including at their nearby Whatley Quarry. It is agreed that this should be dealt with by planning condition and Hanson has no objection to the suggested wording.

7.4 Linking path opportunities

7.4.1 Linking and circular paths have been included in the proposed restoration designs for the proposed quarry as illustrated in ES Figure 3.8 (which is replicated in Figure 3.6 of the Planning Statement), as well as in **Figures 8.6**, **8.7** and **8.8** of this response. Hanson would welcome discussion with the County RoW officer to explore the possibility of providing further linking path opportunities subject to due consideration of health and safety practicalities.

8. Restoration

8.1 Regulation 25 additional information request

8.1.1 In their letter SCC state:

"It is evident that the consultee responses are generally supportive of the wider long term restoration goals proposed for Westdown. However, and linking back to the ecology section, it is also evident from the responses that the current proposal appears to overplay the longer term (many decades from now) benefits against the short and medium term impacts. This is an important point and it is considered that a review of this would be beneficial. Perhaps amendments to the phasing or general working arrangements could address this imbalance?"

8.2 Phased and progressive restoration of Westdown Quarry

8.2.1 As set out in the Planning Statement (Sections 3.10) and ES Chapter 3 (Section 3.3), restoration of Westdown Quarry will be done progressively. The proposed development, and the phasing thereof, has been restoration led, in line with industry best practise, and has been informed by and includes for the provision of appropriate mitigation measures to offset any short- and medium-term impacts particularly in terms biodiversity and ecology, as well as any long-term impacts.

8.2.2 Progressive restoration would occur across the site within the following areas:

- The progressive restoration of Asham Wood Void (where no extraction is to take place) during Phases 1-4 (including final soil placement and planting);
- The formation and planting of the perimeter screenbanks during Phases 1 and 2, which would remain in place as part of the final restoration of Westdown Quarry. The formation and planting of these screenbanks would commence as soon as possible at the start of Phase 1/Year 1, as illustrated in **Figures 8.1** and **8.2.** A cross-section illustrating the typical arrangement of the perimeter screen bank corridor is provided in **Figure 8.9** and includes upfront scrub band planting and the transplanting of existing hedgerows; and
- The progressive restoration of benches, quarry backfill tips and lake margins as the quarry is expanded and deepened.

8.2.3 Details of the progressive restoration to be undertaken throughout the phases of the proposed development has previously been included in the submitted phasing plans for Westdown as illustrated in ES Figures 3.3-3.7 and replicated in Figures 3.1-3.5 of the Planning Statement. Details of the proposed restoration masterplan and a series of cross sections across the restored Westdown Quarry have previously been provided in ES Figures 3.8 and 3.9 and replicated in Figures 3.6 and 3.7 of the Planning Statement.

8.2.4 Due to the complexities of the proposed development, it is apparent that the submitted phasing plans and restoration masterplan have not sufficiently highlighted those short- and medium-term mitigation measures included in the progressive restoration of the proposed development. As such, **Figures 8.1 to 8.5** illustrate further details in respect of

the short- and medium-term mitigation measures incorporated into the phased progressive restoration of Westdown Quarry which includes upfront off-site mitigation as illustrated in **Figure 2.1**. Details of the short-, medium- and long-term bat mitigation measures incorporated into the proposed development have previously been outlined in paragraphs 2.8.15 to 2.8.21 in Section 2.8 of this response. An overview of the final restoration for the Site is illustrated in **Figure 8.6** with separate, annotated plans which focus on Westdown Quarry and Asham Wood Void respectively, shown in **Figures 8.7** and **8.8**. To accompany these figures, a timeline and narrative of the proposed mitigation and progressive restoration is provided in **Table 8.1**.

Table 8.1 Timeline of proposed mitigation and progressive restoration for Westdown Quarry

Phase	Proposed mitigation measures and progressive restoration	Figure ref.
Upfront off-site mitigation (Year 1)	Creation of 18 ha of off-site (but adjoining) habitat including native, species-rich grassland (to be managed as pasture with a low stocking density or as a hay meadow), species rich hedgerows, and a mosaic of scrub, ponds and scrapes and tussocky grassland. This would be implemented as soon as the required planning approvals and legal agreements are in place. The planting mix for the proposed hedgerows is included in paragraphs 6.8.6-6.8.7 of ES Chapter 6, whilst the species included in the scrub mix are set out in ES Table 6.6. The planting mixes include a predominance of shrub species which are of value to dormice as set out in Table 1 of *The dormouse conservation handbook, second edition*[17].	**Figure 2.1**
Upfront mitigation (Year 1)	Creation of approximately 1.5 ha of upfront native scrub perimeter planting. This would be implemented as soon as the required planning approvals and legal agreements are in place. The planting mix for the proposed scrub is set out in ES Table 6.6 and includes a predominance of shrub species which are of value to dormice as set out in Table 1 of *The dormouse conservation handbook, second edition*[17].	**Figure 8.9**
Phase 1 (Up to the end of Year 3)	Existing vegetation: • Retention of all areas of woodland, scrub and grassland which lie outside of the areas required for site infrastructure/extent of quarry development. • Retention of all perimeter hedgerows. • Retention of all internal hedgerows with the exception of those which coincide with the extent of development footprint. • Lengths of internal hedgerow removed to be transplanted within the perimeter screen mound corridor (see **Figure 8.9**). • Tree stumps from within the development footprint used to form deadwood habitat piles. Proposed progressive restoration: • Construction and planting of perimeter screen mounds along the south-western and south-eastern boundaries of the Westdown Quarry Site (see **Figure 8.9**). The planting mix for the woodland and scrub planting is set out in ES Table 6.6 or would utilise translocated vegetation (including beneficial ground flora) from the woodland strip area.	**Figure 8.1**

[17] English Nature (2006). *The dormouse conservation handbook, second edition*.

Phase	Proposed mitigation measures and progressive restoration	Figure ref.
	• Commencement of progressive bench restoration across short lengths of the western quarry benches once quarry faces reach their final extraction limits. • Commencement of overburden placement within the southern part of Asham Quarry Void to create the restoration landform. Concrete tunnel(s) and other features will be buried within the tipped material to provide roosting opportunities for bats. Details to be finalised with local conservation bodies. • Soil placement and planting across the restoration landform within Asham Quarry Void in accordance with the broad principles outlined in the Restoration Plan (**Figure 8.8**). The planting mix for the woodland and scrub planting is included in ES Table 6.6. Detailed restoration to be designed and implemented in liaison with local conservation bodies.	
Phase 2 (Up to the end of Year 5)	Existing vegetation: • As described for Phase 1. Proposed progressive restoration (in addition to that described for Phase 1): • Construction and planting of perimeter screen mounds along the eastern and northern boundaries of the Westdown Quarry Site (see **Figure 8.9**). The planting mix for the woodland and scrub planting is set out in ES Table 6.6. • Further progressive bench restoration across western quarry benches once quarry faces reach their final extraction limits. • Continuing overburden placement to create the restoration landform within the northern part of the Asham Void. Concrete tunnel(s) and other features will be buried within the tipped material to provide roosting opportunities for bats. Details to be finalised with local conservation bodies. • Soil placement and planting across the restoration landform within Asham Quarry Void in accordance with the broad principles outlined in the Restoration Plan (**Figure 8.8**). The planting mix for the woodland and scrub planting is included in ES Table 6.6. Detailed restoration to be designed and implemented in liaison with local conservation bodies. • Landscape and ecological management to ensure the establishment and progressive development of all planting and other habitat creation implemented during Phase 1 (progressive bench restoration, perimeter screen corridor and restoration landform within Asham Quarry Void).	**Figure 8.2**
Phase 3 (Up to the end of Year 10)	Existing vegetation: • As described for Phase 1. Proposed progressive restoration (in addition to that described for Phases 1 and 2): • Further progressive bench restoration across northern quarry benches once quarry faces reach their final extraction limits. • Continuing overburden placement to create the restoration landform within the central part of the Asham Quarry Void. Concrete tunnel(s) and other features will be buried within the tipped material to provide roosting opportunities for bats. Details to be finalised with local conservation bodies.	**Figure 8.3**

Phase	Proposed mitigation measures and progressive restoration	Figure ref.
	• Soil placement and planting across the restoration landform within Asham Quarry Void in accordance with the broad principles outlined in the Restoration Plan (**Figure 8.8**). The planting mix for the woodland and scrub planting is included in ES Table 6.6. Detailed restoration to be designed and implemented in liaison with local conservation bodies. • Landscape and ecological management to ensure the establishment and progressive development of all planting and other habitat creation implemented during Phases 1 and 2 (progressive bench restoration, perimeter screen corridor and restoration landform within Asham Quarry Void).	
Phase 4 (Up to the end of Year 15)	Existing vegetation: • As described for Phase 1. Proposed progressive restoration (in addition to that described for Phases 1-3): • Further progressive bench restoration across northern, western and eastern quarry benches once quarry faces reach their final extraction limits. • Landscape and ecological management to ensure the establishment and progressive development of all planting and other habitat creation implemented during Phases 1 to 3 (progressive bench restoration, perimeter screen corridor and restoration landform within Asham Quarry Void).	**Figure 8.4**
Phase 5 (Up to the end of Year 20)	Existing vegetation: • As described for Phase 1. Proposed progressive restoration (in addition to that described for Phases 1-4): • Further progressive bench restoration across northern, western, south-eastern and eastern quarry benches once quarry faces reach their final extraction limits. • Landscape and ecological management to ensure the establishment and progressive development of all planting and other habitat creation implemented during Phases 1 to 4 (progressive bench restoration, perimeter screen corridor and restoration landform within Asham Quarry Void).	**Figure 8.5**
Final restoration	Delivery of the final restoration scheme concentrated across the: • Weighbridge, offices, wheelwash and vehicle parking area; • Quarry floor; • Temporary oolite and other unsaleable rock storage area; and • Stocking area and location of secondary and tertiary crushers and screens area.	**Figures 8.6-8.8**

8.2.5 As previously stated in our response to Natural England (see paragraph 2.2.6 of this response), the applicant has assumed that a commitment to providing upfront off-site mitigation would be provided by way of a Section 106 legal agreement and in accordance with an agreed Landscape and Ecological Management Plan (LEMP). The applicant would welcome further discussion and input from the relevant stakeholders, such as Natural England, the SCC County Ecologist and local conservation bodies, on the design and implementation of this off-site mitigation as the detail is developed.

8.3 Habitat gains and losses by phase

8.3.1 The broad areas of habitat lost and gained during each phase of the development is set out in **Table 8.2**. These broad areas have been calculated through reference to the Phase 1 habitat survey map in ES Appendix 11A (Figure 4.1), the phasing plans in **Figures 8.1** to **8.5**, the upfront off-site mitigation area in **Figure 2.1**, the principles set out for the perimeter screen bank corridor (**Figure 8.9**), and the restoration scheme as presented in **Figures 8.6** to **8.8**.

Table 8.2 Habitat gains and losses by phase

Phase	Loss (habitat and approximate length/area)	Gains (habitat and approximate length/area)
Upfront	Northern field (18.7 ha): • Arable land (18.7 ha)	Northern field (18.7 ha): • Native species rich hedgerow (1.87 km) • Tussocky grassland (3.7 ha) • Native scrub (1 ha) • Species-rich grassland (13.5 ha) • Ponds and scrapes (0.5 ha)
	Perimeter screen bank corridor: • Arable land (1.5 ha)	Perimeter screen bank corridor: • Scrub - dense/continuous (1.5 ha)
Phase 1 (End of Year 3)	Westdown Quarry (including perimeter screen bank corridor): • Arable land (6.2 ha). • Hedgerows (207 m) – to be translocated to perimeter screen bank corridor. • Broadleaved woodland – semi natural (0.7 ha). • Scrub - dense/continuous (2.0 ha). • Scrub – scattered (3.4 ha). • Ephemeral/short perennial (6.5 ha). • Bare ground (6.3 ha). • Calcareous grassland (0.5 ha).	Westdown Quarry (including perimeter screen bank corridor): • Native woodland (2.4 ha) • Calcareous grassland (0.3 ha)
	Asham Wood void (3 ha): • Broadleaved woodland – semi natural (0.1 ha). • Scrub - dense/continuous (0.1 ha). • Scrub – scattered (1.3 ha). • Ephemeral/short perennial (1.45 ha). • Bare ground (0.05 ha).	Asham Wood void (2.4 ha of restoration): • Native woodland (2.0 ha). • Calcareous grassland and quarry faces (0.4 ha).
Phase 2 (End of Year 5)	Westdown Quarry (including perimeter screen bank corridor): • Arable land (9.5 ha) • Broadleaved woodland – semi natural (0.1 ha). • Hedgerows (400 m) – to be translocated to perimeter screen bank corridor	Westdown Quarry (including perimeter screen bank corridor): • Native woodland (1.5 ha). • Calcareous grassland and quarry faces (0.3 ha). • Scrub - dense/continuous (0.1 ha).
	Asham Wood void (3.8 ha): • Scrub – scattered (1.6 ha). • Ephemeral/short perennial (2.1 ha).	Asham Wood void (2.5 ha of restoration): • Native woodland (1.7 ha). • Calcareous grassland (0.7 ha).

Phase	Loss (habitat and approximate length/area)	Gains (habitat and approximate length/area)
	• Bare ground (0.1 ha).	• Scrub - dense/continuous (0.1 ha).
Phase 3 (End of Year 10)	Westdown Quarry: • Arable land (9.8 ha) • Hedgerows (310 m) – to be translocated to perimeter screen bank corridor. • Broadleaved woodland – semi natural (0.8 ha). • Scrub - dense/continuous (1.0 ha). • Calcareous grassland (0.2 ha). Asham Wood void (3.8 ha): • Scrub – scattered (2.4 ha). • Ephemeral/short perennial (1.0 ha). • Bare ground (0.4 ha).	Westdown Quarry: • Calcareous grassland and quarry faces (1.0 ha). • Scrub - dense/continuous (0.2 ha). Asham Wood void (5.7 ha of restoration): • Native woodland (3.7 ha). • Calcareous grassland (1.8 ha). • Scrub - dense/continuous (0.2 ha).
Phase 4 (End of Year 15)	Westdown Quarry: • Arable land (2.8 ha) • Hedgerows (410 m) – to be translocated to perimeter screen bank corridor.	Westdown Quarry: • Calcareous grassland and quarry faces (0.8 ha). • Scrub - dense/continuous (0.4 ha). • Lakeside grassland (1.2 ha).
Phase 5 (End of Year 20)	Westdown Quarry: • Arable land (6.7 ha) • Hedgerows (530 m) – to be translocated to perimeter screen bank corridor. • Scrub - dense/continuous (0.3 ha). • Parkland and scattered trees – broad-leaved (0.3 ha). • Neutral grassland – semi – improved (0.1 ha)	Westdown Quarry: • Calcareous and lakeside grassland and quarry faces (2.2 ha). • Scrub - dense/continuous (0.1 ha).

8.3.2 The habitats proposed as part of the final restoration of the site are included as part of the HEP reporting in **Appendix C**.

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146000 145500 145000 144500

Upgraded site access

BULLS GREEN LINK ROAD

STONY LANE

C2533/WHATLEY ROAD

A361

STEARTS LANE

Dead Woman's Bottom

Upfront offsite mitigation area - see Figure 2.1 for details and key

Perimeter hedgerows along eastern and northern boundaries to be retained.

Woodland soils stripped from this area to be spread on perimeter screen bund surface

Concrete tunnel(s) and other features to be buried in tipped material to provide roosting opportunities for bats. Details to be finalised with local conservation bodies.

Internal hedgerows progressively removed through Phases 1 to 5 to be translocated to the perimeter screen bank connecting corridor (see cross section in Figure 8.9).

Perimeter upfront mitigation and screen bank corridor (see cross section in Figure 8.9)

Perimeter hedgerows along south-western and south-eastern boundaries to be retained.

Westdown Farm

Colemans Quarry

Torr Works

Asham Wood

Leighton Hanging

Heale Ladder

Tom Tivey's Hole

Tongre Cottage

El Dist Sta

Pit (dis)

Drain

Key

- Westdown consolidating planning submission area
- Offsite mitigation boundary
- Contour (1m interval)
  * OS Terrain 5 contours at 2m intervals are shown in the absence of detailed 1m contour topographical data
- Limestone extraction and direction of working
- Haul road
- Existing habitats to be retained
- Planted overburden and soil bund
- Planted topsoil bund
- Progressive restoration of Asham Void using oolitic overburden and other unsaleable rock materials - working area
- Progressive restoration
- Weighbridge, offices, wheelwash and vehicle parking (indicative location)
- Stocking area and location of secondary and tertiary crushers and screens
- Electronically controlled crossing point for bridleway
- Indicative location for settlement and/or attenuation drainage infrastructure

0 m 400 m

Scale 1:7500 @ A3

Westdown Quarry Regulation 25 Submission

Figure 8.1
Phase 1 (End of Year 3)

June 2022

wood.

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Upgraded site access

Concrete tunnel(s) and other features to be buried in tipped material to provide roosting opportunities for bats. Details to be finalised with local conservation bodies.

Establishment and gradual maturation of woodland, scrub and grassland introduced in Phase 1

Progressive restoration of benches which have reached their final extraction limits.

Establishment and gradual maturation of woodland and shrub planting undertaken in Phase 1 within the screen bank corridor to provide enhanced visual and ecological mitigation.

Upfront offsite mitigation area - see Figure 2.1 for details and key

Perimeter hedgerows along eastern and northern boundaries to be retained.

Internal hedgerows progressively removed through Phases 1 to 5 to be transplanted to the perimeter screen bank connecting corridor (see cross section in Figure 8.9).

Perimeter hedgerows along south-western and south-eastern boundaries to be retained.

BULLS GREEN LINK ROAD

STONY LANE

C2533/WHATLEY ROAD

A361

STEART'S LANE

Dead Woman's Bottom

Ashem Wood

Leighton Hanging

Heale Ladder

Tom Tivey's Hole

Torr Works

Westdown Farm

Colemans Quarry

Torrigre Cottage

Key

- Westdown consolidating planning submission area
- Offsite mitigation boundary
- Contour (1m interval)
  * OS Terrain 5 contours at 2m intervals are shown in the absence of detailed 1m contour topographical data
- Limestone extraction and direction of working
- Haul road
- Existing habitats to be retained
- Planted overburden and soil bund
- Planted topsoil bund
- Progressive restoration of Asham Void using oolitic overburden and other unsaleable rock materials - working area
- Progressive restoration
- Weighbridge, offices, wheelwash and vehicle parking (indicative location)
- Stocking area and location of secondary and tertiary crushers and screens
- Electronically controlled crossing point for bridleway
- Indicative location for settlement and/or attenuation drainage infrastructure

0 m 400 m

Scale 1:7500 @ A3

Westdown Quarry Regulation 25 Submission

Figure 8.2
Phase 2 (End of Year 5)

June 2022

wood.

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Upgraded site access

Progressive restoration of benches which have reached their final extraction limit.

Establishment and gradual maturation of woodland, scrub and grassland introduced in Phase 2

Concrete tunnel(s) and other features to be buried in tipped material to provide roosting opportunities for bats. Details to be finalised with local conservation bodies.

Continued maturation of woodland, scrub and grassland introduced in Phase 1

Upfront offsite mitigation area - see Figure 2.1 for details and key

Gradual maturation of woodland and shrub planting undertaken in Phase 2 within the screen bank corridor to provide enhanced visual and ecological mitigation

Perimeter hedgerows along eastern and northern boundaries to be retained.

Internal hedgerows progressively removed through Phases 1 to 5 to be transplanted to the perimeter screen bank connecting corridor (see cross section in Figure 8.9).

Continued maturation of woodland and shrub planting undertaken in Phase 1 within the screen bank corridor.

Perimeter hedgerows along south-western and south-eastern boundaries to be retained.

BULLS GREEN LINK ROAD

STONY LANE

C2533/WHATLEY ROAD

A361

STEART'S LANE

Colemans Quarry

Westdown Farm

Torr Works

Ashem Wood

Leighton Hanging

Heale Ladder

Tom Tivey's Hole

Key

- Westdown consolidating planning submission area
- Offsite mitigation boundary
- Contour (1m interval)
  * OS Terrain 5 contours at 2m intervals are shown in the absence of detailed 1m contour topographical data
- Limestone extraction and direction of working
- Haul road
- Existing habitats to be retained
- Topsoil bund
- Material from relocated soil store
- Progressive restoration of Asham Void using oolitic overburden and other unsaleable rock materials - working area
- Progressive restoration
- Temporary oolite and other unsaleable rock storage
- Weighbridge, offices, wheelwash and vehicle parking (indicative location)
- Stocking area and location of secondary and tertiary crushers and screens
- Electronically controlled crossing point for bridleway
- Indicative location for settlement and/or attenuation drainage infrastructure

0 m 400 m

Scale 1:7500 @ A3

Westdown Quarry Regulation 25 Submission

Figure 8.3
Phase 3 (End of Year 10)

June 2022

wood.

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Progressive restoration of benches which have reached their final extraction limits.

Upgraded site access

Upfront offsite mitigation area - see Figure 2.1 for details and key

Continued maturation of woodland and shrub planting undertaken in Phase 2 within the screen bank corridor.

Perimeter hedgerows along eastern and northern boundaries to be retained.

Internal hedgerows progressively removed through Phases 1 to 5 to be transplanted to the perimeter screen bank connecting corridor (see cross section in Figure 8.9).

Continued maturation of woodland and shrub planting undertaken in Phase 1 within the screen bank corridor.

Perimeter hedgerows along south-western and south-eastern boundaries to be retained.

Asham Void restoration complete

BULLS GREEN LINK ROAD

STONY LANE

C2533/WHATLEY ROAD

A361

STEART'S LANE

Colemans Quarry

Westdown Farm

Asham Wood

Leighton Hanging

Heale Ladder

Tom Tivey's Hole

Torr Works

Tongre Cottage

Key

- Westdown consolidating planning submission area
- Offsite mitigation boundary
- Contour (1m interval)
  * OS Terrain 5 contours at 2m intervals are shown in the absence of detailed 1m contour topographical data
- Limestone extraction and direction of working
- Haul road
- Existing habitats to be retained
- Topsoil bund
- Material from relocated soil store
- Progressive restoration
- Temporary oolite and other unsaleable rock storage
- Weighbridge, offices, wheelwash and vehicle parking (indicative location)
- Stocking area and location of secondary and tertiary crushers and screens
- Electronically controlled crossing point for bridleway
- Indicative location for settlement and/or attenuation drainage infrastructure

0 m 400 m

Scale 1:7500 @ A3

Westdown Quarry Regulation 25 Submission

Figure 8.4
Phase 4 (End of Year 15)

May 2022

wood.

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Upgraded site access

Upfront offsite mitigation area - see Figure 2.1 for details and key

Continued maturation of woodland and shrub planting undertaken in Phase 2.

Perimeter hedgerows along eastern and northern boundaries to be retained.

Progressive restoration of benches which have reached their final extraction limit.

Continued maturation of woodland and shrub planting undertaken in Phase 1 within the screen bank corridor.

Perimeter hedgerows along south-western and south-eastern boundaries to be retained.

Continued maturation of Asham Void restoration

BULLS GREEN LINK ROAD

STONY LANE

C2533/WHATLEY ROAD

A361

STEART'S LANE

Colemans Quarry

Ashtorn Wood

Leighton Hanging

Heale Ladder

Tom Tivey's Hole

Torr Works

Topgre Cottage

Key

- Westdown consolidating planning submission area
- Offsite mitigation boundary
- Contour (1m interval)
  * OS Terrain 5 contours at 2m intervals are shown in the absence of detailed 1m contour topographical data
- Limestone extraction and direction of working
- Haul road
- Existing habitats to be retained
- Topsoil bund
- Subsoil bund
- Material from relocated soil store
- Progressive restoration
- Temporary oolite and other unsaleable rock storage
- Weighbridge, offices, wheelwash and vehicle parking (indicative location)
- Stocking area and location of secondary and tertiary crushers and screens
- Electronically controlled crossing point for bridleway
- Indicative location for settlement and/or attenuation drainage infrastructure

0 m 400 m

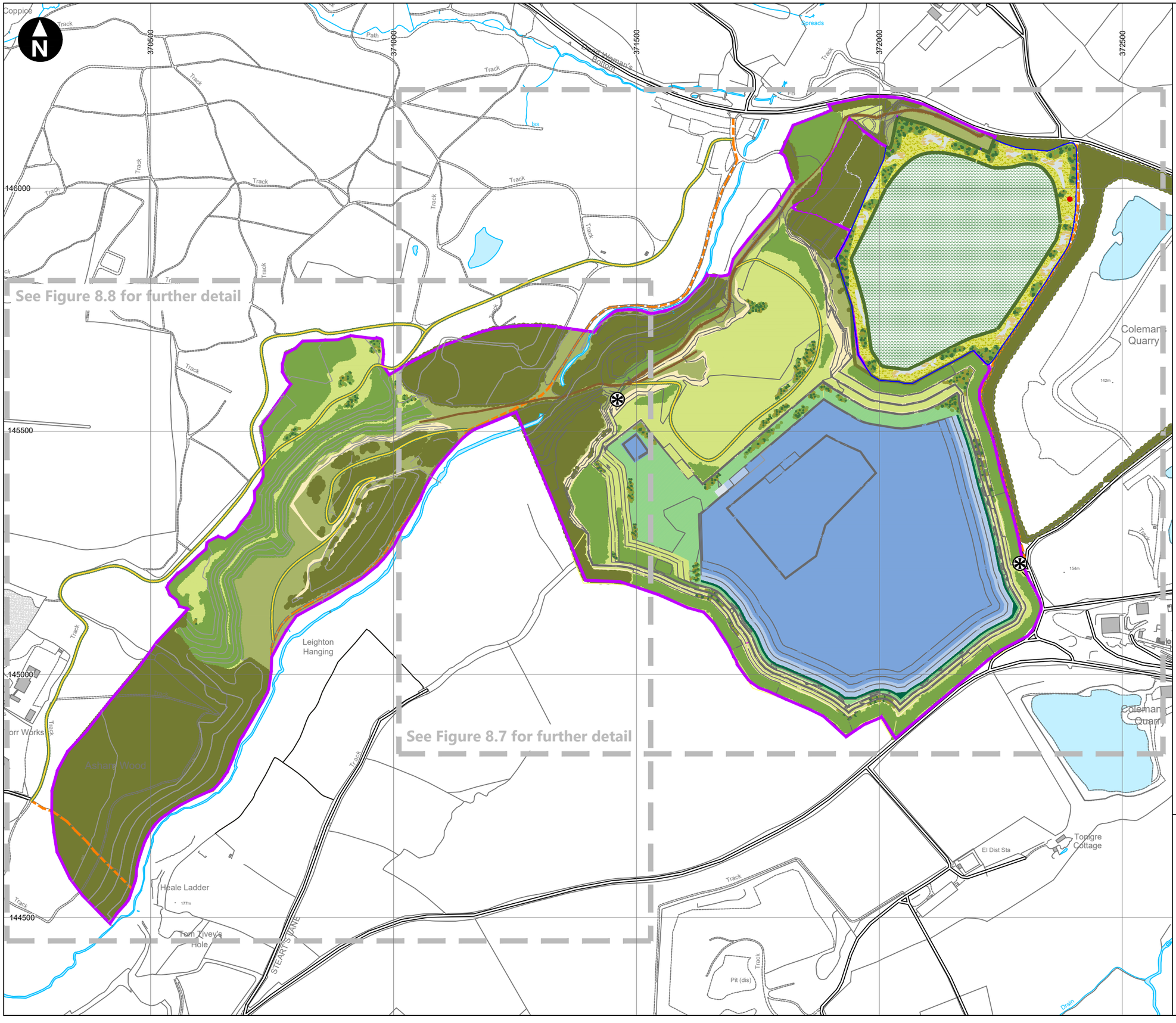
Scale 1:7500 @ A3

Westdown Quarry Regulation 25 Submission

Figure 8.5
Phase 5 (End of Year 20)

June 2022

wood.



Key

- Westdown consolidating planning submission area
- Offsite mitigation boundary
- Existing trees, scrub and hedgerow
- Existing grassland and open mosaic habitat on previously developed land
- Existing Public Right of Way
- Proposed trees / woodland
- Proposed scrub
- Proposed hedgerow
- Proposed calcareous grassland
- Proposed lakeside grassland
- Proposed tussocky grassland
- Proposed species-rich grassland
- Proposed marginal planting and shallow water (<3m deep)
- Proposed water (3-10m deep)
- Proposed water (10m+ deep)
- Proposed ponds and scrapes
- Contour (5m interval) (120)
  * OS Terrain 5 contours at 10m intervals are shown in the absence of detailed topographical survey data
- Quarry faces
- Access track (emergency and maintenance access only)
- Proposed permissive paths
- Proposed viewpoint location
- Proposed bat house

0 m — 400 m

Scale 1:7500 @ A3

Westdown Quarry Regulation 25 Submission

Figure 8.6
Restoration Plan - Overview

June 2022

wood.

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Opportunities for circular walking routes connecting to the existing bridleway and provision of a viewing area.

Opportunities for enhanced public access within Asham Wood with permissive paths utilising existing tracks and linking PRoWs SM 8/9 and SM 8/11.

Species-rich grassland to be managed as pasture with a low stocking density or as a hay meadow under an appropriate agri-environment scheme.

Mosaic of tussocky grassland, pockets of native scrub and ponds/scrapes bound by species-rich native hedgerow. Ponds and scrapes to be designed and constructed in partnership with local conservation groups.

1:2 to 1:3 slopes create shallows for marginal planting around the eastern, southern and south-western edges of the waterbody.

Woodland planting on upper slopes provides increased habitat connectivity between Asham Wood and the perimeter of the quarry and wider landscape.

Assumed water level 120m AOD

Provision of a viewing platform and information board(s) accessed via bridleway FR 12/43

Lakeside grassland across the 120m AOD level to include occasional scrapes and small pools for the benefit of invertebrates, reptiles and amphibians as well as native trees and shrubs.

Perimeter screenbank planting (mixed native trees and shrubs) to be implemented during Phases 1 and 2.

Quarry benches restored to calcareous grassland, trees and scrub to provide a mosaic of habitats. Short sections of south facing quarry bench to remain unvegetated (or sparsley vegetated) for the benefit of invertebrates.

BULLS GREEN LINK ROAD

BRIDLEWAY SM 8/9

BRIDLEWAY FR 12/43

C2533 / WH

A361

Track

FB

142m

Key

- Westdown consolidating planning submission area
- Offsite mitigation boundary
- Existing trees, scrub and hedgerow
- Existing grassland and open mosaic habitat on previously developed land
- Existing Public Right of Way
- Proposed trees / woodland
- Proposed scrub
- Proposed species-rich hedgerow
- Proposed calcareous grassland
- Proposed lakeside grassland
- Proposed tussocky grassland
- Proposed species-rich grassland
- Proposed marginal planting and shallow water (<3m deep)
- Proposed water (3-10m deep)
- Proposed water (10m+ deep)
- Proposed ponds and scrapes
- Contour (5m interval) * OS Terrain 5 contours at 10m intervals are shown in the absence of detailed topographical survey data
- Quarry faces
- Access track (emergency and maintenance access only)
- Proposed permissive paths
- Proposed viewpoint location
- Proposed bat house

0 m 300 m

Scale 1:5000 @ A3

Westdown Quarry Regulation 25 Submission

Figure 8.7
Restoration Plan - Westdown Quarry detail

June 2022

wood.

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Asham Wood Void restored to wooded slopes linking existing areas of woodland and providing bat navigational routes. Scrub, calcareous grassland and bare rubble/rock screes enhance habitat diversity.
Detailed restoration to be designed and implemented in partnership with local conservation bodies.

Opportunities for enhanced public access within Asham Wood with permissive walking routes utilising existing tracks and linking PRoWs SM 8/9 and SM 8/11.

Open mosaic habitat on previously developed land and quarry faces to be retained.

The southern end of the proposed landform seeks to recreate the natural side-valley of the Tunscombe Valley.

BRIDLEWAY SM 8/9

Asham Wood

Torr Works

Leighton Hanging

Heale Ladder

Tom Tivey's Hole

Track

Pit (dis)

Conveyors

145500

145000

144500

177m

Key

- Westdown consolidating planning submission area
- Existing trees and shrubs
- Existing grassland and open mosaic habitat on previously developed land
- Existing Public Right of Way
- Proposed trees / woodland
- Proposed scrub
- Proposed calcareous grassland
- Proposed lakeside grassland
- Proposed water (10m+ deep)
- Contour (5m interval)
  * OS Terrain 5 contours at 10m intervals are shown in the absence of detailed topographical survey data
- Quarry faces
- Access track (emergency and maintenance access only)
- Proposed permissive footpath
- Proposed viewpoint location

0 m 300 m

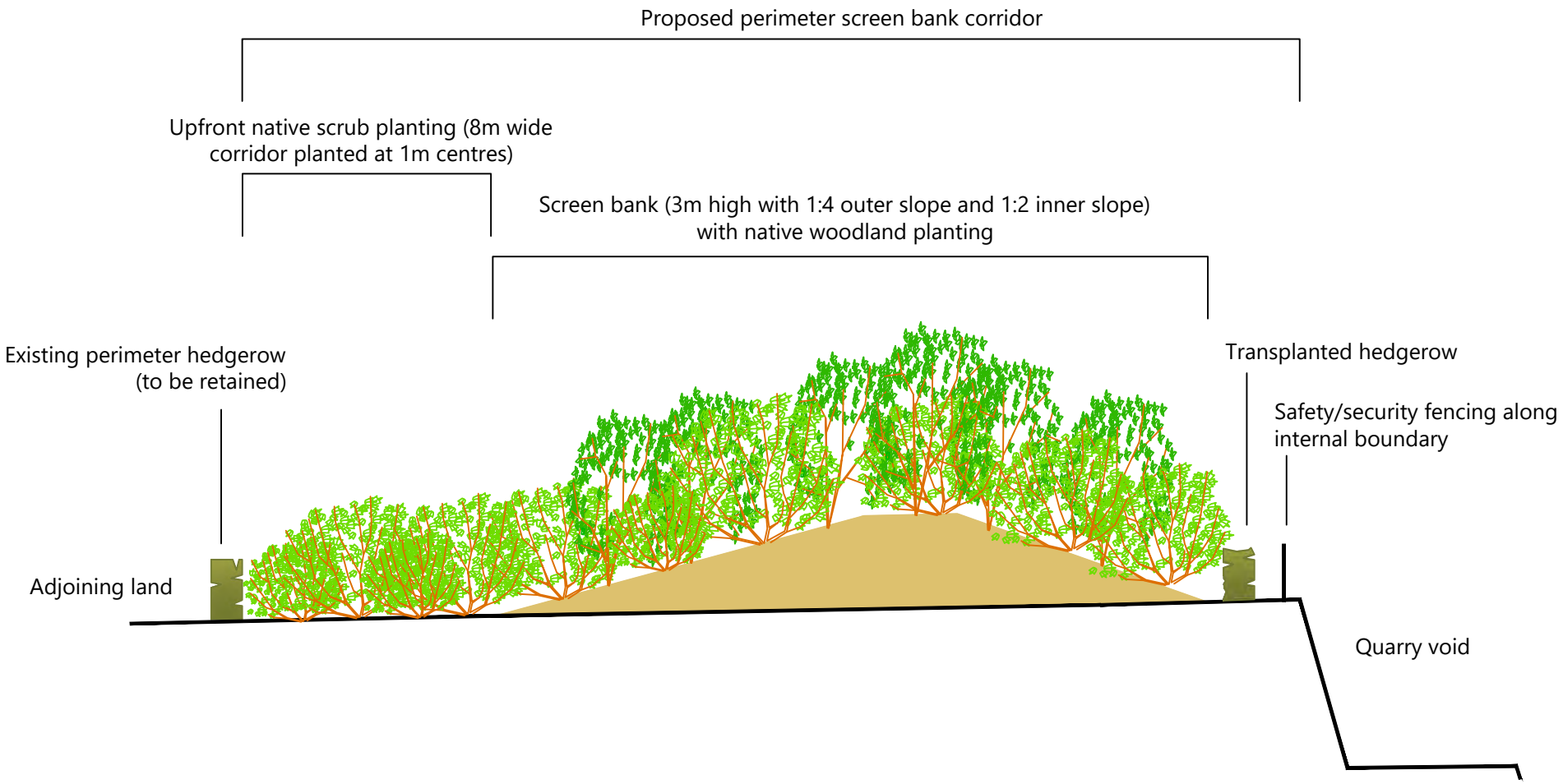
Scale 1:5000 @ A3

Westdown Quarry Regulation 25 Submission

Figure 8.8
Restoration Plan - Asham Wood Void detail

June 2022

wood.



0 m 10 m

Scale 1:200 @ A3

Westdown Quarry Regulation 25 Submission

Figure 8.9
Typical cross section through perimeter upfront mitigation and screen bank corridor

June 2022

wood.

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9. Cllr Tom Ronan, Mendip District Council

9.1.1 Councillor Tom Ronan is the Cabinet Member for Strategic Policy and Climate Change for Mendip District Council. Councillor Ronan submitted comments in response to the four Westdown applications in June 2021 stating that the reopening of Westdown Quarry poses a substantial threat the Council's progress to deliver on its Climate and Ecological Emergency, in conjunction with the collective aims of the Somerset-wide Climate Emergency Strategy.

9.1.2 Councillor Ronan submitted additional comments to SCC in May 2022 following the adoption by Mendip District Council in August 2021 of their Carbon Management Plan, which sets out a list of targets and the future emissions pathway for the district reach carbon neutrality by 2030.

9.1.3 Due consideration of SCC's 2020 Climate Emergency Strategy for Somerset is detailed in Section 5.5 of the submitted Planning Statement.

9.1.4 In response to Councillor's comments, the applicant seeks to reiterate that the proposed recommencement of mineral extraction at Westdown is not a new development but that the principle of mineral extraction is already established by way of the extant consent. Thus, the purpose of the applications is to regularise this extant consent to ensure the proposed recommencement of mineral extraction can take place in accordance with modern environmental and operational standards.

9.1.5 As a responsible mineral operator, Hanson is committed to fulfilling their role in meeting the UK government's net zero carbon ambitions and their parent company, HeidelbergCement Group, has signed the Business Ambition for 1.5˚C Commitment and joined the UN's Race to Zero campaign. Hanson's route to decarbonisation has been ongoing for many years and they have made significant headway. A roadmap is in place, which includes a number of important areas that will help Hanson achieve net zero carbon by 2050. This includes:

- Increased use of alternative raw materials and alternative fuels
- Carbon capture and storage
- Fuel switching to hydrogen
- Use of reduced CO2 products
- Improvements to plant efficiency and processes across their operations.

9.1.6 Hanson's CO_2 emissions have already been reduced by 50% in the UK since 1990 and the company is investing £55 million by 2025 to help cut this by a further 15%. As indicated, Hanson aims to reach net zero carbon by 2050 and are involved in a number of industry-leading carbon reduction projects. These include carbon capture storage at their Padeswood cement works planned to be operational by 2027 and a successful world first net zero carbon fuel mix trial at their Ribblesdale works in 2021. Copies of Hanson's

'Committed to reaching net zero carbon by 2050' and their Carbon Reduction Plan (March 2022) are appended in **Appendix E**.

Appendix A
Previously submitted applicant's rebuttal to other material planning considerations raised by the public (September 2021)

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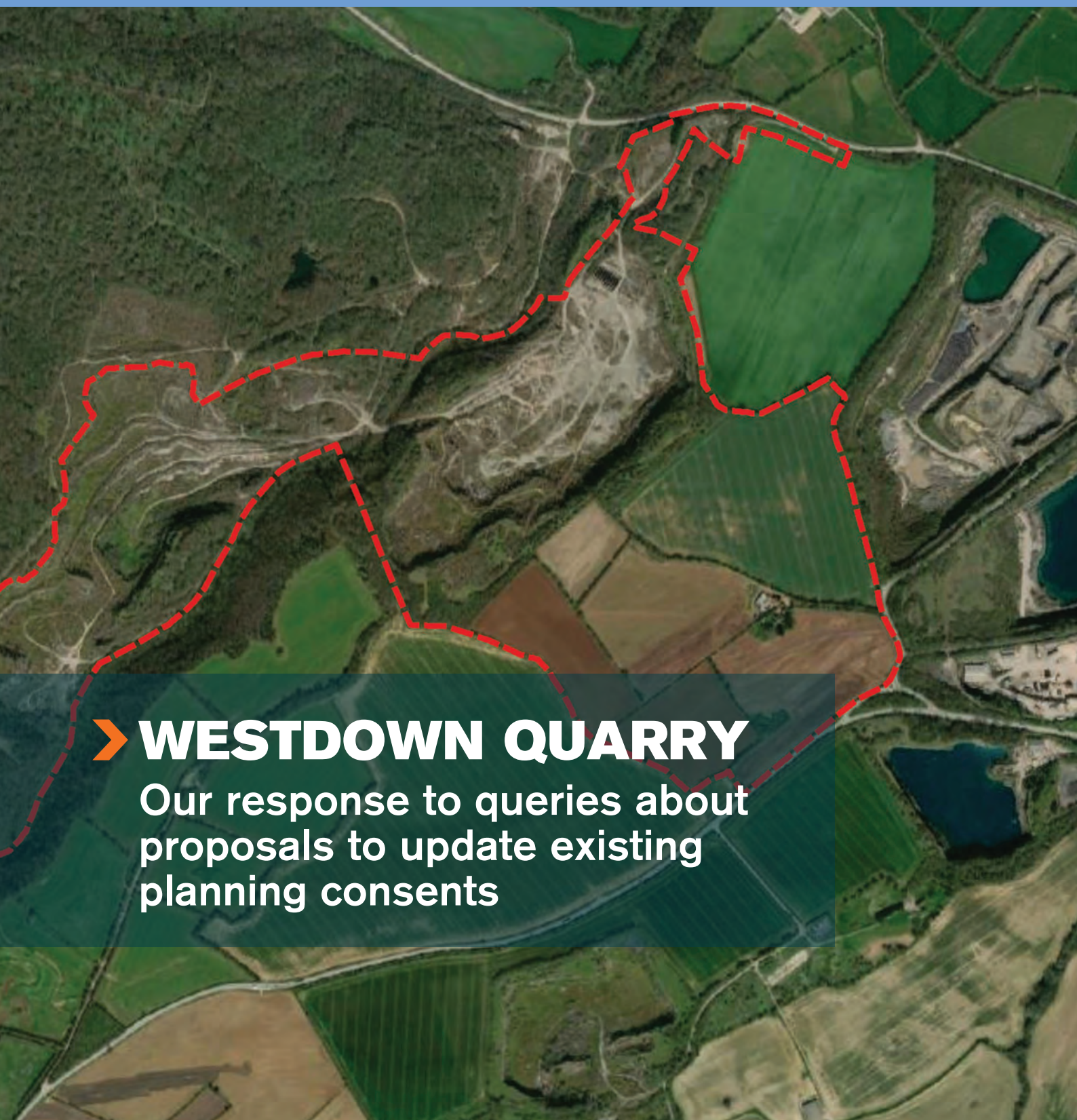

WESTDOWN QUARRY

Our response to queries about proposals to update existing planning consents

INTRODUCTION

Following attendance at recent parish council meetings in the communities around Westdown, we wanted to provide further detail on some key aspects of our proposals in response to the queries received from local people.

We've also been listening to feedback. And, as part of our commitment to be a good neighbour, we have clarified our position on a number of issues and indicated where we would be seeking to work closely with local stakeholders in the future to further develop and implement aspects of our proposals.

BACKGROUND

Westdown quarry has permission for mineral extraction until 2042, though it has not been operational since the late 1980s. Our application to Somerset County Council (SCC) is focused on bringing the existing permissions in line with modern environmental standards and quarrying practices and includes extensive mitigation measures to reduce any potential impacts on local communities and the environment.

Importantly, our proposals include significant ecological enhancements through the restoration of the adjacent Asham Wood void area and the progressive restoration of the quarry. This transformative legacy project will provide extensive biodiversity enhancements with the proposals shaped by the need to protect and enhance wildlife habitats. The plans will also deliver safer access for pedestrians and horse-riders.

Restarting operations at Westdown will help to secure long-term supplies of vital construction materials. Our approach is also to use Westdown's location, close to key road routes, to supply local demand, freeing up the rail link at our nearby Whatley quarry to allow more material for national markets to go by rail. This will help to cut our carbon footprint and reroute vehicles away from local villages. The overarching principle is that the operations of both quarries, including mineral volumes and vehicle movements, will not exceed the current permitted extraction levels for Whatley.

September 2021

Hanson
HEIDELBERGCEMENTGroup

Response to feedback
1. Environment and restoration

We were asked about the environmental impact of our plans and for more detail about the restoration proposals, especially in light of concerns that biodiversity gains achieved since the quarry closed would be lost.

OUR RESPONSE

- Hanson's parent company, HeidelbergCement, is the first company in the construction sector to adopt group-wide guidelines for species protection. And, in the UK, many of our sites have already made a positive contribution, with a number designated as Sites of Special Scientific Interest (SSSIs). In addition, we have developed Memorandums of Understanding with both Natural England and Countryside Council for Wales recognising the importance of bio and geodiversity and our commitment to natural resource protection and enhancing the environment.

- The Environmental Impact assessment (EIA), that informed the development of the Environmental Statement (ES) which supported our planning application, involved a thorough review of the potential effects of our proposals for Westdown. The purpose of the EIA is to identify how people and the environment could be affected by the proposals and to put forward mitigation measures that would avoid, minimise or offset any negative effects. A key aspect of our ES for Westdown, underpinned by the studies carried out in the EIA, is that that restoration of the quarry will be carried out progressively during the active phase of the quarry. This will help to ensure the promotion of biological diversity from the resumption of activities at Westdown.

- In the quarry itself, the restoration proposals would create a wide range of new habitats across the whole of the proposed development site including new woodland, scrub and calcareous grassland, with exposed quarry faces and areas of water body and marginal habitat also contributing to a diverse landscape within the site boundary. Native mixed broadleaved woodland and scrub mixes would be based on those set out in the detailed landscaping and planting mitigation strategy, which would be agreed prior to the resumption of quarrying.

- The progressive restoration of the Asham Wood void area, where no mineral extraction will be taking place, would take place from the end of year 3 to year 15 of resumed operations. The approach will be to maximise the beneficial use of historic soils and soil-forming materials stripped from previously disturbed areas in order to make optimum use of the diverse woodland and grassland seed bank that has developed since original quarry workings. Some small sections of landform would also be retained as bare rubble/rock screes to enhance habitat diversity.

- In addition, the restoration proposals for the Asham Wood void have been designed to reflect the key characteristics of the Mendip Landscape Character Area (LCA A10.4) which describes the location as a "steep sided deep valley section" and "heavily wooded". The proposed approach will include:

  - The wooded slopes serving as linear landscape features to act as bat navigation routes along the created slopes and also within the in the flatter upper area.

  - Replicating the bands of vegetation that follow the existing faces within the Asham Wood void and creating connectivity between existing areas of woodland to provide foraging and connective habitat for species such as bats and dormice.

  - The addition of embedded pipe roosting features within the tip slopes to enhance the bat focused restoration of the Asham Wood void. The detailed restoration would be developed in collaboration with local bat groups to ensure that bat focused and ecology-led restoration is delivered.

- In summary, our ES demonstrated that the proposed development has been designed in a careful and considered way, which fully mitigates most of the anticipated effects that would be brought on by the resumption of mineral extraction at Westdown quarry.

Local residents asked for more information on the biodiversity action plan, particularly in relation to how ash dieback disease would be addressed.

OUR RESPONSE

- All Hanson's quarry sites have a Biodiversity Action plan and plans are underway for all our quarrying operations to carry out biodiversity net impact assessments by 2025 in conjunction with BirdLife International.
- Our proposals for Westdown set out that we will prepare and implement a Landscape Mitigation Strategy. This will include a detailed planting scheme, as well as a Landscape and Ecology Management Plan (LEMP) and a Habitat Management Plan (HMP). Our approach will be to develop these collaboratively in conjunction with stakeholders to underpin the protection and enhancement of biodiversity at the site and will be formally agreed with SCC prior to Westdown reopening.
- Ash dieback disease was considered as part of the future baseline in the Landscape and Visual Impact Assessment (LVIA) in our ES. Hanson also already has an approved Forestry Commission Woodland Management Plan for the Asham Wood (SSSI) drawn up in conjunction with Natural England and other stakeholders, including Somerset Wildlife Trust. However, with the extent of ash dieback becoming more readily understood, we now are working with these groups to review and update the plan. We'll share more details with local stakeholders on this in the future.

We were asked about the impact of our proposals on Chantry Pond.

OUR RESPONSE

- A hydrological and hydrogeological assessment, covering surface and groundwater, was carried out as part of the development of our proposals. This included assessing the potential effects on water dependent conservation sites, such as Chantry Pond, as well as the development of measures to avoid, reduce or compensate for the potential effects on the water environment close to Westdown. Measures to be included in a Construction Environment Management Plan (CEMP) will include:
  - ☐ Runoff to be controlled by the use of settlement lagoons to collect rainfall, runoff and intercepted groundwater.
  - ☐ Compound area to be constructed using Sustainable urban Drainage System (SuDS) principles.
  - ☐ No mineral extraction, soil/overburden storage, ground raising or attenuation lagoons in areas categorised as Flood Zone 2 or 3.
- Our studies concluded that the effect of our proposals on the water environment supporting Chantry Pond would be negligible.

We were asked why Red Kites did not feature within our Environmental Statement.

OUR RESPONSE

The studies that informed our ecological assessment as part of the EIA were based on a summary of the protected species records from Somerset Ecological Records Centre (SERC). This details no record of Red Kites within the site and immediately outside the site area over the past 10 years. Similarly, a Phase 1 Habitat survey carried out using the accepted methodology (after JNCC, 2010) over the site and a 50m surrounding buffer area, in July 2020, also recorded no Red Kites.

Response to feedback
2. Traffic and transport

Local people expressed concerns about increased HGV traffic on local roads.

OUR RESPONSE

- The overarching principle for our quarries in the East Mendips is that is that the operations of both Whatley and a reopened Westdown will not exceed the current permitted mineral volumes and vehicle movement levels for Whatley:
  - Whatley quarry is permitted to transport up to 4 million tonnes per annum (mtpa) via road. It is intended that the 2mpta future activity at Westdown would be in lieu of these agreed traffic volumes, as set out in the planning conditions for Whatley quarry. This means that HGV traffic from Westdown quarry and Whatley quarry combined will not exceed 4mtpa.
  - The traffic and transport assessment considered the impact on local roads and concluded that the resumption of mineral development at Westdown quarry will have no significant traffic effects.

We were asked why the proposals include sending all HGVs via the A361 to reach the A37, rather than traffic heading north using the Bulls Green Link Road.

OUR RESPONSE

- Our proposals were developed to align with SCC's Freight Strategy (December 2011), which identifies the Old Wells Road (B3134) as a local freight route and the A361 as a county freight route. Consequently, our proposals are based on adhering with the need for all vehicles – regardless of their ultimate direction – to turn right out of the site onto the Bulls Green Link Road, before travelling along the C2533 to the A361 and continuing their onward journeys in line with SCC's adopted freight strategy.
- We acknowledge the feedback received on this issue and understand local people's concerns about north-bound HGVs initially having to travel south before continuing along the A361 to reach the A37. On review, we believe that either the proposed route (described above), or the use of the Old Wells Road (B3134) would represent a suitable route for quarry vehicles to travel north. We are now following up with SCC's highways team to discuss this in more detail and to seek their guidance on this important issue.

We were asked if Hanson would commit to preventing its HGVs from using the Waterlip cut through to travel from the A361 to the Old Wells Road.

OUR RESPONSE

- We would be willing to enter into a formal Section 106 agreement, a legal planning obligation, committing our HGVs to only using the routes set out in the planning submission. This would mean that our HGVs would be precluded from using the route through the village of Waterlip.

We were asked if Hanson would contribute via Section 106 or other arrangements to improving the Beacon junction.

OUR RESPONSE

- Our detailed traffic and transport assessment assessed the impact of the proposed development traffic on the surrounding network and key junctions. Although it concluded that development traffic can be accommodated on the existing transport network, in light of ongoing liaison with SCC on highway issues relating to our proposals (see above), we are keeping an open mind on this issue pending feedback and guidance from SCC Highways.

We were asked about the new entrance to Westdown quarry with local people expressing concerns about its proposed location.

OUR RESPONSE

- Our site access study for Westdown quarry considered seven possible site access options, including two options opening onto the A361. It identified the proposed site access onto the Bulls Green Link Road – a road designed specifically for access to nearby quarries – as the most suitable and safest option for all road users.
- The new access is being designed to fully comply with existing national and local road safety standards and guidance and, again, our proposals are subject to ongoing discussion and approval with the local highways authority, SCC.

We were asked about our plans for bridleways and if we would consider amends.

OUR RESPONSE

- Our proposals have been designed in a way that will allow the continued use of the Public Rights of Way (PRoWs), with Footpath SM 8/11, and Bridleway FR 12/43 sustaining no direct effects.
- Bridleway SM 8/9 will remain open but, for the period of the proposed Asham Wood restoration works between years 3–15 of resumed operations, our proposals include a temporary supplementary crossing point to allow quarry vehicles to cross between the main Westdown quarry to the Asham Wood void. The crossing will require the construction of an electronically controlled crossing point and associated corral area for horses with the design prioritising the safety of both horses and riders.
- We are willing to consider improvements and additions to the existing PRoW and bridleway network on our land within the Asham Wood and will work with local stakeholders to understand more about how best to enhance recreational use of the area.

We were asked if there would be more trains at Whatley as a result of Westdown reopening.

OUR RESPONSE

- Transporting material by rail is limited by capacity availability on the rail network and at present there are no plans for additional volumes to be transported from Whatley by rail. However, as part of our 2030 commitments, the cornerstone of our sustainability strategy, we are committed to reducing the CO_2 emissions from downstream transportation (the transportation of materials from our sites to customers) by at least 15% compared to 2019. Consequently, as we work to reduce our carbon footprint, we would seek to increase the use of rail wherever feasible.

- Our internal analysis has calculated that transporting a tonne of material by rail, instead of by road, cuts the associated CO_2 emissions by around two thirds. For example, our calculations indicate that the CO_2 associated per tonne per kilometre transported by road is 0.168 CO_2 /t-km, whereas for rail it is 0.058 CO_2 /t-km.

Response to feedback

3. The need for quarry materials and the low-carbon agenda

We were asked how expanding mineral extraction can be compatible with the country's low carbon aims.

OUR RESPONSE

- Quarrying is recognised at the highest level of Government as being a vital industry, which supports UK construction and the national economy. In fact, the Government's current Build Back Better campaign sets out its plans to support growth through significant investment in infrastructure, skills and innovation; to pursue growth that levels up every part of the UK and to enable the transition to net zero. For this to be successful, the construction industry must have a ready and consistent supply of raw materials – which the quarrying industry supplies. Without this, the construction sector would need to import supplies, which would not only have an economic disbenefit but would also increase carbon impacts through unnecessary transportation. In summary, the UK's journey to net zero carbon requires essential minerals and mineral products, sourced locally and extracted responsibly.

We were asked why, in addition to other planned quarry extensions in the East Mendips, Westdown also needs to reopen.

OUR RESPONSE

- Understandably, we can't comment on our competitors' business strategies. For Hanson, our approach is based on working sustainably to secure the supply of aggregate to both local markets as well as to nationally significant infrastructure projects.

- Our aim is to take advantage of Westdown's location, close to key road routes, to supply local demand. At our neighbouring Whatley quarry this will enable greater use of the rail link to supply national markets, including to important infrastructure projects such as Hinkley Point C nuclear power station in Somerset and the High Speed 2 (HS2) rail link. Together, these steps will cut our carbon footprint and reduce the impact of quarry HGV traffic on neighbouring villages. (NB: The rail link at Whatley means that this quarry is only one of a handful across England that has the capacity to supply wider UK markets, including markets in London and the south-east of England, where geology dictates that most crushed rock requirements must be met by material from other English regions. Being able to supply these markets by rail means that Whatley quarry is considered by SCC, in its adopted Minerals Local Plan, as a strategic aggregate quarry.)

- Planning permission for the extraction of minerals at Westdown quarry is already in place. Thus, the principle of extraction is established and the consolidating planning submission for the Proposed Development is not required to demonstrate a clear need (in landbank terms) for the mineral – indeed, the consented reserve at Westdown is already accounted for in SCC's calculation of the aggregates landbank.

- Our ES considered the cumulative impact of mineral extraction resuming at Westdown and concluded that no significant 'in combination' effects are anticipated in respect of the environmental issues covered in the ES. Additionally, our proposals for Westdown do not seek to increase the footprint of the quarry, but to resume and complete the working while providing a progressive and final restoration for the site. Consequently, our ES sets out that no significant cumulative effects would occur with other similar sites in the area.

WHAT HAPPENS NEXT?

We hope that this answers many of the queries the local community had about our proposals to update existing planning consents for Westdown quarry.

Further updates on the progress of our planning application will be provided to our Whatley and Westdown Community Liaison Group and the minutes of these meetings are posted to our website: www.hanson-communities.co.uk/en/whatley-and-westdown-quarry-community-page

The Mineral Planning Authority – in this case Somerset County Council (SCC) – has now completed its own public consultation on our proposals and we are expecting a determination of our planning application this autumn.

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WHATLEY AND WESTDOWN COMMUNITY WEBSITE

www.hanson-communities.co.uk/en/whatley-and-westdown-quarry-community-page

Appendix B
Hanson Asham Wood Woodland Management Plan

(Asham Wood)

Date (from/to)	February 2015 – February 2025
Date of last review [UKWAS 2.1.3]	2000
Owner/tenant	Hanson Quarry Products Europe Ltd.
Agent/contact	Alexandra Pick, Landscape Architect, Hanson Quarry Products Europe Ltd. Mob: 07970 703912 email: Alexandra.Pick@hanson.biz
Signed declaration of tenure rights and agreements to public availability of the plan [UKWAS 1.1.3/1.1.5/2.1.2]	

1 Background information

1.1 Location (Map 1 A85m/17)

Nearest town, village or feature	Asham Wood is situated in the eastern Mendip hills, 7 kilometres to the south-west of Frome in Somerset in the parish of Downhead (see Map 1). The villages of Leigh on Mendip, Downhead, Chantry, Leighton and Nunney lie within a 1-2 km radius of the woodland edge. The main A 361 between Shepton Mallet and Frome runs several hundred metres to the south of the wood. The nearest road access point is ST 711 467, approximately 0.2 km south-west of Rock House Farm, Bulls Green, near Chantry.
Grid reference	ST 706 454 (centroid)
Total area (ha)	The total area covered by this plan is 172.30ha.

1.2 Description of the woodland(s) in the landscape (Map 2 A85m/18)

140.6 ha of Asham Wood falls within the Mendip Woodlands Special Area of Conservation (SAC). It is the largest and most diverse of the ancient semi-natural woods in the Mendips. 132.3ha remains wooded but part of the site, to the east, was previously stripped of soils for quarry development, but has regenerated to birch and willow secondary woodland, all over 10 years old.

Asham Wood occupies two relatively small deep valleys (at the northern and southern ends of the site) and the intervening plateau. The site overlies mainly calcareous Carboniferous Limestones and Shales with more acidic Devonian Portishead Beds outcropping along the northern valley. Here more acidic soils have developed and support woodland of a different character to the rest of the site, namely a higher proportion of sycamore *Acer pseudoplatanus*, oak *Quercus robur* and beech *Fagus sylvatica* in the canopy (the latter probably planted) and a field layer characterised by bracken *Pteridium aquilinum*, creeping soft-grass *Holcus mollis*. The soils are mainly free-draining clay loams though permanently wet conditions are present in places, particularly along stream sides.

The surrounding land is mainly farmland but with the neighbouring quarry area of Merehead (Torr Works), to the south (owned by Aggregate Industries) and Asham Quarry and Westdown quarries to the east (owned by Hanson UK).

Asham Wood has two points where it links to other areas in the woodland ecological network: at the southern tip along the edge of Merehead quarry (Torr works) to Monk Wood; and in the north-eastern corner to the woods around Whatley Quarry.

1.3 History of Management (Map 3 A85m/19)

Historical evidence suggests that Asham Wood was replanted extensively with oak in the 19th Century, and from the current lack of more mature standards, the woodland may have been clear-felled at this time. A coppice with standards management continued into the 20th Century, dying out in around 1950 following large-scale post-war coppicing for charcoal. Woodland management then virtually ceased until 1974, when the SWT began woodland management in the reserve leased to them by Hanson UK in Compartment 15.

Quarrying on a small scale has been carried out at this site, perhaps since Pre-historic times, and several remains of Medieval Quarries can still be found. In the 20th Century the scale of quarrying increased and an estimated area of 21.3 hectares of the wood was lost to mineral working.

In 1984, an area of around 6 hectares was felled and stripped above and to the west of Asham Quarry, in preparation for mineral extraction which never took place. Hanson UK (formerly ARC Ltd.) purchased the site in 1985 and since that time, no further quarrying has taken place.

Following stripping operations and on completion of the mineral extraction at the north-eastern corner of the woodland, an adjacent area of excavated quarry was filled with waste. This tipping operation was carried out by Somerset County Council within parts of Compartment 25 and 11 in the 1970s, and was subsequently covered with overburden and woodland soil. These operations caused changes to the original land-form and drainage and resulted in the creation of a large pond in Compartment 11. Some tree planting was carried out on the filled area, but much of the vegetation has arisen from natural regeneration. This block of land in Compartment 11 has subsequently developed into a mosaic of scrub and grassland habitats, supporting a diverse invertebrate community.

Since the mid-1980s, coppice management has been reintroduced to several isolated blocks in the core of the northern woodland area, on individual felling licences. The majority of cut wood is extracted and used as firewood. Re-instatement of management of some of the rides for access and nature conservation has also been carried out, partly under agreement with Natural England. This ride management includes elements of widening, mowing verges and hard-surfacing.

A shoot has used Asham Wood for a number of years for raising and releasing pheasants and their requirements have helped with the reintroduction of ride opening and coppice restoration since circa 1990.

Because of damage to the growth of coppice regeneration and tree seedlings, ongoing management to control the number of roe deer has been carried out, especially since 1991.

The woodland, particularly the area formerly leased to the Somerset Wildlife Trust (see below) and the section with the public right of way along Asham Water, is used for enjoyment by walkers. The adjacent quarry and some of the rides and tracks show signs of continuing illegal use by motor vehicles.

Previous Management Plans

Asham Wood, in particular the approximately 140 ha that lies within the SAC, was the subject of a Management Plan in 1998, prepared by the consultancy Greenwood Environmental. This plan covered the period from 1999 to 2004 and restored a coppice with standards management regime on the plateau and areas of non-intervention on the steeper slopes.

The Somerset Wildlife Trust began a programme of woodland management in 1974 in Compartment 15, following a Summary Management Plan drawn up by the Trust in 1998 (Cousins, M. 1998). This comprised coppicing of hazel on the slopes and also clearance of the open ride or main track into the reserve. This area reverted back to Hanson management in 2001.

Both these plans are now out of date and will be replaced by this current EWGS Management Plan (see below).

There is an active felling licence 018/454/11-12 to carry out coppice with standards in Compartment 10 and a Forestry Commission English Woodland Grant Scheme (EWGS) Contract Number 29949 is now in operation. The EWGS includes additional areas to be brought into management which were not included in the original management plan (Cmpts 26-28) and lie outside the designated SSSI/SAC.

The management practices used in the past will be continued and carried forward through the WPG Management Plan.

2 Woodland Information

2.1 Areas and features (MAP 4 A85m/20)

Designated Areas	Map No.	In Woodland	Adjacent to woodland
Special areas for conservation (SACs)		YES	YES
Special Protection Areas (SPAs)		NO	NO
Ramsar Sites (see note on Guidance)		NO	NO
National Nature Reserves (NNRs)		NO	NO
Sites of Special Scientific Interest (SSSIs)		YES	YES
Other designations (e.g. National Park (NP) / World Heritage Site)		NONE	NONE
Areas of Outstanding Natural Beauty (AONBs)		NO	NO
Local Nature Reserves (LNRs)		NO	NO
TPO / Conservation Area (CA)		NO	NO

The majority of the site (140.6 hectares) is a Grade 1 Site of Special Scientific Interest (SSSI) and is included within the Mendip Woodlands Special Area for Conservation (SAC: Site Code – UK0030048). The qualifying features for the SAC are H9180 – *Tilio-Acerion* Forests of slopes, screes and ravines; **mixed woodland on base rich soils.**

The original area of notification was reduced following quarrying activity from 195 hectares.

A description of the SAC (Site Code UK00 30048) and the conservation objectives for the site are included in Appendix 1.

Rare and important species	Map No.	In Woodland	Adjacent to woodland
Red Data Book or BAP species		YES	YES
Rare, threatened, EPS or SAP species		YES	YES

A dossier of biological records was compiled for the site in the mid-1980s and includes records up to 1985. This was updated in 1999. A full species list is included in Appendix 2, taken from the Asham Wood SSSI Management Plan 1999 – 2004 (Greenwood Environmental). There are no specific map locations known for these species, apart from the habitat and species descriptions included in Section 2.2 *Woodland Resource Characteristics.*

The following rare and notable species, all restricted to ancient woodland sites, were located within Asham Wood in the 1999 survey: Herb Paris *Paris quadrifolia;* Solomon's seal *Polygonatum multiflorum;* Lily of the Valley *Convallaria majalis;* Toothwort *Lathrea squamaria;* Yellow archangel *Lamiastrum galeobdolon.*

The nationally rare narrow-leaved bittercress *Cardamine impatiens* is of special interest while other notable species include columbine *Aquilegia vulgaris*, adder's-tongue *Ophioglossum vulgatum*, wild daffodil *Naricissus pseudonarcissus*, small teasel *Dipsacus pilosus*, common spotted orchid *Dactylorhiza fuchsii*, broad-leaved heleborine *Epipactis helleborine*, early purple orchid *Orchis mascula*, water avens *Geum rivale*, nettle-leaved bellflower *Campanula trachelium* and hybrid avens *Geum x intermedium*. The widespread occurrence of meadow saffron *Colchicum autumnale* is typical of East Mendip woods but unusual nationally. Historical species records for this site include hairy spurge *Euphorbia pilosa* and yellow vetch *Vicia lutea*, plants which are now thought to be extinct in Somerset.

The generally sheltered and humid conditions provide an ideal environment for a wide range of lower plants including 114 species of moss, including the nationally scarce *Bryum creberrimum*, and 21 species of liverwort have been recorded. These bryophytes are most often associated with mature tree trunks and exposed rocks and soil. Well over 100 species of fungi occur, including rare species such as oak polypore *Buglossopones pulvinus.*

European Protected Species include the dormouse (*Muscardinus avellenarius*) may be present although there are no recent records. Periodic surveys for dormouse, however, using both nest tubes and nest boxes, have failed to confirm the presence of this species within the northern area. Recent surveys (October 2014) where surveyors from the Somerset Wildlife Trust (SWT) and University of the West of England (UWE) carried out nut searches

under hazel coppice, also failed to confirm the presence of this species. Greater horseshoe bat (*Rhinolophus ferrumequinum*) have been recorded on site. SWT will carry out further surveys for Dormouse in other areas of the wood in 2015.

A known roost for the greater horseshoe bat frequents an old conveyor tunnel which is a short distance outside the SAC boundary. An OS Grid Reference is available for the roost but this information is of a confidential nature. It can be assumed that it uses the woodland as a commuting route and foraging habitat. A variety of bat species are known to use the site and most probably use veteran trees within the woodland as roost sites, although no firm roost locations within the woodland itself have been confirmed. SWT will be carrying out further surveys of Greater Horseshoe Bats, focused on the wide rides, along potential flight corridors and near to the known roost site. There are plans to install a bat grille over the roost entrance, once the baseline surveys have been completed, and the roost will be monitored regularly in subsequent years.

Breeding birds include buzzard *Buteo buteo*, sparrowhawk *Accipter nisus*, garden warbler *Sylvia borin*, spotted flycatcher *Muscicapa striata*, song thrush *Turdus philomelos*, marsh tit *Parus palustris* and great spotted woodpecker *Dendrocopus major*. Nightingale *Luscinia megarhynchos*, woodcock *Scolopax rusticola*, willow tit *Parus montanus* and lesser spotted woodpecker *Dendrocopus minor* are known formerly to have bred.

The cessation of management in Asham Wood over 60 years ago had a significant impact on woodland invertebrates. Recently recorded resident breeding butterflies include dingy skipper *Erymis tages*, grizzled skipper *Pyrgus malvae*, silver-washed fritillary *Argynnis paphia* and purple hairstreak *Quercusia quercus*. Former breeding species which have not been recorded for some time include pearl-bordered fritillary *Boloria euphrosyne*, small pearl-bordered fritillary *Boloria selene*, wood white *Leptidea sinapsis* and white-letter hairstreak *Strymonidia y-album*. In view of the large size of the woodland (over 400 acres), with the re-instatement of woodland management, re-introduction of woodland butterflies may be possible.

Important moth species which occur in Asham Wood include drab looper *Discoloxia blomeri*, scarce hooktip *Sabra harpagula* and white-pinion spotted *Lomographa bimaculata*.

Other notable invertebrate species to have been recorded at the site are the woodland grasshopper *Omocestus rufipes*, 11 species of diptera, at least 2 of coleoptera and 3 of molluscs, including the mountain bulin snail *Ena Montana*.

Whatley Brook is known to have formerly supported a population of white-clawed crayfish *Austropoptamobius pallipes* but this species is now extinct within the Mells River catchment area. Otter *Lutra lutra* are known to use Whatley Brook and Torr Quarry, with recent sightings and spraint sites in 2014. Otters are known to use adjacent open water areas in Chantry Ponds (recorded as recently as 2013).

All management will be carried out in accordance with the UK Forestry Standard and Forestry Commission Best Practice Guidance for dealing with sites supporting protected species.

Habitats	Map No.	In Woodland	Adjacent to woodland
Ancient semi-natural woodland (ASNW)		YES	YES
Other semi-natural woodland		YES	YES
Plantations on ancient woodland sites (PAWS)		NO	NO
Semi-natural features in PAWS			
Woodland margins and hedges		YES	YES
Veteran and other notable trees		YES	
Breeding sites		**YES**	
Habitats of notable species		YES	
Unimproved grasslands		YES	NO
Rides and open ground		YES	YES
Valuable wildlife communities		YES	YES
Feeding area		YES	YES
Lowland heath		NO	NO
Peatlands		NO	NO
Others			

The bulk of Asham Wood is typical of the *Fraxinus excelsior – Acer campestre – Mercurialis perennis* type of woodland community (NVC W8). It is the best example of this community in Somerset, and possibly in the UK. There is much variety within this community with six of the seven sub-communities of W8 woodland present, although some are represented by only very small stands. At the northern end of the site, where more acidic soils are present, parts of the woodland are more typical of the *Quercus robur – Pteridium aquilinum – Rubus fruticosus* community (NVC W10), typically the W10e *Acer pseudoplatanus – Oxalis acetosella* (Sycamore – Wood Sorrel) sub-community.

Most of the veteran and notable trees are multi--stemmed ash stools and stub pollards, but a veteran yew *Taxus baccata* is present located within Compartment 21. There is also a veteran sweet chestnut *Castanea sativa* tree on the north side of the ride in Compartment 1. Some mature small-leaved lime *Tilia cordata* specimens can be found within the southern woodland block, particularly along the eastern margin. All veteran and future veteran trees will be identified, mapped and managed to maintain their local micro-climate, while ensuring that they receive enough light to maintain their existing crowns and vigour.

Wetland habitat and neutral flushes occur along the valley bottoms, associated with the permanently waterlogged soils of the lower slopes. These waterlogged streamside areas in the north of the site support small stands of *Alnus glutinosa – Fraxinus excelsior – Lysimachia nemorum* woodland community (NVC W7).

Water	Map No.	In Woodland	Adjacent to woodland
Watercourses		YES	YES
Lakes			
Ponds		YES	YES
Wetland habitats		YES	YES

There are two main watercourses in Asham Wood. Whatley Brook flows in a north-easterly direction through a steep weathered limestone gorge on the eastern margin of the site, from around 150m above mean sea level at the southern end of the site where it emerges from a culvert. This watercourse has the remains of an alluvial floor, but the banks for much of its length have been altered or disturbed by quarrying operations. At the north-western and northern ends of the site the land drains westwards and northwards to the Shearmoor Stream which flows away eastwards, under the Bull's Green link road and into Whatley Brook. This watercourse flows away to Chantry Pond in the north-east, then becoming Fordbury water which joins the Mells River which then flows into the River Avon.

In the north-eastern corner of Asham Wood (Compartment 11) is a relatively large pond which is beginning to develop a diverse flora and fauna. Patches of dense aquatic weed, are dominated by Canadian pondweed *Elodea canadensis*, but there is a diverse invertebrate fauna with a range of molluscs, beetles, dragonflies and crustaceans. This pond was formed when the valley to the north was filled with waste and covered with overburden and woodland soils. There is also a small marshy area on the eastern side of the pond with a flora dominated by plants of the lesser pond sedge *Carex acutiformis*, but also containing frequent yellow flag *Iris pseudocorus*, brooklime *Veronica beccabunga* and water mint *Mentha aquatica*. There is a small pond at the north-eastern end of Compartment 4, in an area where the vegetation and top soil were stripped and then abandoned. This pond has no vegetation.

There are several springs in an around the site, most notably Buckenham's Well in Compartment 16. Despite the underlying calcareous rocks of the woodland, the spring water carries relatively little calcium, emerging after flowing through the mainly older adjacent volcanic rocks.

Riparian zones will be managed to achieve 50% dappled shade over the watercourses, and to control leaf-fall into ponds, subject to any more specific advice from Natural England. All wet areas, including springs and flushes, will be protected from damage during operations.

Landscape	Map No.	In Woodland	Adjacent to woodland
Landscape designated areas		NO	NO

Landscape features		YES	YES
Rock exposures		YES	YES
Historic landscapes		YES	YES
Areas of the woodland prominent from roads		YES	
Areas of the woodland prominent from settlements		YES	

Much of the plateau at the northern end of the wood was cleared in the prehistoric period. Significant landscape history interest lies along the western side of the northern woodland block where an open stone-lined leat and a later ceramic-lined culvert run along the north-south footpath. These leats, in turn, supplemented the natural spring water from Buckenham's Well to help feed Chantry Pond, a water reservoir for the iron works in Chantry. Buckenham's Well is also an important historical feature, being referred to in 17th Century documents.

In several places within Asham Wood, particularly along the western margin, the remains of small Medieval quarries occur. These quarries highlight the ancient, as well as the continuing use of the Mendips for mineral extraction. Many of the trackways which pass through the woodland may date from this time or even earlier.

Asham Wood forms a very important landscape feature in this area and there is significant interest in the richness of the wildlife, landscape and history of the site from local people.

Cultural features	Map No.	In Woodland	Adjacent to woodland
Public rights of way		YES	YES
Prominent viewing points		NO	NO
Existing permissive footpaths		NO	NO
Proposed permissive footpaths		NO	NO
Areas managed with traditional management systems		YES	YES

The footpaths and bridleways that pass through Asham Wood are historical features in their own right, and are nowadays used by a small number of walkers. One of these footpaths has been designated as part of the long distance route – the East Mendip Way. There is a north-south footpath in the western side of the northern woodland block, associated with the leat. This section of the current footpath, which also passes along Crab Tree Lane to the north, was formerly of much greater importance, forming part of the route of the former main road between Shepton Mallet and Frome.

The function of a feature comprising 2 dams which form a small pool on the northern stream is not clear but may have been used in association with woodland management e.g. soaking hazel wands, or as an attempt to attract water fowl for hunting.

Mendip woodlands are known to have supplied Henry III with red deer harts and hinds in the 13th century, but in more recent times, have generally been managed to provide the raw material for a wide range of wood and timber products for local consumption. These included charcoal for domestic and industrial use, and timber for use in the mines of the Somerset coalfield. Predominantly, Asham Wood was coppiced to supply poles of various diameters and lengths. In the 19th century, coppice material from Asham Wood was used by a local firm at Leigh-on-Mendip for spade and rake handles. The standard trees yielded larger dimension timbers for construction purposes, while the waste material and intermediate sizes were mainly used for making charcoal, predominantly for lime-burning, or for firewood.

The coppice regeneration programme was recommenced in the heart of the remaining area of the northern woodland block of Asham Wood by Hanson UK (formerly ARC Ltd) in 1988, although traditional management was re-introduced in the 1970s when the Somerset Wildlife Trust leased approximately 13.35 ha of the western margin (Compartment 15) of the wood. This leased expired in 2001.

Archaeological Features	Map No.	In Woodland	Adjacent to woodland
Scheduled monument		NO	NO
Historical feature (Inc. designed landscapes, registered parks	6	YES	YES

and gardens)			
Other		YES	

Although there are no Scheduled Ancient Monuments (SAMs) or Registered Landscapes within the wood, the site contains a number of historical features of some interest. The historical features are listed and mapped on Somerset County Council's Historic Environment Record (HER); an extract from Asham Wood is included as Map 6. Management recommendations were received from Jan Groves following a site visit, the details of which can be found in Appendix 3.

The remains of Bronze Age barrows and prehistoric, Roman and medieval buildings and enclosures occur throughout the northern end of the wood. Recent surveys have also established the location of prehistoric/Roman earthworks at the northern edge of Castlehill Wood with an associated ancient trackway heading southwards to a ford in the stream which flows eastwards through the northern woodland margin.

2.2 Woodland resource characteristics

Cpt	Predominant Woodland Landuse	NVC category/species	Planting Year (Approx)	Area HA[1]	Ground flora/ Understorey	Comments[2]
1	ASNW	Mosaic of W8e/W10e with smaller patches of W8f Ash, field maple, oak, sycamore	Pre 1600	7.50	Hazel, privet, dogwood, spindle Dog's mercury, herb robert, wood anemone, ivy, ramsons (on flushed alkaline slopes); bracken and bramble on more acidic soils. Rich in uncommon woodland plants and fungi	No obvious signs of recent management, comprising oak and ash derelict coppice. **Prescription:**Management in two coupes – east in year 3 and west in year 21. Thinning & singling of some of the larger oak and ash coppice re-growth. Riparian Zone management of coppice with standards in Year 6. Ride widening/scalloping of southern boundary between Cpts 1 & 10 while retaining a 50m wide minimal intervention zone[3] along the southern edge.
2	ASNW	Mainly W8a with small patches of W10e and W7c Ash, field maple, oak, sycamore, alder	Pre 1600	4.75	Hazel, privet, dogwood, spindle Dog's mercury, ground ivy, primrose on alkaline soils with large stands of wild daffodil – generally rich in uncommon woodland species ; bracken and bramble on acidic soils, yellow pimpernel along waterlogged streamsides.	Two blocks of coppice-with-standards management in 1997, 1998/99. **Prescription:** Riparian zone management (north) in year 2; Re-introduce coppice-with-standards to bulk of compartment in year 19 (south) and year 20 (north). Retain canopy links along northern and eastern boundaries (minimal intervention zone).
3	ASNW	Largely W8a, with small	pre 1600	4.25	Hazel, privet, dogwood, spindle	Derelict coppice-with-standards, with few large

[1] Hectarage is given for the whole compartment.

[2] Recruitment will be solely by natural regeneration throughout all coppice coupes

[3] Minimal intervention zones may be subject to a one-off thinning to waste management, as required, to improve age structure and diversity.

		patches of W8f Ash, field maple,			Dog's mercury, ground ivy, primrose, ramsons, uncommon woodland plants present including large stand of meadow saffron; columbine along central ride.	standards and no signs of recent management. **Prescription**: Re-instate coppice-with-standards in 2 coupes; north in year 6 and south in year 23.
4	ASNW	W8a Ash, field maple, oak	pre 1600	2.25	Hazel, privet, dogwood, spindle Dog's mercury	Derelict coppice with few larger standards. No signs of recent management. **Prescription:** Re-instate coppice-with-standards to bulk of compartment in year 17. Create open woodland at south-eastern corner of the northern management block and links to the stripped area on its southern and eastern boundaries. Management will allow increased light into the north and west of the block enabling species movement/re-colonisation. Ride widening & scalloping between Cpts 3 & 4.
5	ASNW	W8a Ash, field maple, oak	pre 1600	4.25	Hazel, privet, dogwood, spindle Dog's mercury	Coppice-with-standards re-introduced in 1990, 1992 and 96/97. **Prescription:** Re-instate coppice-with-standards in two coupes; west in year 15 and east in year 16
6	ASNW	Largely W8a with a small area of W8c Ash, field maple, oak	Pre 1600	6.00	Hazel, privet, dogwood, spindle Dog's mercury, tufted hair-grass. Rich diversity of uncommon woodland plant species, including columbine along the northern ride.	Derelict coppice woodland, with some larger standards. Coppice-with-standards was re-introduced to a small block in 1993 and to a larger block in 1997/98. **Prescription:** re-instate coppice-with-standards in two coupes; west in year 6 and east in year 12.
7	ASNW	W8a Ash, field maple, oak	pre 1600	4.25	Hazel, privet, dogwood, spindle Dog's mercury, ground ivy, primrose. Uncommon woodland plants present including wild daffodil.	Coppice-with-standards re-introduced to compartment in 7 coupes in 1993, 1994, 1995/96, 1999/2000 and 2000. **Prescription:** re-instate coppice with standards to majority of compartment in year 22. Retain 50m wide minimal-intervention strip along western margin.

8	ASNW	W8a Ash, field maple, oak	Pre 1600	3.75	Hazel, privet, dogwood, spindle Dog's mercury, ground ivy, primrose.	Coppice-with-standards re-introduced in 3 blocks in 1991, 1992 and 1996, but remainder is derelict coppice with few standard trees. **Prescription**: re-instate coppice-with-standards to entire compartment in two coupes; the middle block in year 8 and the north & south blocks in year 18.
9	ASNW	W8a Ash, field maple, oak	pre 1600	3.75	Hazel, privet, dogwood, spindle Dog's mercury, ground ivy, primrose.	Coppice-with-standards re-introduced in 4 blocks in 1990, 1994 and 1995. Remainder is derelict coppice with few standards. **Prescription**: Re-instate coppice-with-standards to all of compartment in two coupes; south block in year 13 and north block in year 14.
10	ASNW	W8a Ash, field maple, oak	pre 1600	4.75	Hazel, privet, dogwood, spindle Dog's mercury, ground ivy, primrose.	Coppice-with-standards re-introduced into bulk of compartment under current felling licence (2012-2017). Earliest management in 1989. **Prescription:** re-coppice whole compartment, working west to east, commencing year 25+.
11	ASNW	W8a (and wooded pond) Ash, field maple, oak, silver birch, sallow	Pre 1600	2.75	Hazel, privet, dogwood, spindle, sallow Dog's mercury, ground ivy, primrose Wetland flora on eastern pond margin.	Coppice with standards re-introduced in 1 block in 2004/05. Rest of Cpt derelict coppice-with-standards, some very large. Silver birch locally dominant and large sallows around pond. **Prescription:** Thinning to south and south-east of pond to be carried out in year 11, allowing dense low scrub to develop along these margins. Re-introduce coppice-with-standards to rest of compartment in year 24.
12	ASNW	W8a Ash, field maple, oak, small-leaved lime	Pre 1600	2.50	Hazel, privet, dogwood, spindle Dog's mercury, ground ivy, primrose.	Derelict coppice-with-standards in southern management block. **Prescription:** re-instate coppice-with-standards to bulk of compartment in year 5, retaining 50m wide strip of minimal-intervention

						woodland along the western margin
13	ASNW	Largely W8a with W8d along the southern and eastern margins; small patches of W8f Ash, field maple, oak, small-leaved lime	pre 1600	6.50	Hazel, privet, dogwood, spindle Dog's mercury, ground ivy, primrose, ivy, ramsons. High presence of uncommon woodland plants.	Derelict coppice-with-standards in southern management block. **Prescription**: re-instate coppice-with-standards to bulk of compartment in two coupes; southern block in year 9 and northern block in year 10. Retain 50m wide strip of minimal-intervention woodland along the western margin.
14	ASNW	W8a Ash, field maple, oak, small-leaved lime	pre 1600	2.75	Hazel, privet, dogwood, spindle Dog's mercury, ground ivy, primrose. Uncommon woodland plants present.	Derelict coppice-with-standards in southern management block. **Prescription**: Re-instate coppice-with-standards to bulk of compartment in year 2, retaining 20-50m wide strip of minimal-intervention woodland along the western margin.
15	ASNW	Mosaic of W8a and W8b with patches of W8e and W8f Ash, field maple, oak, sycamore	pre 1600	13.25	Hazel, privet, dogwood, spindle Dog's mercury, ground ivy, primrose, wood anemone, herb robert, ramsons	Previously managed as coppice-with-standards by SWT in a 10 year coppice cycle, commencing in 1974/5 and ceasing in 2001. **Prescription**: Re-instate coppice-with-standards management in a small coupe in year 4, retaining western, narrow southern strips as minimal-intervention woodland.
16	ASNW	W8a/W10e (50/50 mosaic) and part W10e with small patches of W7c and W8f Ash, field maple, oak, sycamore, alder	pre 1600	2.75	Hazel, privet, dogwood, spindle Dog's mercury, ground ivy, primrose, ramsons, wood sorrel, tufted hair-grass, yellow pimpernel	Derelict coppice-with-standards **Prescriptions:** Riparian zone management and thinning in year 1, while retaining minimal-intervention zone in western block.
17	ASNW	W10e stand with large patches of W8e Oak, ash, field maple, sycamore, beech	pre 1600	4.50	Hazel, privet, dogwood, spindle Dog's mercury, ground ivy, primrose, wood sorrel,herb robert Bracken, bramble	Shearmoor wood: a relatively open woodland compartment formerly managed as coppice-with-standards **Prescription**: Manage to achieve minimal-intervention high forest by creating clearings,

						leaving trees as they fall.[4]
18	ASNW	W8a Ash, field maple, oak,	Pre 1600	1.75	Hazel, privet, dogwood, spindle Dog's mercury, ground ivy, primrose.	Boddenham's Coppice: Derelict coppice woodland **Prescriptions:** Non-intervention but some clearance likely to take place for footpath management.
19	ASNW	W8a with mosaic of W8a/W10e with small patches of W8d Ash, field maple, oak, sycamore	pre 1600	3.75	Hazel, privet, dogwood, spindle Dog's mercury, ground ivy, primrose, wood sorrel, ivy	Derelict coppice-with-standards. **Prescription:** Manage to achieve minimal-intervention high forest by creating clearings, leaving trees as they fall. See footnote 4.
20	ASNW	W8a Ash, field maple, oak	Pre 1600	1.00	Hazel, privet, dogwood, spindle Dog's mercury, ground ivy, primrose. Uncommon woodland plants present.	Derelict coppice woodland with some older standards. **Prescription:** Manage to achieve minimal intervention high forest by creating clearings, leaving trees as they fall. See footnote 4.
21	ASNW	W8a with small patches of W8b and W8d Ash, field maple, oak, alder	Pre 1600	7.50	Hazel, privet, dogwood, spindle with abundant ash seedlings in field layer Dog's mercury, ground ivy, primrose, wood anemone, ivy, ramsons, bluebell, meadow saffron, wild daffodil	Managed by coppicing in the past. Few larger standard trees and veteran yew present. **Prescription:** Manage to achieve minimal-intervention high forest by creating clearings, leaving trees as they fall. See footnote 4.
22	ASNW	W8a and W8b with patches of W8e and W8f Ash, field maple, oak	pre 1600	10.00	Hazel, privet, dogwood, spindle Dog's mercury, ground ivy, primrose, wood anemone, woodsorrel, enchanter's nightshade, ground ivy, herb robert, ramsons. High diversity of uncommon woodland plant species.	Narrow compartment of derelict coppice woodland with some larger standard trees. **Prescription:** Minimal-intervention. This compartment forms a vital link between the northern and southern woodland blocks. See footnote 4.
23	ASNW	Mosaic of W8e, W8d, W8f and W8b	Pre 1600	12.00	Hazel, privet, dogwood, spindle Dog's mercury, herb robert, ivy, ramsons, wood anemone.	Formerly managed as coppice-with-standards woodland, but few larger standard trees

[4] Minimal-intervention compartments will aim to maintain High Forest with natural clearings and both standing and fallen dead wood habitats.

		Ash, field maple, oak, small-leaved lime, yew			Many uncommon woodland plants present.	remain. **Prescription**: Minimal- intervention to allow development to high forest by creating clearings & leaving trees as they fall. See footnote 4.
24	Stripped Area/Secondary woodland	Birch scrub	c1971	9.00	Violet, wild strawberry. Ground flora is rich in calcareous species where topsoil was not fully removed.	Following stripping, secondary birch woodland is developing on rocky substrates. **Prescription**: Minimal intervention allowing natural succession to continue. Possibility of opening up and maintaining calcareous grassland where it occurs
25	Quarry Waste Tip/Secondary woodland	Birch	C1971	7.00	Birch secondary woodland. Sparse field and ground flora.	**Prescription**: Minimal intervention/thin to waste in year 11 to allow natural succession to continue.
26	Quarry/Secondary woodland	Remnant of ASNW, outside SAC	Pre 1600	14.05	Some ASNW species present but highly disturbed.	**Prescription**: Minimal intervention/thin to waste in year 11/12 to allow natural succession to continue.
27	Quarry/Secondary woodland	Birch	c1971	20.75	Birch secondary woodland. Sparse field and ground flora.	**Prescription**: Minimal intervention/thin to waste in year 11 to allow natural succession to continue.
28	ASNW	Remnant woodland	Pre 1600	5.00	ASNW species present	**Prescription**: Minimal intervention/thin to waste in year 11 to allow natural succession to continue.

2.3 Site description

Soil

The underlying bedrock is site mainly calcareous Carboniferous Limestone and Lower Limestone Shales with more acidic Devonian Portishead Beds of Old red Sandstone outcropping along the northern coombe margin. The soils are neutral to strongly alkaline over the limestone, but mildly acid over the Devonian beds. They include a wide range, from excessively drained skeletal soils on the limestone outcrops, to freely-drained clay loams with a degree of flushing along the lower slopes of the valleys. The soils along the stream sides are permanently wet. Past quarrying activities have resulted in areas where topsoils and overburden have been stripped, and in places the ground has been made up with quarry waste material.

Topography

The larger northern block of wood lies on a flat plateau at a height of approximately 180m AOD, falling away to small coombes in the north and west. The smaller southern woodland block has an elevation of around 175-185m AOD, with the land falling away steeply to Whatley Brook.

Climate

The climate of the Mendip Hills consists of generally mild winters and summers which range from cool and wet to hot, dry and sunny. The average annual rainfall is 1124mm (between 1961-1990 measured at Downhead, Green Farm monitoring station).

Access

There are two public footpaths that pass through the wood. One comes in from the village of Chantry and runs through Shearmoor Wood, south to the village of Downhead. The second public footpath follows the north-south course of Whatley Brook, running the length of the site's eastern boundary, with a branch heading north-west along the boundary of Torr Works

Other tracks and footpaths within the woods have been used historically by a small number of walkers, and there is a problem of illegal use of some of the tracks and woodland areas by motorbikes.

Boundaries

The boundaries of the site are largely fenced where they are adjacent to agricultural land and also where the site boundary runs alongside Merehead Quarry in the south. However, access is possible into the wood via the public footpaths and also through Westdown Quarry on the eastern boundary.

2.4 Significant hazards, constraints and threats

The sheer quarry faces and steeply sloping valley sides are a major constraint to management due to difficulties with access.

High numbers of roe deer causes extensive damage to newly coppiced trees, particularly the veteran ash pollards, and several stools have been lost in the past.

Illegal use of tracks and paths within the woods has caused severe erosion to existing track ways and damaged woodland ground flora. Vehicles have been abandoned and set alight in the wood which causes local damage

to the ancient woodland habitats.

Run-off from the quarry works in the south west has resulted in silt being deposited on woodland ground flora.

Agricultural run-off from adjacent farmland into Shearmoor wood (Cpt 17) causing eutrophication and vegetation impacts.

Ash die-back *Chalara fraxinea* disease may pose a major threat to the Mendip ash woodlands and result in a loss of trees and changes to species composition in the long term.

3 Long term vision, management objectives and strategy

3.1 Long term vision

Re-establish rotational coppice with standards over a 25 year rolling program to the northern and southern woodland plateau features, while maintaining significant areas of minimal and non-intervention woodland as High Forest, with natural and artificial creation of gaps in the canopy. Both standing dead wood and fallen dead wood will be left in situ to enhance biodiversity and the significant nature conservation value of the woodland will be maintained and enhanced.

In the minimal and non-intervention areas, trees will be allowed to develop to veterans.

3.2 Management Objectives

No	Objective
1	Re-establish rotational coppice with standards on an annual basis
2	Continue and expand management of woodland rides
3	Introduce riparian zone management
4	Maintain areas of minimal intervention, with a one-off thinning to waste carried out as necessary, targeted within areas of woodland that have not received any management for many years
5	Maintain non-intervention areas as High Forest, with the creation of natural gaps in the canopy and leaving standing and fallen dead-wood in situ.
6	Bring areas of remnant and regenerating woodland outside the SAC into management
7	Review biological information through survey and monitoring to ensure that species of nature conservation value are maintained at favourable conservation status.
8	Restrict and aim to eradicate illegal use by motorbikes and 4x4 vehicles.
9	Monitor the woodland for *Chalara fraxinea*

3.3 Strategy

Coppice with standards management will be re-instated on the northern and southern woodland plateaus. Trees and shrubs will be coppiced or re-coppiced. A variety of standards, pollards and stubs will be maintained and existing pollards re-pollarded.

Existing woodland rides will be maintained and enhanced by creation of scalloped edges either side of the ride by coppicing and thinning. Arisings will be used to create habitat piles (logs and brashings) and dead hedging along the edges of the rides.

A programme of riparian zone management will be introduced by felling groups of standard trees to create clearings throughout the compartment, adjacent to the watercourse. Trees will be left where they fall and new pollards of ash/oak will be created in each clearing.

Areas of minimal intervention may undergo a one-off thinning to waste carried out as necessary, targeted within areas of woodland that have not received any management for many years. This will be carried out to improve the structure and age class diversification, with standing dead wood created through ring-barking or chemical treatment. The scrubby woodland around the south and south-east of the pond will be managed to create low scrub as cover for nesting birds. Several larger sallows *Salix caprea* will be retained and allowed to mature to enhance invertebrate biodiversity.

Non-intervention woodland along the site boundaries will be left to maintain important links between the northern and southern woodland blocks. These areas will be managed as High Forest, with the creation of natural gaps in the canopy and leaving standing and fallen dead-wood *in situ*, and allowing trees to develop to veterans.

Areas of remnant and regenerating woodland outside the SAC within the old quarries and waste tip will be brought into management, with a one-off thinning to waste carried out in these areas, as necessary.

The biological information for the site will be updated through survey and monitoring to ensure that species of nature conservation value are maintained at favourable conservation status. This will include the introduction of fixed point photography, and surveys of key species, where appropriate.

Areas of the woodland have been damaged by the illegal use of motor bikes and cars. This has been an ongoing problem and meetings with local representatives and police engagement will allow remedial action to be taken.

Ash die-back disease *Chalara fraxinea* has been identified as a potential major threat to native ash woodlands. It will be important to continue to monitor the woodland for any signs of this disease and take action, where necessary. A newly regenerated stool may be more susceptible to *Chalara* than an over-stood one.

3.4 Woodfuel Initiative

Would you be interested in receiving information on funding opportunities for the purchase of harvesting machinery or wood fuel boilers, or for grants that support timber production from your woodlands?

NO

4 Management prescriptions/operations

4.1 Silvicultural systems

4.1.1 Harvesting

Coppice with Standards (including riparian zone management)

Compartments 1 (riparian zone); 2; 3; 4; 5; 6 ; 7 (part only); 8; 9; 10; 11 (part only, excluding wooded pond); 12 (part only); 13; 14 (part only); 15 (old SWT reserve); 16 (riparian zone). The coppicing programme will be carried out on a rotational basis, targeting areas of derelict coppice in the early years of the plan and aiming to ensure that all stages of woodland succession will be present on completion of the first 25 year rotation.

Riparian zone management in Cpts 1 & 16 will create a series of clearings throughout the compartment of approximately 30m long and 20 wide adjacent to the watercourse, retaining oak standards where present. Small clearings south of the stream will aim to maintain and enhance the area of neutral flush habitat.

Coppice with standards management will single some of the larger ash coppice regrowth, to maintain a maiden stem on veteran stools to ensure their survival. Oak and field maple standards will be thinned to 50/ha in Cpts 8, 12 & 13; 30/ha in Cpt 5 and 20/ha in Cpt 4. However, in view of the ongoing threat from *Chalara* to the Mendip ash woodlands, oak standards may need to be retained, wherever possible.

Coppice with standards management will maintain a variety of standards, pollards & stubs but also re-pollard some of the existing pollarded trees to create 5-6 new pollards of ash, oak & small-leaved lime.

All coppice coupes will be fenced to prevent deer damage.

Ride widening

Compartments 1/10, 3/4, 5/6, 7/8, 5/8

Ride management will create rides of approximately 50m wide with a scalloped edge either side of the ride by coppicing & thinning, creating wide rides showing a succession from grassy edge through to high forest. Arisings (cord wood and brash) will be used to create habitat piles and dead hedging along the ride edges.

Minimal intervention

Compartments 1 (southern edge); 2 (northern & eastern boundaries); 7 (western margin); 11 (part only i.e. wooded pond); 12 (western margin); 13 (western margin); 14 (western margin); 15 (western & southern margin); 16 (western block); 17; 18; 24; 25; 26; 27, 28 will be thinned by singling of coppice stems to favour long-lived upright wind-firm stems. The minimal intervention areas have been designed to maintain the links with adjacent woodland areas in the south and in the north-eastern corner of Asham Wood, while creating a network of undisturbed buffer zones around the woodland perimeter.

Naturally regenerated birch dominated woodland of Cpts 24, 25, 26 & 27 will be thinned by typically 30% to improve the structure and age-class diversification, while allowing natural regeneration to continue in order to maintain ecological networks. Thinning will be phased to avoid damage to the developing woodland structure.

Some thinning will be achieved by ring-barking or chemical treatment to create standing dead wood.

Thinning the woodland to the south & south-east of the pond in Cpt 11 will benefit the freshwater & marsh community. Dense low scrub will be allowed to develop along the southern & south-eastern pond margins as

cover for nesting birds. No more than 20 standards/ha will be retained but some of the larger sallows *Salix caprea* will be retained and allowed to mature to enhance invertebrate diversity.

Non-intervention

Compartments 19, 20, 21, 22

The above non-intervention Cpts will be allowed to revert to High Forest. A managed High Forest may be more appropriate in Cpts 21 & 22, where 6-8 clearings of approximately 20m diameter are created by coppicing all shrubs & felling standard trees in groups of 5-10+. The trees can be left where they fall. One standard tree of ash or oak in each clearing will be pollarded and the clearings should be spaced throughout the compartment.

Harvesting as firewood is primarily a by-product of the low-impact silivicultural system targeted at achieving biodiversity enhancement in this site of high nature conservation importance. No more than 10% of the woodland will be coppiced in any 5 year period, which is within the WPG Operational Guidance for England.

4.1.2 Phased felling and restructuring of plantations

This section does not apply to semi-natural woodlands.

4.1.3 Establishment, restocking and regeneration

There will be no new planting as all recruitment will be by natural regeneration and coppice re-growth. Ash die back disease *Chalara fraxinea* may be an issue so monitoring will establish if stocking density or woodland structure is affected. In view of the ongoing threat from this disease, it may be sensible to propagate some of the minor species and especially the Dutch Elm resistant elms in the wood, doing this at an early stage in the plan, and spread the young trees throughout the woodland blocks, using appropriate deer protection guards. It may also be necessary to retain all the oak standards and protect minor species such as Whitebeam, Crab Apple, Small-leaved lime, Wych Elm and Aspen within the coppice regime.

4.2 New planting

Not applicable. Proposed additions to guidance to clarify consideration of design impacts etc. [UKWAS 3.2.1/3.2.2], to add reference to local native seed zones and FRM regulations [UKWAS 6.3.3]. None proposed except in the event that *Chalara fraxinea* poses a threat and new planting will be carried out with stock collected from Asham Wood, grown on and then replanted

4.3 Other operations

Not applicable. Proposed additions to guidance to clarify consideration of design impacts etc. [UKWAS 3.2.1/3.2.2], to add reference to local native seed zones and FRM regulations [UKWAS 6.3.3].

4.4 Protection and maintenance

4.4.1 Pest and disease management

Roe Deer

There is a high population of roe deer within the woodland and they cause considerable damage to newly regenerating coppice, particularly ash. Deer management has taken place since 1991 on a deer licence issued by Hanson UK. This expired in 2013 and is due for renewal. Where veteran ash stools have been coppiced in the past, there may be a total loss of the stool due to the browsing activity of deer. To prevent this, coppice coupes are deer-fenced. In areas where fencing is difficult due to the nature of the terrain, brush will be piled around newly coppiced stools to give some protection from deer. In addition, when coppicing or re-coppicing veteran ash stools, a single maiden stem, or more if there are youngish stems available, is left to ensure the survival of the stool.

Squirrels

Squirrel damage is not significant in a site as large as Asham Wood. Some sycamore will be retained as sacrificial tree.

Chalara fraxinea

Ash-die back disease is potentially devastating for the Mendip ash woodlands and any signs and subsequent progress of the disease will need to be carefully monitored. In the event of the disease posing a serious threat to these woodlands, seed sources from local unaffected trees can be collected and grown on, then replanted. Current Forestry Commission guidance will be followed.[5]

4.4.2 Fire plan

The woodland is not prone to fire risk due to the local climate as rainfall is relatively high due to the influence on weather of the Mendip Hills. In the event of a fire there is good access for the fire brigade and water can be extracted from the pond.

[5] Confirmed *Chalara fraxinea* infected ash: confirmed via previous site related support to remove infected stock with a Plant Health Woodland Improvement Grant (PH WIG); or photographic evidence of symptomatic trees & photographic evidence linking the symptomatic tree to recognisable feature(s) on the site: or, if one has been issued, a letter from the FC or FERA confirming infection on the site. EWGS 4: Woodland Regeneration Grant – Guidance Notes. Version 6 April 2014.

4.4.3 Waste disposal and pollution

Not applicable

4.4.4 Protection from unauthorised activities

Illegal access to the site from motor-bikes and vehicles has been a problem/threat to the nature conservation value of the woodland, and a nuisance to the local community, for several years. Regular meetings have been held with local representatives and a strategy to protect the site put in place. This includes preventing access to the woodland by installing vehicle barriers and obstacles, erecting signs aimed at dissuading trespass and repairing some footpaths with the aim of monitoring access and continuing local liaison.

4.4.5 Protection of other identified services and values

The site contains several important historical and archaeological features which will be protected during management operations. Buckenham's Well in Cpt 16 will be protected from damage and disturbance, as well as features in Cpts 4, 6, 7, 8, 9. Although most of these features are located within minimal or non-intervention management zones, local clearance of historical features will be carried out, in liaison with English Heritage. Care will need to be taken in Cpt 9 when re-instating coppice with standards management to protect the two barrows and associated banks.

4.5 Game management

A pheasant shoot has been taking place in Asham Wood for many years and it has been the continued use of the woodland for this purpose that has helped with the re-introduction of ride opening and coppicing management. There are several pheasant release pens located within the woodland and these will be left in place to minimise damage to woodland ground flora. The pond in Compartment 11 is also used for duck shooting, where food has been put down to attract the birds. These activities have a very low impact on the nature conservation significance of the site and has helped with the re-introduction of coppice management and prevention of illegal trespass.

4.6 Protecting and enhancing landscape, biodiversity and special features

4.6.1 Management of designated areas

140.6 ha of Asham Wood falls within the Mendip Woodlands Special Area of Conservation (SAC) and is a designated SSSI. The special features for which it is designated are the *Tilio-Acerion* Forests of slopes, screes and ravines; mixed woodland on base rich soils (See section 2 *Woodland Information*). Refer to Appendix 1 for SSSI/SAC maps and designation details.

The rationale behind the re-introduction of a coppice with standards management to this site is to maintain

and enhance its significant nature conservation interest, with minimal and non-intervention areas identified to protect the character of the woodland along its western boundary and to allow a development towards High Forest, to improve the structure and diversity of secondary woodland and to allow the specialist woodland flora and fauna associated with active coppice management to continue at a favourable conservation status in the long term.

4.6.2 Measures to enhance biodiversity and other special features [UKWAS 2.1.1/6.1.1]

Coppice with standards management

The high biodiversity area of Asham Wood, part of the Mendip Woodlands SAC, depends on woodland or woodland edge habitats on calcareous soils, with many of the species requiring appropriate woodland management to maintain favourable conservation status. This will be achieved by re-introduction of traditional coppice-with-standards management to blocks of woodland on a 10-25 year rotation. In addition, the retention of remaining areas as "wildwood" with minimal intervention management to create clearings and manage individual trees to maximise the diversity of the habitats and micro-habitats will allow species which are dependent on old-aged forest to thrive.

Ongoing management of stub pollards and ancient ash and small-leaved lime coppice stools will enable the veteran trees within the woodland to be maintained and protected. Special measures have been put in place to ensure the survival of veteran ash stools.

Ride management

Regular maintenance of some ride margins to create wide, sunny, sheltered, open grassland and scrub/woodland edge habitats, by thinning and scalloping will improve the biodiversity of these areas providing habitats for butterflies and invertebrates. Ride management will also create movement corridors for the more mobile species e.g. bats. Other rides and tracks will be left mainly overgrown for the more shade and damp-loving species.

Other important features and non-woodland habitats

Maintaining open areas of short, herb-rich grassland in the adjacent stripped and quarried areas of Compartment 24 may be significant in providing habitats for core reservoir populations of some of the more important plant and invertebrate species, most notably the butterflies. The value of these areas of herb-rich calcareous grassland is probably of equal nature conservation importance to that of the woodland because of the fragmented nature of unimproved grassland habitats in East Mendip and the rarity and diversity of the species which it contains. In addition, its importance also lies in its close association with the main woodland habitat itself.

Historical features

The network of historical features within Asham Wood will be protected in liaison with Somerset County Council's Historic Environment Service (HES). Existing features are being mapped and the HER updated. Further survey will be carried out once dense scrub has been removed during the felling operations, in order to establish their current status. Management guidance has been received from HES and is included in Appendix 3.

Deadwood habitats

Both standing and fallen dead wood habitats will be maintained throughout the woodland. Additional deadwood habitat will be created in minimal and non-intervention areas by allowing trees to lie where they fall and by either ring-barking selected trees or use of chemicals. The target for standing and fallen deadwood in roughly equal proportions, is up to a minimum of 20 cubic metres/ha or 5-10% of the average stand volume (WPG Operational Guidance for England, V3.1, 11.08.31).

Species Protection and Management

Section 2.2 *Woodland Resource Characteristics*, describes each management compartment and lists the presence of rare, threatened or important species within the compartments. Re-introduction of a coppice with standards management regime, riparian zone management, retention of minimal and non-intervention areas, will ensure that these species will be maintained at favourable conservation status in the long term. The programme of felling has been devised to avoid fragmentation of canopy links to protect habitat for dormice and bats. Widening of the rides to the north of Compartment 4 will be beneficial to bats as it lies adjacent to the stripped area in Compartment 24, which is an important foraging area for Greater Horseshoe Bats. Continued maintenance of wide rides connecting the bat roost in Compartment 27 to these areas and to woodland to the north (towards Mells) will also benefit Greater Horseshoe Bats. In a wider context, encouraging the creation and retention of permanent cattle grazed pasture on the land within Hanson's ownership surrounding Asham Wood will encourage bats to use the roost site, by increasing the available foraging area.

Special protection measures will be required to protect the greater horseshoe bat roost in the old conveyor tunnel by the fitting of a bat grille. This will be done in consultation with the Somerset Wildlife Trust and Natural England. The timescale for the fitting of the grille is likely to be late 2015.

Although there are no recent records for dormice in Asham, there is a good possibility that dormice may be present and that populations are small and scattered through pockets of suitable habitat over 400 acres of the site. If this is the case, then the task of confirming the presence of this European Protected Species may require several surveys, which are planned for the future.

4.6.3 Special measures for ancient semi-natural woodland (ASNW) and semi-natural woodland (SNW)

Approximately 50% of the wood should remain as non/minimal intervention to be allowed to develop to wildwood or high forest. This area will act as a reservoir for the sensitive species, many of which prefer shady conditions and which are more likely to be disturbed or damaged by management. This area should be maintained in one large, linked block at the margins of the wood which will also act as a buffer against outside influences. This marginal strip of minimal-intervention woodland should be not less than 50 metres in width.

All veteran and older standard trees should be retained and measures have been put in place to protect the

veteran ash coppice stools (section 4.1.1). The diversity of age-class structure should be maximised.

No more than one block of around 4-5 hectares (7.4 acres) should be managed in each of the two core woodland management areas in any one winter period.

4.6.4 Special measures for plantation on ancient woodland site (PAWS)

Not applicable.

4.6.5 Measures to mitigate impacts on landscape and neighbouring land [UKWAS 3.1.2]

As non or minimal intervention zones will be maintained along the western boundary, including the narrow neck of woodland between the northern and southern plateau areas, and the regenerating woodland in the previously stripped and quarry areas will be maintained in the east, the character of the woodland will not be affected in terms of impacts on the local landscape. Views from local villages and viewpoints will not change as a result of operations.

4.7 Management of social and cultural values

4.7.1 Archaeology and sites of cultural interest

General advice from English Heritage is to fell trees on historical features to prevent tree damage. Any felling programme in the vicinity of historical features will be discussed with English Heritage prior to operations taking place.

In view of the ongoing threat to the site from illegal motorbike and 4x4 vehicle use, particularly in the northern and western management compartments, keeping these features within a closed and wooded environment would help prevent damage from these sources. The situation will be monitored and fencing utilised if required.

4.7.2 Public access and impacts on local people

Authorised public access to the site is via the two public footpaths described in section 2.3. The footpaths have been severely damaged due to continued illegal access by motorbikes and 4x4 vehicles which is an ongoing threat to the site. A programme of footpath repairs commenced in 2014 and un-authorised access will be monitored prior to the next phase of repairs in c2015/16.

5 Consultation

Organisation/individual	Date received	Comment	Response/action
Aggregate Industries Simon Wiltshire Tel: 07802 258631 Email: simon.wiltshire@aggregate.com	10/10/2014	Otter and otter spraint recorded in Whatley Brook and in Torr Quarry in 2014. The section of wood within Torr ownership will remain as non-intervention woodland in any future site BAP as all on steep rocky slopes.	None required.
Richard Gossling Woodland Officer Forest Services Forestry Commission SW England Buller's Hill Kennford Exeter EX6 7XR Email: dick.gossling@forestry.gsi.gov.uk Mob: 07766 725 487 Home/Office: 01934 743293 Regional Office: 01392 834242	18/11/2014	Written comments received	Plan amended.
Natural England Bob Corns Tel: 03000 601 207 Email: bob.corns@naturalengland.org	11/11/2014	Written comments received.	Plan amended.
Somerset Wildlife Trust Eleanor Higginson Landscape Ecologist Callow Rock Office Shipham Gorge Cheddar Somerset BS27 3DQ Email: eleanor.higginson@somersetwildlife.org	07/11/2014	Written comments received.	Plan amended.
Jan Grove	9/10/2014; 12/11/2014 & Site visit on	Written comments received.	SCC Historic Environment Record updated. Written comments & specific management information

Countryside Archaeologist Historic Environment Service Somerset County Council Somerset Heritage Centre Brunel Way Taunton TA2 6SF Tel: 01823 347436 Email: JCGrove@somerset.gov.uk	13/11/2014, with further written comments received on 18/11/2014		incorporated in revised plan.
Mike Wilkins, Game Keeper Oaklands Radstock BANES BA3 5EH Tel: 01761 232575 Mob: 0770 421 2280	27/10/2014	Informal consultation and discussion.	Once plan finalised, meet with Mike Wilkins to assess the requirement for extra man-power resources.

6 Monitoring plan summary

Objective number, issue or UKWAS Requirement	Indicator	Method of assessment	Monitoring period	Responsibility	How will information be used
Re-establish coppice with standards management	4-5 hectares brought into management per year	Visual inspection/Fixed point photography	Annually over period of the plan	Hanson Landscape Architect Alex Pick	Coppice management programme adjusted accordingly
Maintain and extend woodland rides	Approximately 100m/annum brought into management	Visual inspection	Annually over period of the plan	Hanson Landscape Architect Alex Pick	Ride management programme adjusted accordingly
Introduce riparian zone management	0.2ha of clearing created in years 1,2 & 6	Visual inspection/Fixed point photography	Annually from years 1-10.	Hanson Landscape Architect Alex Pick	Riparian zone management programme adjusted accordingly
Improve age class & diversity of minimal intervention areas	Thinning to waste of selected areas according to timescale of management plan	Visual inspection	Periodically over the life of the plan	Hanson Landscape Architect Alex Pick	Thinning operations carried out as required
Achieve High Forest Management with minimal intervention where required	5-6 gaps of 20m diameter per Cpt, either by natural events or management intervention	Visual inspection	Every five years	Hanson Landscape architect Alex Pick	Remedial action will be taken if target not achieved within five years
Bring areas of remnant and secondary woodland, outside the	Thin to waste according to timetable of	Visual inspection	Every five years	Hanson Landscape Architect Alex Pick	Remedial action to be taken if target not achieved within five

SAC area, into favourable management	management plan				years
Review of survey rare, protected and notable species	Update surveys of bats, dormice, butterflies and vegetation	Brief Survey Reports	Two every five years	Hanson Landscape architect Alex Pick/Third parties/voluntary groups	Feedback information into work programmes
Aim to eradicate illegal vehicular use of site	Liaison with local community and police engagement	Visual Inspection	Six monthly	Hanson Landscape Architect	Remedial measures will be introduced as required and where appropriate
Watching brief on threat from *Chalara fraxinea*	Presence/Absence of ash-die back disease	Visual inspection/Photographic evidence	Annually	Hanson Landscape Architect	Remedial action will be taken if threat materialises.

7 Work programmes

7.1 Outline long-term work programme (2019 - 2033)

(Use this table to outline medium to long term areas of work)

Cpt. Ref or Name	Activity	Year *(tick)*	
		6-10	11-20+
Cpt 1 (west) & riparian zone	Coppice with standards in riparian zone (Year 6) and thinning in rest of coupe, singling some of the larger oak/ash standards	√	√
Cpt 2 (exc. Riparian zone)	Coppice with standards		√
Cpt 3	Coppice with standards in two coupes (north in year 6 & south in year 23	√	√
Cpt 4	Coppice with standards		√
Cpt 5	Coppice with standards in two coupes (west in year 15 & east in year 16)		√
Cpt 6	Coppice with standards in two coupes (west in year 6 & east in year 12)	√	√
Cpt 7	Coppice with standards		√
Cpt 8	Coppice with standards in two coupes (middle block in year 8 & north & south blocks in year 18)	√	√
Cpt 9	Coppice with standards in two coupes (south in year 13 & north in year 14		√
Cpt 10	Coppice with standards (west to east)		√
Cpt 11	Thinning to south/south-east of pond (year 11) & coppice with standards (year 24)		√
Cpt 13	Coppice with standards in two coupes (south in year 9 & north in year 10)	√	
Cpt 25	Thin to waste		√
Cpt 26	Thin to waste		√
Cpt 27	Thin to waste		√
Cpt 28	Thin to waste		√

7.2

Short-term work programme (2014- 2018)

7.3 Use this table to collect basic inventory data for the woodland areas you propose to work during the next 5 years)

Cpt. Ref / Name	Area (ha)	Main Species	P. Year	Yield Class	Activity	Year				
						1	2	3	4	5
Cpt 1 (east)	3.75[6]	NBL[7]	Pre 1600	4[8] (562.5 cu m)	Thinning & singling of larger oak/ash coppice re-growth			√		
Cpt 2	1.0	NBL	Pre 1600	4 (150 cu m)	Riparian zone management of coppice with standards		√			
Cpt 12	1.25	NBL	Pre 1600	4 (187.5 cu m)	Coppice with standards (retaining 50m minimal intervention zone along western margin)					√
Cpt 14	2.0	NBL	Pre 1600	4 (300 cu m)	Coppice with standards (retaining 20-50m wide minimal intervention zone along western margin)		√			
Cpt 15	1.8	NBL	Pre 1600	4 (270 cu m)	Coppice with standards in a small coupe, retaining western & southern narrow woodland margins as minimal intervention woodland zone				√	
Cpt 16	2.25	NBL	Pre 1600	4	Coppice with standards in riparian zone and thinning in rest of compartment, while retaining approx 0.5ha of minimal intervention woodland in western & north-eastern block.	√				
Ride Management	5.5	NBL	Pre 1600	4 (825 cu m)	Ride widening, and scalloping to create 50m wide zone of woodland edge, mixed scrub and grass vegetation.	√	√	√	√	√

[6] Hectarage figures in this table refer to area of the compartment which will be brought into management in any given year.

[7] NBL = Native mixed broadleaves, predominantly ash but with some oak, field maple and hazel.

[8] Yield class for this type of woodland is 150 cubic metres per hectare

8 Costing Operations

All the coupe coppicing is self-funding due to a firewood contractor carrying out the works. Fencing is erected by the firewood contractor and fence is re-used, therefore the expected costs are c£500/yr for materials only.

Thinning to waste operations: expected costs are £500/ha.

Funding for these proposals will be from Hanson UK's quarry restoration budget which is money accrued from stone sales and covers the requirements of restoration, land management, including biodiversity enhancements. The costs of erecting the bat grille over the entrance to the roost site are likely to be in the region of £3,000.00.

Additional funding may be sought from future woodland grant schemes.

The costs of monitoring will be met primarily through the use of volunteers, special interest groups and university links, with any additional costs for the use of specialist consultants, met by Hanson UK.

9 Maps

Map no./Title	Description
Map 1	Location Plan (Drawing No. A85m/17; Jan 2014)
Map 2	Landscape Context (Drawing No. A85m/18; Jan 2014)
Map 3	Historic Felling (Drawing No. A85m/19; Jan 2014)
Map 4	Ecological and Historical Features (Drawing No. A85m/20; Jan 2014)
Map 5	Proposed felling Programme (Drawing No. A85m/21; Feb 2014)

10Thinning, felling and restocking proposals

10.1 Table A

Applicants seeking funding through a woodfuel initiative for harvesting machinery or wood fuel boilers, or wishing to apply for **EWGS Woodfuel WIG** must provide basic inventory data (WPG template 7.2) and estimate the total volume that is to be thinned and felled during the period of this plan, **by completing Table A**.

Not Applicable

(Using inventory data from table 7.2, complete a timber volume estimate)

Cpt(s) (from table 7.2)	Main Species (BL/Con)	Total work Area (ha)	Estimated volume to be harvested during work periods (m3)		
			Yr 1 - 5	Yr 6 - 10	Yr 11 - 20
Example 1a, 2, 3	*Con*	*7.2*	*300*	-	-

10.2 Table B

This section must be fully completed by the applicant if they wish to gain felling licence approval from the Forestry Commission. The work detailed below must match the proposals set out in the plan. For details on how to complete this table, please refer to **EWGS4 – Woodland Regeneration** for guidance and Tree Felling guidance.

4. Cpt. / Sub Cpt.	5. Area (ha)	6. % area to be worked	7. Type of felling	8. % of felled area comprising:		9. Felling licence type	10. Change in woodland type		11. Preferred claim year	13. Restock mixture		14. % Estab. by natural regen	Standard proposals	12. Notes / Details
				BL	CON		*From*	*To*		Species	%			
1	7.50	80%	FC	Ash 50%; Oak 20%; Hazel 20%; 10% MB [9]		C	ASNW - Nat	Nat	14/15	N/A		100%		Coppice all species retaining all mature oak standards and maiden ash poles.
2	4.75	100%	FC	Ash 50%; Oak 20%; Hazel 20%; 10% MB (inc. alder)		C	ASNW - Nat	Nat	14/15	N/A		100%		Coppice all species retaining all mature oak standards and maiden ash poles.
3	4.25	90%	FC	Ash 50%; Oak 20%; Hazel 20%; 10% MB		C	ASNW - Nat	Nat	14/15	N/A		100%		Coppice all species retaining all mature oak standards and maiden ash poles.
4	2.25	100%	FC	Ash 50%; Oak 20%; Hazel		C	ASNW - Nat	Nat	14/15	N/A		100%		Coppice all species retaining all mature oak standards and

[9] Mixed Broad-leaves (MB) comprise an estimated 10% of each coppice coupe. Species include sycamore, field maple, small-leaved lime, wych elm, yew, privet, dogwood, elder, spindle, guelder rose, wayfaring-tree, hawthorn, birch, holly, blackthorn, crab-apple and rowan.

				20%; 10% MB										maiden ash poles.
5	4.25	100%	FC	Ash 50%; Oak 20%; Hazel 20%; 10% MB		C	ASNW - Nat	Nat	14/15	N/A		100%		Coppice all species retaining all mature oak standards and maiden ash poles.
6	6.00	100%	FC	Ash 50%; Oak 20%; Hazel 20%; 10% MB		C	ASNW - Nat	Nat	14/15	N/A		100%		Coppice all species retaining all mature oak standards and maiden ash poles.
7	4.25	75%	FC	Ash 50%; Oak 20%; Hazel 20%; 10% MB		C	ASNW - Nat	Nat	14/15	N/A		100%		Coppice all species retaining all mature oak standards and maiden ash poles.
8	3.75	100%	FC	Ash 50%; Oak 20%; Hazel 20%; 10% MB		C	ASNW - Nat	Nat	14/15	N/A		100%		Coppice all species retaining all mature oak standards and maiden ash poles.
9	3.75	100%	FC	Ash 50%; Oak 20%; Hazel 20%; 10% MB		C	ASNW - Nat	Nat	14/15	N/A		100%		Coppice all species retaining all mature oak standards and maiden ash poles.
10	4.75	100%	FC	Ash 50%; Oak 20%; Hazel 20%; 10% MB		C	ASNW - Nat	Nat	14/15	N/A		100%		Coppice all species retaining all mature oak standards and maiden ash poles.
11	2.75	100%	FC	Ash 50%; Oak 20%; Hazel 20%; 10% MB (inc. sallow &		C	ASNW - Nat	Nat	14/15	N/A		100%		Coppice all species retaining all mature oak standards and maiden ash poles.

				silver birch)										
12	2.50	50%	FC	Ash 50%; Oak 20%; Hazel 20%; 10% MB		C	ASNW - Nat	Nat	14/15	N/A		100%		Coppice all species retaining all mature oak standards and maiden ash poles.
13	6.50	80%	FC	Ash 50%; Oak 20%; Hazel 20%; 10% MB		C	ASNW - Nat	Nat	14/15	N/A		100%		Coppice all species retaining all mature oak standards and maiden ash poles.
14	2.75	70%	FC	Ash 50%; Oak 20%; Hazel 20%; 10% MB		C	ASNW - Nat	Nat	14/15	N/A		100%		Coppice all species retaining all mature oak standards and maiden ash poles.
15	13.25	≤10%	FC	Ash 50%; Oak 20%; Hazel 20%; 10% MB		C	ASNW - Nat	Nat	14/15	N/A		100%		Coppice all species retaining all mature oak standards and maiden ash poles.
16	2.75	70%	FC	Ash 50%; Oak 20%; Hazel 20%; 10% MB		C	ASNW - Nat	Nat	14/15	N/A		100%		Coppice all species retaining all mature oak standards and maiden ash poles.
17	4.50	≤10%	T	Ash 20%; Sycamore 20%; Beech 20%; MB 20%		C	ASNW - Nat	Nat	14/15	N/A		100%		Thinning to reduce sycamore numbers and open up canopy adjacent to footpaths.
18	1.75	≤10%	T	Ash 50%; Oak 20%; Hazel 20%; 10%		C	ASNW - Nat	Nat	14/15	N/A		100%		Thinning to open up footpaths & increase light levels

				MB										
19	3.75	≤0-10%	T	Ash 50%; Oak 20%; Hazel 20%; 10% MB		C	ASNW - Nat	Nat	14/15	N/A		100%		Singling of coppice stems to favour long-lived upright wind-firm stems
20	1.00	≤0-10%	T	Ash 50%; Oak 20%; Hazel 20%; 10% MB		C	ASNW - Nat	Nat	14/15	N/A		100%		Singling of coppice stems to favour long-lived upright wind-firm stems
21	7.50	≤0-10%	T	Ash 50%; Oak 20%; Hazel 20%; 5% MB (inc. alder)	Yew (veteran) 5%	C	ASNW - Nat	Nat	14/15	N/A		100%		Singling of coppice stems to favour long-lived upright wind-firm stems
22	10.00	≤0-10%	T	Ash 50%; Oak 20%; Hazel 20%; 10% MB		C	ASNW - Nat	Nat	14/15	N/A		100%		Singling of coppice stems to favour long-lived upright wind-firm stems
23	12.00	≤0-10%	T	Ash 50%; Oak 20%; Hazel 20%; 5% MB	Yew 5%	C	ASNW - Nat	Nat	14/15	N/A		100%		Singling of coppice stems to favour long-lived upright wind-firm stems
24	9.00	≤0-10%	T	Birch 70%; Willow 30%;		C	ASNW - Nat	Nat	14/15	N/A		100%		Thinning of birch regeneration to favour long-lived native ash/oak regeneration
25	7.00	≤0-10%	T	Birch 70%; MB 30%		C	ASNW - Nat	Nat	14/15	N/A		100%		Thinning of birch regeneration to favour long-lived native ash/oak regeneration
26	14.05	≤0-10%	T	Ash 70%; MB 30%		C	ASNW - Nat	Nat	14/15	N/A		100%		Singling of coppice stems to favour long-lived upright wind-firm stems

27	20.75	≤0-10%	T	Ash 30%; Birch 40% MB 30%		C	ASNW - Nat	Nat	14/15	N/A		100%		Thinning to improve woodland structure and age-class diversity
28	5.00	≤0-10%	T	Ash 50%; Oak 20%; Hazel 20%; 10% MB		C	ASNW - Nat	Nat	14/15	N/A		100%		Singling of coppice stems to favour long-lived upright wind-firm stems

Z:\ACAD\WESSEX\ASHAMWD\A85m13 (EWGS 1).dwg

17 4.50
16 2.75
1 7.50
18 1.75
19 3.75
2 4.75
15 13.25
10 4.75
7 4.25
8 3.75
21 7.50
3 4.25
25 7.00
20 1.00
26 14.05
6 6.00
9 3.75
4 2.25
5 4.25
11 2.75
24 12.00
27 20.75
22 10.00
28 5.00
12 2.50
13 6.50
14 2.75
23 12.00

Asham Wood
Asham Quarry
Westdown Quarry
HYDE PARK CORNER
FOX BANK
CRUSHER
Stripped Area
Boddenham's Coppice
Shearmoor Wood
Permanent sample plot
WS

Hanson
HEIDELBERGCEMENT Group

Site: Asham Wood

Title: English Woodland Grant Scheme EWGS 1

Scale	Date	Drawing No.
1:5,000	Jul '12	A85m/13
Drawn by JWB	Checked by ALP	

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Hanson
HEIDELBERGCEMENT Group

Site: Asham Wood

Title: Map 1
Location Plan

Scale	Date	Drawing No.
N.T.S	Jan '14	A85m/17
Drawn by JWB	Checked by ALP	

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KEY

Site boundary

Hanson HEIDELBERGCEMENT Group

Site: Asham Wood

Title: Map 2 Landscape Context

Scale	N.T.S	Date	Jan '14	Drawing No.
Drawn by	JWB	Checked by	ALP	A85m/18

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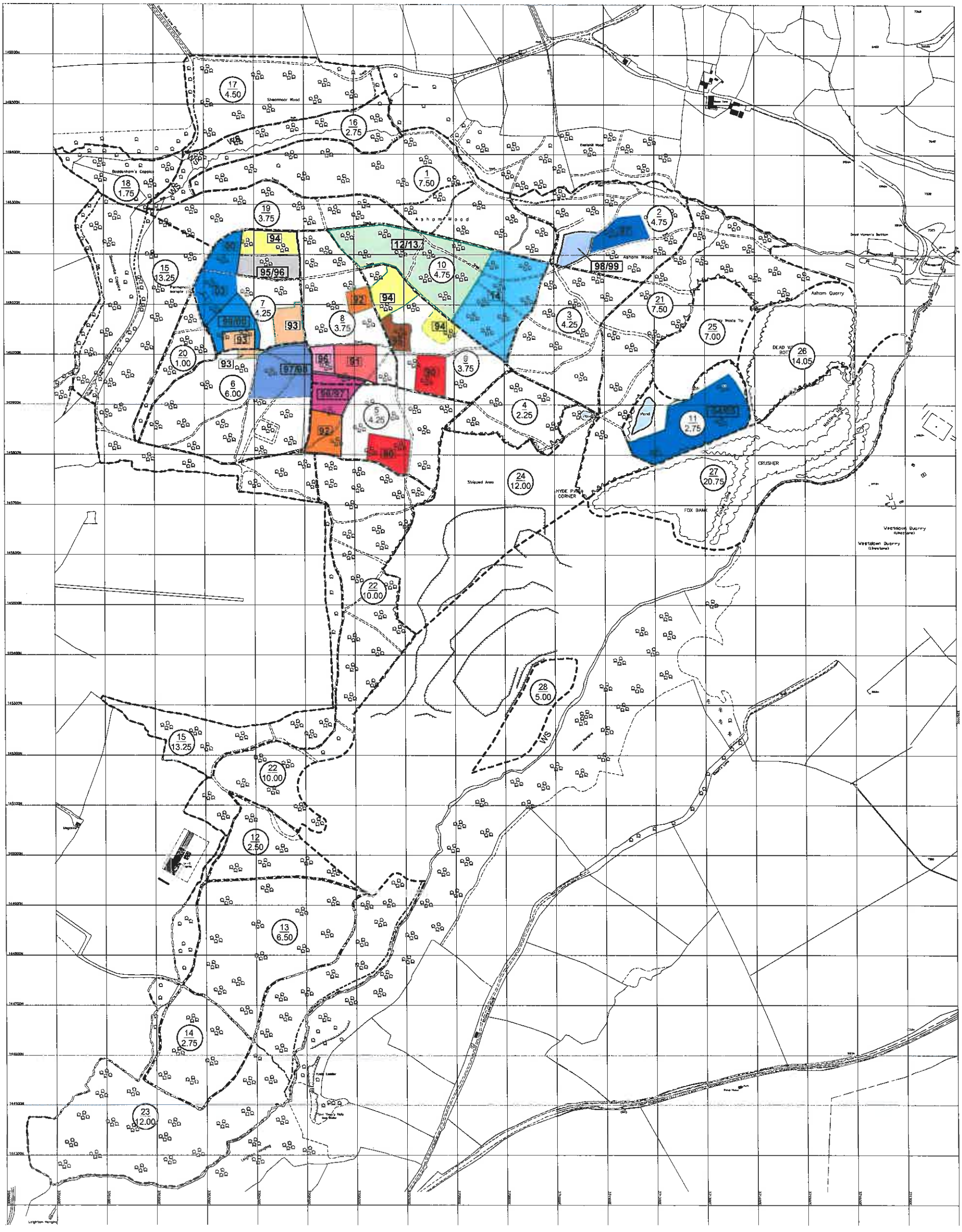

KEY

- Felled in 1990
- Felled in 1991
- Felled in 1992
- Felled in 1993
- Felled in 1994
- Felled in 1995
- Felled in 1995/96
- Felled in 1996
- Felled in 1996/97
- Felled in 1997
- Felled in 1997/98
- Felled in 1998/99
- Felled in 1999/00
- Felled in 2000
- Felled in 2004/05
- Felled in 2012/13
- Felled in 2014

Hanson HEIDELBERGCEMENT Group

Site: Asham Wood

Title: Map 3 Historic Felling

Scale	1:7,500 @ A3	Date	Sep '14	Drawing No.
Drawn by	JWB	Checked by	ALP	A85m/19

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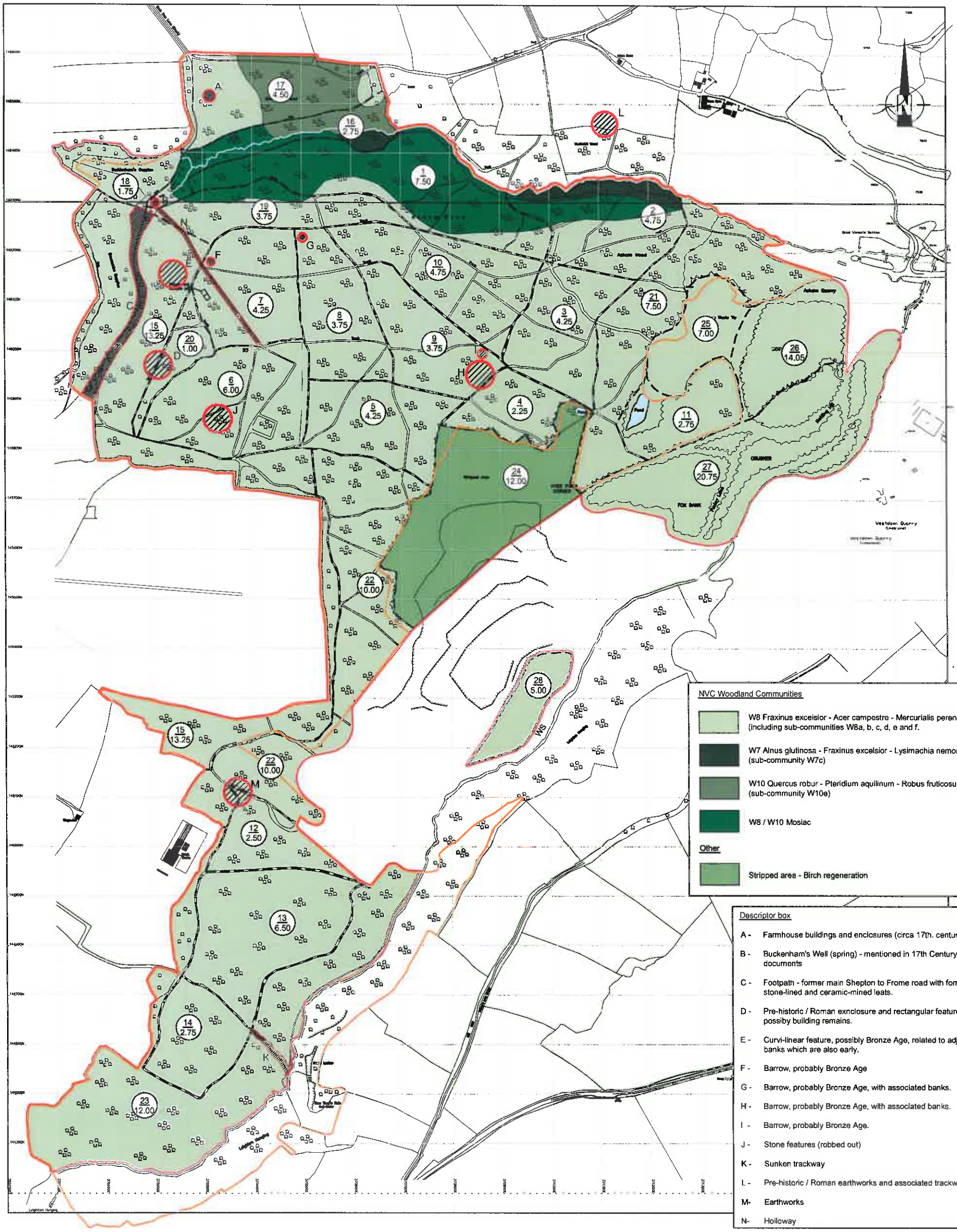

NVC Woodland Communities

- W8 Fraxinus excelsior - Acer campestre - Mercurialis perennis (including sub-communities W8a, b, c, d, e and f.
- W7 Alnus glutinosa - Fraxinus excelsior - Lysimachia nemorum (sub-community W7c)
- W10 Quercus robur - Pteridium aquilinum - Robus fruticosus (sub-community W10e)
- W8 / W10 Mosiac

Other

- Stripped area - Birch regeneration

Descriptor box

- A - Farmhouse buildings and enclosures (circa 17th. century)
- B - Buckenham's Well (spring) - mentioned in 17th Century documents
- C - Footpath - former main Shepton to Frome road with former stone-lined and ceramic-mined leats.
- D - Pre-historic / Roman exnclosure and rectangular features, possiby building remains.
- E - Curvi-linear feature, possibly Bronze Age, related to adjacent banks which are also early.
- F - Barrow, probably Bronze Age
- G - Barrow, probably Bronze Age, with associated banks.
- H - Barrow, probably Bronze Age, with associated banks.
- I - Barrow, probably Bronze Age.
- J - Stone features (robbed out)
- K - Sunken trackway
- L - Pre-historic / Roman earthworks and associated trackway
- M - Earthworks
- N - Holloway

KEY

- SSSI boundary
- EWGS application
- Stream
- Pond
- Historic feature

Hanson HEIDELBERGCEMENT Group

Site: Asham Wood

Title: Map 4 Ecological and Historical Features

Scale	1:7,500 @ A3	Date		Drawing No.	A85m/20
Drawn by	JWB	Checked by	ALP		

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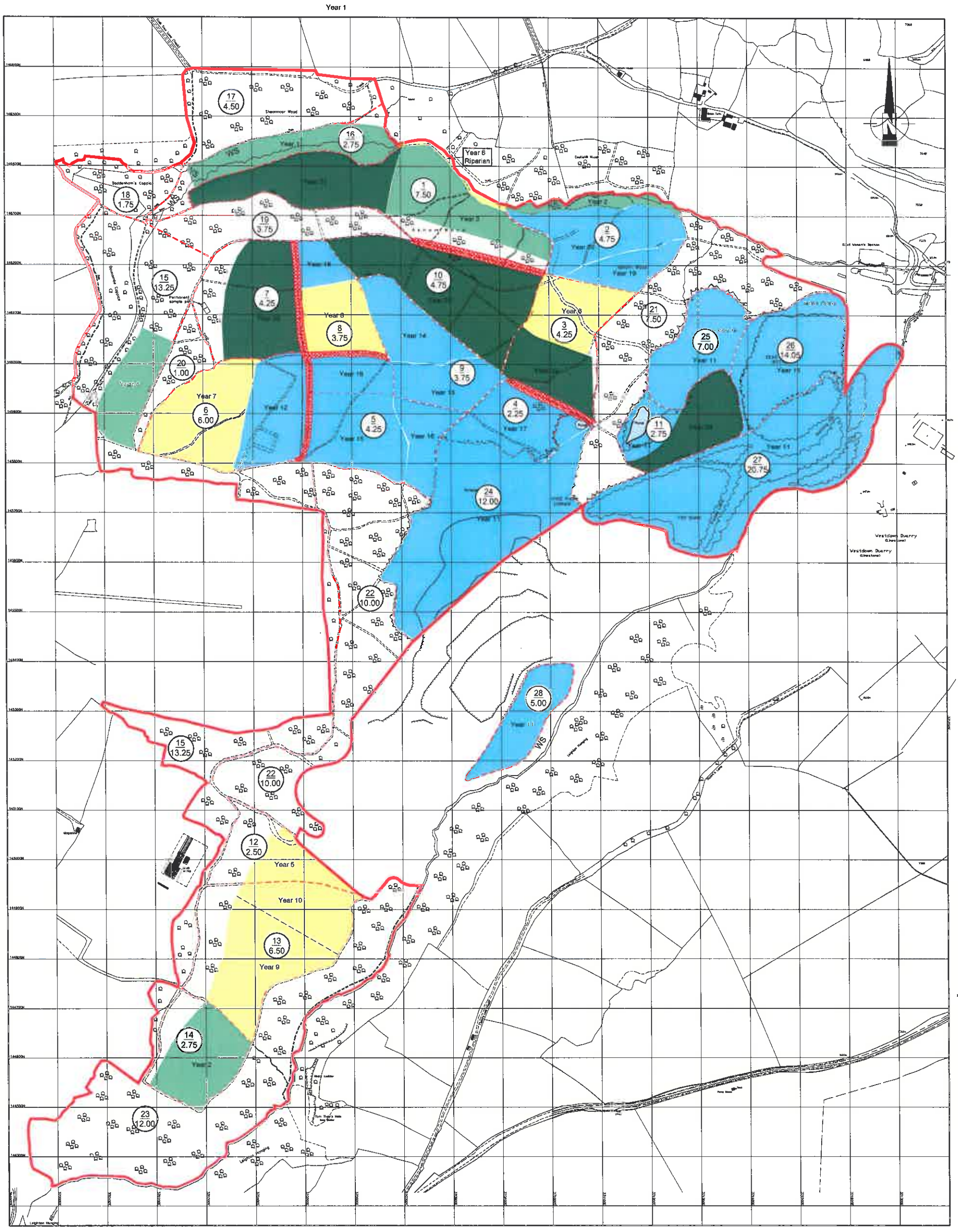


KEY

- Short term 1 - 5 years
- Medium term 6 - 10 years
- Long term 11 - 20 years
- Very long term 21+ years
- Ride widening and scalloping
- Minimal intervention zones
- Woodland management planning boundary
- Compartment numbers (15 / 13.25)
- Compartment boundary

Hanson HEIDELBERGCEMENT Group

Site: Asham Wood

Title: Map 5 Felling Programme

Scale	1:7,500 @ A3	Date	Sep '14	Drawing No.
Drawn by	JWB	Checked by	ALP	A85m/21

Appendix 1

COUNTY: SOMERSET SITE NAME: ASHAM WOOD

DISTRICT: MENDIP

Status: Site of Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act 1981 (as amended)

Local Planning Authority: Mendip District Council, Somerset County Council

National Grid Reference: ST 705460 Area: 140.6 (ha) 347.5 (ac)

Ordnance Survey Sheet 1:50,000: 183 1:10,000: ST 74 NW, SW, ST 64 NE, SE

Date Notified (Under 1949 Act): 1963 Date of Last Revision: 1972

Date Notified (Under 1981 Act): 1984 Date of Last Revision: –

Other Information:
Site area reduced since last Revision. Nature Conservation Review Grade I Site. Part leased and managed by the Somerset Trust for Nature Conservation.

Description:
Asham Wood is the largest and most diverse of the ancient semi-natural woods in the Mendips. Despite recent partial destruction due to quarrying it remains one of the most important.

The wood occupies 2 deep valleys and the intervening plateau. Most of the underlying rocks are calcareous Carboniferous Limestones and Shales, but Devonian Portishead Beds outcrop along the northern valley. The soils are neutral to strongly alkaline over the limestone, but mildly acid over the Devonian beds. Unlike other Mendip ancient woods the soils include a full range from excessively drained skeletal soils on the limestone outcrops to permanently wet conditions along the streamside. Mostly, however, the soils are freely-drained clay loams with a degree of flushing along the lower slopes of the valleys.

Several woodland types occur within the wood. On the heavy acid soils of the northern valley slopes one finds acid Pedunculate Oak-Hazel-Ash woodland. Along the valley bottom the Alder *Alnus glutinosa* is mostly on neutral-alkaline mineral soils, but in parts of the southern valley Alderwood was more extensive and wet, and is classified as base-rich springline Alderwood. On the limestone plateau and slopes the woodland is a mixture of dry Ash-Maple woodland and Maple-Ash-Lime woodland. The latter being more abundant south of Tunscombe Bottom. Both these types are particularly characteristic of Mendip woodlands and indeed are better developed here than elsewhere in Britain. Finally, on the steep slopes of Tunscombe Bottom and Leighton Hanging Wych Elm *Ulmus glabra* is present and generates a further type, calcareous Ash-Wych Elm woodland. This is found both on the flushed lower slopes and on rock outcrops, where Yew *Taxus baccata* is abundant. This range of woodland types is greater than in other Mendip ancient woods, and it includes the 2 types of nationally limited distribution which are especially characteristic of this area. All these woodland types have long been treated as coppice-with-standards, a system which seems to have finally died out here as late as 1950. The principal feature of interest is the abundance of stub and small pollards of Pedunculate Oak *Quercus robur*, Ash *Fraxinus excelsior*, Field Maple *Acer campetre* and Small-leaved Lime *Tilia codata*. Indeed, Pedunculate Oak in particular is a complete mixture of all treatment forms: standards of maiden origin, pollards, stubs and low-cut coppice. A similar structure can be seen in other Mendip Ash-Lime woods, but not as well developed as at Asham. Within the coppice system shrubs survived as opportunists in clearings and many are now widespread, notably: Guelder Rose *Viburnum opulus*,

Wayfaring Tree *V. lantana*, Dogwood *Cornus sanguinea* and Spindle *Euonymus europaeus*. Holly *Ilex aquifolium*, Hawthorn *Crataegus monogyna*, Crab Apple *Malus sylvestris* and Blackthorn *Prunus spinosa* are less common. Rowan *Sorbus aucuparia* is restricted to areas with more acid soils.

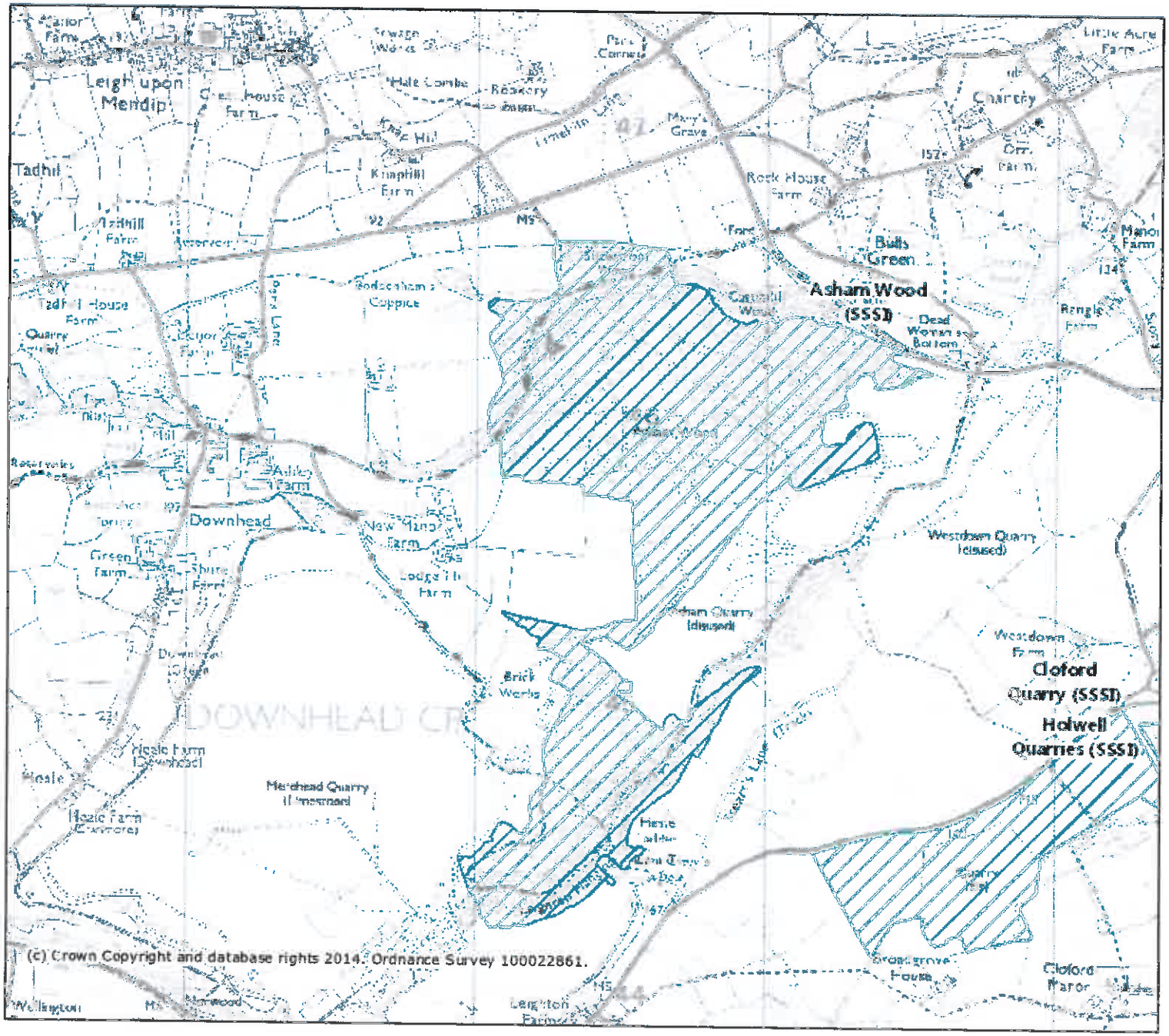
The principal species of the ground vegetation vary with soil type and drainage, but they include Dog's mercury *Mercurialis perennis*, Wood Anemone *Anemone nemorosa* and Ivy *Hedera helix* on the alkaline soils, Ramsons *Allium ursinum* on the flushed alkaline slopes, Creeping Soft-grass *Holcus mollis* on the acid soils of the northern valley and Meadowsweet *Filipendula ulmaria* along the wet valley sides. Species normally restricted to ancient woodlands include Herb Paris *Paris quadrifolia*, Solomon's Seal *Polygonatum multiflorum*, Lily of the Valley *Convallaria majalis*, Toothwort *Lathraea squamaria*, Yellow Archangel *Lamiastrim galeobdolon* and Wood Melick *Melica uniflora.* The nationally rare Narrow-leaved Bittercress *Cardamine impatiens* is of special interest while other species of note include Columbine *Aquilegia vulgaris*, Adder's tongue *Ophioglossom vulgatum*, Wild Daffodil *Narcissus pseudonarcissus*, Small Teasel *Dipsacus pilosus*, Common Spotted Orchid *Dactylorhiza fuchsii*, Broad-leaved Helleborine *Epipactis helleborine*, Early-purple Orchid *Orchis mascula*, Water Avens *Geum rivale* and Hybrid Avens *Geum x intermedium*. The widespread occurrence of Meadow Saffron *Colchicum autamnale* in woodland is also unusual.

The generally sheltered and humid conditions provide an ideal environment for a wide range of lower plants. 114 species of Moss, 21 species of Liverwort, and 122 species of Fungi have been recorded.

Resident breeding butterflies include the local Grizzled Skipper *Pyrgus malvae*, Silver-washed Fritillary *Argynnis paphia* and Purple Hairstreak *Thecla quercus*. The site supports 41 species of Mollusca. Of particular interest are the nationally rare snails *Ena montana* and *Acicula fusca.*

Buzzard *Buteo buteo*, Sparrowhawk *Accipiter nisus*, Garden Warbler *Sylvia borin*, Spotted Flycatcher *Muscicapa striata* and Great Spotted Woodpecker *Dendrocopos major* have bred in the woodland in recent years.

Asham Wood (SSSI)



Legend

Sites of Special Scientific Interest (England)

Projection = OSGB36
xmin = 367000
ymin = 143300
xmax = 373700
ymax = 148000
Map produced by MAGIC on 17 December, 2014.

NATURA 2000

STANDARD DATA FORM

FOR SPECIAL PROTECTION AREAS (SPA)
FOR SITES ELIGIBLE FOR IDENTIFICATION AS SITES OF COMMUNITY IMPORTANCE (SCI)
AND
FOR SPECIAL AREAS OF CONSERVATION (SAC)

1. Site identification:

1.1 Type B

1.2 Site code UK0030048

1.3 Compilation date 199803

1.4 Update 200407

1.5 Relationship with other Natura 2000 sites

1.6 Respondent(s) International Designations, JNCC, Peterborough

1.7 Site name **Mendip Woodlands**

1.8 Site indication and designation classification dates

date site proposed as eligible as SCI	199803
date confirmed as SCI	200412
date site classified as SPA	
date site designated as SAC	200504

2. Site location:

2.1 Site centre location

longitude	**latitude**
02 25 18 W	51 12 25 N

2.2 Site area (ha) 253.92

2.3 Site length (km)

2.5 Administrative region

NUTS code	Region name	% cover
UK632	Somerset	100.00%

2.6 Biogeographic region

Alpine	Atlantic	Boreal	Continental	Macaronesia	Mediterranean
	X				

3. Ecological information:

3.1 Annex I habitats

Habitat types present on the site and the site assessment for them:

Annex I habitat	% cover	Representativity	Relative surface	Conservation status	Global assessment
Semi-natural dry grasslands and scrubland facies: on calcareous substrates (*Festuco-Brometalia*)	1.6	D			

Tilio-Acerion forests of slopes, screes and ravines	33.01	A	C	A	A
Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*)	0.4	D			

3.2 Annex II species

	Population				Site assessment			
	Resident	Migratory						
Species name		Breed	Winter	Stage	Population	Conservation	Isolation	Global
Rhinolophus hipposideros	6-10	-	-	-	D			
Rhinolophus ferrumequinum	1-5	-	-	-	D			

4. Site description

4.1 General site character

Habitat classes	% cover
Marine areas. Sea inlets	
Tidal rivers. Estuaries. Mud flats. Sand flats. Lagoons (including saltwork basins)	
Salt marshes. Salt pastures. Salt steppes	
Coastal sand dunes. Sand beaches. Machair	
Shingle. Sea cliffs. Islets	
Inland water bodies (standing water, running water)	
Bogs. Marshes. Water fringed vegetation. Fens	
Heath. Scrub. Maquis and garrigue. Phygrana	
Dry grassland. Steppes	1.5
Humid grassland. Mesophile grassland	
Alpine and sub-alpine grassland	
Improved grassland	
Other arable land	
Broad-leaved deciduous woodland	98.5
Coniferous woodland	
Evergreen woodland	
Mixed woodland	
Non-forest areas cultivated with woody plants (including orchards, groves, vineyards, dehesas)	
Inland rocks. Screes. Sands. Permanent snow and ice	
Other land (including towns, villages, roads, waste places, mines, industrial sites)	
Total habitat cover	**100%**

4.1 Other site characteristics

Soil & geology:

Basic, Limestone, Nutrient-poor, Sedimentary

Geomorphology & landscape:

Caves, Escarpment, Hilly, Lowland

4.2 Quality and importance

Tilio-Acerion forests of slopes, screes and ravines

- for which this is considered to be one of the best areas in the United Kingdom.

4.3 Vulnerability

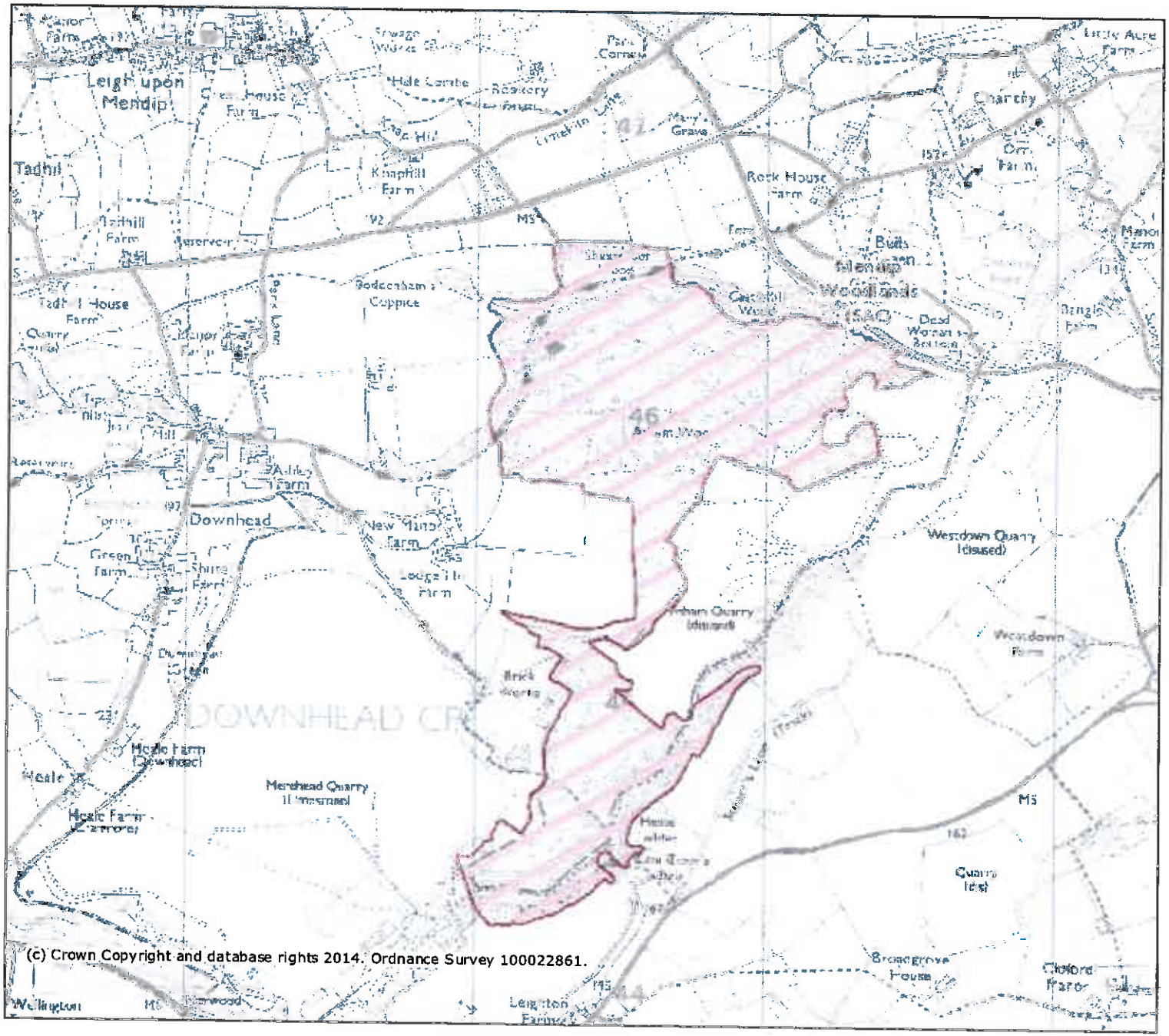
Two parts of the SAC, Ebbor Gorge and Rodney Stoke, are National Nature Reserves, with the exception of a small area at Rodney Stoke. These are not currently under any threat. Cheddar Wood is a Somerset Wildlife Trust nature reserve but is owned by the quarrying company, Associated Aggregates. The woodland is currently protected by local planning policies as a notified SSSI. No threat from quarrying is at present anticipated. The Asham Wood extension has been badly affected by quarrying in the past with up to 20% lost. This has now ceased and no major threats are apparent.

5. Site protection status and relation with CORINE biotopes:

5.1 Designation types at national and regional level

Code	% cover
UK01 (NNR)	25.7
UK04 (SSSI/ASSI)	100.0

Mendip Woodlands SAC



Legend

- Special Areas of Conservation (England)

Projection = OSGB36
xmin = 367000
ymin = 143300
xmax = 373700
ymax = 148000
Map produced by MAGIC on 17 December, 2014.

Appendix 2

Appendix 2

Asham Wood Management Plan Species List

Trees

Higher Plants

Grasses, Sedges and Rushes

Bryophytes (notable species only)

Fungi (notable species only)

Mammals

Reptiles

Birds

Butterflies

Other Invertebrates (notable species only)

Asham Wood – Management Plan – Species Lists

FLORA

TREES

ACER CAMPERSTRE	FIELD MAPLE
ACER PSUEDOPLATANUS	SYCAMORE
ALNUS GLUTINOSA	ALDER
ALNUS INCANA	GREY ALDER
BETULA PENEULA	SILVER BIRCH
BETULA PUBESCENS	BROWN (DOWNY) BIRCH
CASTANEA SATIVA	SWEET CHESTNUT
CORNUS SANGUINEA	COMMON DOGWOOD
CORYLUS AVELLANA	HAZEL
CRATAEGUS MONOGYNA	HAWTHORN
EUONYMUS EUROPAEUS	SPINDLE
FAGUS VATICA	BEECH
FRANGULA ALNUS	ALDER BLACKTHORNE
FRAXINUS EXCELSIOR	ASH
ILEX AUIIFOLIUM	HOLLY
LARIX SP.	LARCH
LIGUSTRUM VULGARE	PRIVET
MALUS SYLVESTRIS	CRAB APPLE
PICEA ABIES	NORWAY SPRUCE
PINUS SYLVESTRIS	SCOTS PINE
POPULUS NIGRA VAR. ITALICA	LOMBARDY POPLAR
POPULUS TREMULA	ASPEN (1999)
PRUNUS AVIUM	WILD CHERRY
PRUNUS SPINOSA	BLACKTHORN
QUERCUS PETRAEA	SESSILE OAK
QUERCUS ROBUR	PENEUNCULATE OAK
RHAMNUS CATHARTICUS	BUCKTHORN
SALIX CAPREA	GOAT WILLOW (GREAT SWALLOW)
SALIX CINEREA	GREY WILLOW
SAMBUCUS NIGRA	ELDER
SORBUS ARIA	WHITEBEAM
SORBUS AUCUPARIA	ROWAN
SORBUS TORMINALIS	WILD TREE SERVICE (1999)
TAXUS BACCATA	YEW
TILIA CORDATA	SMALL LEAVED LIME (1999)
ULMUS GLABRA	WYCH ELM
ULMUS PROCERA	ENGLISH ELM
VIBURNUM LANTANA	WAYFARING TREE
VIBURNUM OPULUS	GUELDER ROSE

Somerset Notable Species underlined (most recent date where shown)

HIGHER PLANTS

ACHILLEA MILLEFOLIUM	YARROW
ADOXA MOSCHATELLINA	MOSCHATEL
AGRIMONIA EUPATORIUM	COMMON AGRIMONY
AGRIMONIA ODORATA	FRAGRANT AGRIMONY (1961)
AJUGA REPTANS	BUGLE
ALCHEMILLA VULGARIS	LADY'S MANTLE (1978)
ALLIARIA PETIOLATA	GARLIC MUSTARD
ALLIUM URSINUM	RAMSONS
ANEMONE NEMOROSA	WOOD ANEMONE
ANGELICA SYLVESTRIS	ANGELICA
ANTHRISCUS SYLVESTRIS	COW PARSLEY
APHANES ARVENSIS	PARSLEY-PIERT
APIUM NODIFLORUM	FOOL'S WAATERCRESS
AQUILEGIA VULGARIS	COLUMBINE (Rare but not Somerset Notable-Native status
ARCTIUM LAPPA	GREAT BURDOCK uncertain)
ARCTIUM MINUS	LESSER BURDOCK
ARCTIUM NEMOROSA	WOOD BURDOCK
ARUM MACULATUM	LORDS AND LADIES
BELLIS PERENNIS	DAISY
BLACKSTONIA PERFOLIATA	YELLOWWART
BUDDLEIA DAVIDII	BUDDLEIA
CALTHA PALUSTRIS	MARSH MARIGOLD
CALYSTEGIA SEPIUM	HEDGE BINDWEED
CAMPANULA TRACHELIUM	NETTLE-LEAVED BELL FLOWER (1990)
CARDAMINE FLEXOSA	WAVY BITTERCRESS
CARDAMINE IMPATIENS	NARROW-LEAVED BITTERCRESS (1979)
CARDAMINE PRATENSIS	CUCKOO FLOWER
CARDUS ACANTHOIDES	WELTED THISTLE
CENTAUREA NIGRA	LESSER KNAPWEED
CERASTIUM HOLOSTEOIDES	COMMON MOUSE-EAR
CHAMERION ANGUSTIFOLIUM	ROSEBAY WILLOWHERB
CHRYSANTHEMUM LEUCANTHEMUM	OX-EYE DAISY
CHRYSOPLENIUM OPPOSITIFOLIUM	OPPOSITE-LEAVED GOLDEN SAXIFRAGE
CIRCAEA LUTETIANA	ENCHANTER'S NIGHTSHADE
CIRCIUM ARVENSE	CREEPING THISTLE
CIRCIUM ERIOPHORUM	WOOLLY THISTLE (1985)
CIRCUIM PALISTRE	MARCH THISTLE
CIRCIUM VULGARE	SPEAR THISTLE
CLINOPODIUM VULGARE	WILD BASIL
COLCHICUM AUTUMNALE	MEADOW SAFFRON (1999)
CONOPODIUM MAJUS	PIGNUT
CONVALARIA MAJALIS	LILY OF THE VALLEY (1999)
DACTYLORHIZA FUCHSII	COMMON SPOTTED ORCHID
DIGITALIS PURPUREA	FOXGLOVE
DIPSACUS PILLOSUS	SMALL TEASEL(SHEPHERD'S ROD) (1983)

ELODEA CANADENSIS	CANADIAN PONDWEED
ENDYMION NON-SCRIPTUS	BLUEBELL
EPILOBIUM ADENOCAULON	AMERICAN WILLOWHERB
EPILOBIUM HIRSUTUM	GREATER HAIRY WILLOWHERB
EPILOBIUM MONTANUM	BROAD-LEAVED WILLOWHERB
EPILOBIUM ROSEUM	PALE WILLOWHERB
EPIPACTIS HELLEBORINE	BROAD-LEAVED HELLEBORINE (1983)
ERIGERON ACER	BLUE FLEAABANE
EUPHORBIA AMYFDALODIES	WOOD SPURGE (1999)
EUPHORBIA VILLOSA	HAIRYSPURGE (1960's? – Thought to be extinct in GB)
EUPHRASIA NEMOROSA	EYEBRIGHT
FILIPENDULA ULMARIA	MEADOWSWEET
FRAGRARIA VESCA	WILD STRAWBERRY
GALEOBDOLON LUTEUM	YELLOW ARCHANGEL
GALIUM APARINE	FOOSEGRASS
GALIUM CRUSSIATA	CROSSWORT (1955)
GALIUM ODRATUM	SWEET WOODRUFF
GALIUM MOLLUGO	HEDGE BEDSTRAW
GALIUM PALUSTRE	MARSH BEDSTRAW
GERANIUM COLUMBINUM	LONG-STALKED CRANSBILL
GERANIUM LUCIDUM	SHINNING CRANSBILL
GERANIUM DISSECTUM	CUT-LEAVED CRANSBILL
GERANUIM ROBERTIANUM	HERB ROBERT
GEUM RIVALE	WATER AVENS (1999)
GEUM RIVALE X URNANUM	HYBRID AVENS (1999)
GEUM URBANUM	WOOD AVENS 9HERB BENNET)
GLECHOMA HEDERACEA	GROUND IVY
GNAPHALIUM ULIGINOSUM	MARSH CUDWEED
GYMNADENIA CONOPSEA	FRAGRANT ORCHID(?)
HEDERA HELIX	IVY
HELLEBORUS FOETIDUS	STINKING HELLEBORE
HERACLEUM SPHONDYLIUM	HOGWEED
HIERACIUM MACULATUM	SPOTTED HAWKWEED
HIRACIUM SECT. VULGATA	COMMON HAWKWEED
HYPERICUM HIRSUTUM	HAIRY ST JOHN'S-WORT
HYPERICUM HUMIFUSUM	TRAILING ST JOHN'S-WORT
HYPERICUM MACULATUM	IMPERFORATE ST JOHN'S-WORT (1999)
HYPERICUM MONTANUM	PALE ST JOHN'S-WORT
HYPERICUM PULCHRUM	SLENDER ST JOHN'S-WORT
HYPERICUM TETRAPTERUM	SQUARE-STEMMED ST JOHN'S WORT
HYPOCHOERIS RADICATA	COMMON CAT'S-EAR
IRIS PSEUDACORUS	YELLOW FLAG
ISATIS TINCTORIA	WOAD (Very rare casual)
KNAUTIA ARVENSIS	FIELD SCABIOUS

LAMIASTRUM GALEOBDOLON	YELLOW ARCHANGEL
LANIUM ALBUM	WHITE DEADNETTLE
LAPSANA COMMUNIS	NIPPLEWORT
LATHRAEA SQUAMARIA	TOOTHWORT (1999)
LATHYRUS PRATENSIS	MEADOW VETCHLING
LINUM CATHARTICUM	FAIRY FLAX
LISTERA OVATA	TWAYBLADE
LITHOSPERMUM PURPUROCOERULEUM	PURPLE GROMWELL (1990)
LONICERA PERICYMENUM	HONEYSUCKLE
LOTUS CORNICULATUS	COMMON BIRD'S-FOOT TREFOIL
LOTUS ULIGINOSUS	MARSH BIRD'S-FOOT TREFOIL
LYCHNIS FLOS-CUCULI	RAGGED ROBIN
LYSIMACHIA NEMORUM	YELLOW PIMPERNELL
LYSIMACHIA NUMULARIA	CREEPING JENNY
MALVA MOSCHATA	MUSK MALLOW
MECONOPSIS CABRICA	WELSH POPPY
MEDICAGO LUPULINA	BLACK MEDICK
MENTHA AQUATICA	WATER MINT
MENTHA ARVENSIS	CORN MINT
MERCURIALIS PERENNIS	DOG'S MERCURY
MOEHRINGIA TRINERVA	THREE-VEINED SANDWORT
MYCELIS MURALIS	WALL LETTUCE
MYOSOTIS ARVENSIS	FIELD FORGET-ME-NOT
NARCISSUS PSEUDONARCISSUS	WILD DAFFODIL (1999)
NEOTTIA NIDUS-AVIS	BIRDS-NEST ORCHID (?)
OENANTHE CROCATA	HEMLOCK WATER DROPWORT
ORCHIS MASCULA	EARLY PURPLE ORCHID
OXALIS ACETOSELLA	WOOD SORREL
PARIS QUADRIFOLIA	HERB PARIS (1999)
PILOSELLA OFFICIANUM	MOUSE-EARED HAWKWEED
PLANTAGO LANCEOLATA	RIBWORT PLANTAIN
POLYGONATHUM MULTIFLORUM	COMMON SOLOMON'S SEAL (1999)
POLYGONATUM ODORATUM	ANGULAR SOLOMON'S SEAL (1999)
POTENTILLA ANSERINA	SILVERWEED
PONTENTILLA ERECTA	TORMENTIL
PONTENTILLA REPTANS	CREEPING CINQUEFOIL
POTENTILLA STERILIS	BARREN STRAWBERRY
PRIMULA VERIS	COWSLIP
PRIMULA VULGARIS	PRIMROSE
PRUNELLA VULGARIS	SELF-HEAL

RANUNCULUS AURICOMUS	GOLDILOCKS
RANUNCULUS FICARIA	LESSER CELANDINE
RANUNCULUS REPENS	CREEEPING BUTTERCUP
RIBES NIGRUM	BLACK CURRANT
RIBES UVA-CRISPA	GOOSEBERRY
ROSA CANINA	DOG ROSE
RUBUS CAESIUS	BRAMBLE spp (DEWBERRY)
RUBUS FRUTICOSUS	BRAMBLE
RUBUS IDAEUS	RASPBERRY
RUBUS SAXATILIS	STONE BRAMBLE
RUMEX ACETOSA	COMMON SORREL
RUMEX CONGLOMERATUS	CLUSTERED DOCK
RUMEX OBTUSIFOLIUS	BROAD-LEAVED DOCK
SAMOLUS VALERANDI	BROOKWEED
SANGLUISORBA MINOR	SALAD BURNET
SANICULA EUROPAEA	SANICLE
SCROPHULARIA AQUATICA	WATER FIGWORT
SCROPHULARIA NODOSA	COMMON FIGWORT
SEDUM ACRE	BITING STONECROP
SEDUM TELEPHIUM	ORPINE (1990)
SENECIO JACOBAEA	RAGWORT
SENECIO VULGARIS	GROUNDSEL
SILENE DIOICA	RED CAMPION
SISON AMONUM	STONE PARSLEY
SOLIDAGO VIRGAUREA	GOLDEN-ROD (1990)
SONCHUS ASPER	PRICKLY SOW-THISTLE
SONCHUS OLERACEUS	SMOOTH SOW-THISTLE
STACHYS ARVENSIS	FIELD WOUNDWORT
STACHYS SYLVATICA	HEDGE WOUNDWORT
STELLARIA ALSINE	BOG STITCHWORT
STELLARIA GRAMINEA	LESSER STITCHWORT
STELLARIA HOLOSTEA	GREATER STITCHWORT
STELLARIA MEDIA	COMMON CHICKWEED
TAMUS COMMUNIS	BLACK BRYONY
TARAXACUM OFFICINALE	DANDELION
TEUCRIUM SCORODONIA	WOOD SAGE
THYMUS PRAECOX	WILD THYME (1983)
TRIFOLIUM PRATENSE	RED CLOVER
TUSSILAGO FARFARA	COLT'S-FOOT
URTICA DIOICA	STINGING NETTLE

VALERIANA DIOICA	MARSH VALERIAN (1999)
VALERIANA OFFICINALIS	VALERIAN
VERBASCUM THAPUS	GREAT MULLEIN
VERONICA BECCABUNGA	BROOKLIME
VERONICA CHAMAEDRYS	GERMANDER SPEEDWELL
VERONICA MONTANA	WOOD SPEEDWELL
VERONICA OFFICINALIS	HEATH SPEEDWELL
VERONICA PERSICA	LARGE FIELD SPEEDWELL
VERONICA SERPYLLIFOLIA	THYME-LEAVED SPEEDWELL
VICIA LUTEA	YELLOW VETCH (1912 –thought to be extinct in Som.)
VICIA OROBUS	UPRIGHT VETCH (1999)
VICIA SATIVA	COMMON VETCH
VICIA SEPIUM	BUSH VETCH
VICIA SYLVATICA	WOOD VETCH (1999)
VIOLA REICHENBACHIANA	WOOD VIOLET
VIOLA RIVINIANA	COMMON VIOLET

GRASSES, SEDGES AND RUSHES

AGROSTIS STOLONIFERA	CREEPING BENT
ALOPERCURUS PRATENSE	MEADOW FOXTAIL
ANTHOXANTHUM ODORATUM	SWEET VERNAL GRASS
ARRHENANTHERUM ELATUS	FLASE OAT-GRASS
BRACHYPODIUM SYLVATICUM	FALSE BROME
BROMUS ERECTUS	UPRIGHT BROME
BROMUS RAMOSUS	HAIRY BROME
CAREX ACUTIFORMIS	LESSER POND SEDGE (1999)
CAREX FLACCA	GLAUCOUS SEDGE
CAREX PALLENSCENS	PALE SEDGE (1990)
CAREX PENDULA	PENDULOUS SEDGE
CAREX REMOTA	REMOTE SEDGE
CAREX STRIGOSA	THIN-SPIKED WOOD SEDGE
CAREX SYLVATICA	WOOD SEDGE
DACTYLIS GLOMERATA	COCK'S-FOOT
DESCHAMPSIA CAESPITOSA	TUFTED HAIR-GRASS
DESCHAMPSIA FLEXUOSA	WAVY HAIR GRASS
ELYMUS CANINUS	BEARDED COUCH
HOLCUS LANATUS	YORKSHIRE FOG
HOLCUS MOLLIS	CREEPING SOFT-GRASS
JUNCUS CONGLOMERATUS	COMPACT RUSH
JUNCUS EFFUSUS	SOFT RUSH
JUNCUS INTRAFLEXUS	HARD RUSH
LOLIUM PERENEE/P	COMMON RYE-GRASS
LUZULA CAMPESTRIS	FIELD WOOD-RUSH
LUZULA MULTIFLORA	HEATH WOOD-RUSH
LUZULA PILOSA	HAIRY WOOD-RUSH
MELICA UNIFLORA	WOOD MELICK
MILIUM EFFUSUM	WOOD MILLET
POA NEMORALIS	WOODLAND MEADOW-GRASS
POA TRIVIALIS	ROUGH MEADOW-GRASS

FERNS

ASPLENIUM CETERACH	RUSTY-BARN FERN
ASPLENIUM RIUTE-MARARIA	WALL-RUE
ASPLENIUM TRICHOMANES	MAIDENHAIR SPLEENWORT
ATHYRIUM FILIX-FEMINA	LADY FERN
BLECHNUM SPICANT	HARD FERN
CYSTOPTERIS FRAGILIS	BRITTLE BLADDER FERN
DRYOPTERIS AFFINIS	SCALY MALE FERN
DRYOPTERIS CARTHUSIANA	NARROW BUCKLER FERN (1983)
DRYOPTERIS DILATATA	BROAD BUCKLER FERN
DRYOPTERIS FILIX-MAS	MALE FERN
OPHIOGLOSSIUM VULGATUM	ADDER'S-TONGUE (1999)
PHYLLITUS SCOLOPENDRIUM	HART'S-TONGUE FERN
POLYPODIUM VULGARE	COMMON POLYPODDY
POLYSTICHUM ACULEASTUM	HARD SHIELD-FERN (1990)
POLYSTICHUM SETIFERUM	SOFT SHIELD -FERN
PTERIDIUM AQUILINUM	BRACKEN

BRYOPHYTES (NOTABLE SPECIES ONLY)

BRYUM CREBERRIMUM (1980)

FUNGI (NOTABLE SPECIES ONLY)

BUGLOSSOPORUS PULVINUS (1980)
GEASTRUM RUFESCENS (1977)
GEASTRUM TRIPLEX (1980)
HYGROPHORUS ARBUSTIVUS (1995)
LACTARIUS MAIREI (1995)
LEPIOTA PSEUDOFELINA (1980)
LIMACELLA GUTTATA (1982)
MELANOPHLLUM EYREI (1980)
PULCHERRICUM CAERULEUM (1980)
RHODOTUS PALMATUS (1983)

FAUNA

MAMMALS

APODEMUS SYLVATICUS	WOOD MOUSE
CAPREOLUS CAPREOLUS	ROE DEER
LEPUS CAPENSIS	BROWN HARE (1999)
LUTRA LUTRA	OTTER (1922)
MELES MELES	BADGER (1999 – active sett)
MUNTIACUS REEVESI	MUNTJAC DEER
MUSCARDINUS AVELLANARIUS	DORMOUSE (1999)
ORYCTOLAGUS CUNICULUS	RABBIT
RHINOLOPHUS FERRUMEQUINUM	GREATER HORSESHOE BAT (Roost Immediately adjacent to the wood – Assumed to use the site for hunting)
SCIURUS CAROLINENSIS	GREY SQUIRREL
SOREX ARARNEUS	COMMON SHREW (1999)
TALPA EUROPAEA	MOLE
VULPES VULPES	FOX

REPTILES and AMPHIBIANS

NATRIX NATRIX	GRASS SNAKE (1984)
TRITURIS VULGARIS	SMOOTH NEWT (1999)

BIRDS

ACCIPTOR NICUS	SPARROWHAWK
AEGITHALOS CAUDATUS	LONG-TAILED TIT
ALAUDA ARVENSIS	SKYLARK
ALECTORIS RUFA	RED-LEGGED PARTRIDGE
ANAS CRECCA	TEAL
ANAS PLATY RHYNCHOS	MALLARD
ANAS PRATENSIS	MEADOW PIPIT
APUS APUS	SWIFT
ATHENE NOCTUA	LITTLE OWL
BUTEO BUTEO	BUZZARD
CARDUELIS CARDUELIS	GOLDFINCH
CARDUELIS CHLORIS	GREENFINCH
CARDUELIS FLAMMEA	REDPOLL
CARDUELIS SPINUS	SISKIN
CERTHIA FAMILIARIS	TREECREEPER
CINCLUS CINCLUS	DIPPER
COLUMBA OENAS	STOCK DOVE
COLUMBA PALUMBUS	WOODPIGEON
CORVUS CORONE	CARRION CROW
CORVUS FRUGILEGUS	ROOK
CORVUS MONEDULA	JACKDAW
CUCLUS CANORUS	CUCKOO
CYGNUS OLOR	MUTE SWAN
DELICHON URBICA	HOUSE MARTIN
DENDROCOPUS MAJOR	GREAT SPOTTED WOODPECKER
DENDROCOPUS MINOR	LESSER SPOTTED WOODPECKER (B – 1968)
EMBERIZA CITRINELLA	YELLOWHAMMER
ERITHACUS RUBECULA	ROBIN
FALCO TINNUNCULUS	KESTREL
FRINGILLA COELEBS	CHAFFINCH
FULICA ATRA	COOT
GALLINAGO GALLINAGO	SNIPE
GALLINULA CHLOROPIS	MOORHEN
GARRULUS GLANDARIS	JAY
HIRUNDO RUSTICO	SWALLOW
LARUS CANUS	COMMON GUL
LARUS FUSCUS	LESSER BLACK-BACKED GULL
LARUS RIDIBUNDUS	BLACK-HEADED GULL
LUSCINIA MEGARHYNCHOS	NIGHTINGALE (A – 1982)
MOTACILLA ALBA	PIED WAGTAIL
MOTACILLA CINEREA	GREY WAGTAIL
MUSCICAPA STRIATA	SPOTTED FLYCATCHER

NUMENIUS ARQUATA	CURLEW
PARUS CAERULEUS	COAT TIT
PARUS MAJOR	GREAT TIT
PARUS MONTANUS	WILLOW TIT (B - 1982)
PARUS PALUSTRIS	MARSH TIT (B - 1999)
PHASIANUS COLCHICUS	PHEASANT
PHYLLOSCOPUS COLLYBITA	CHIEF CHIEF
PHYLLOSCOPUS TROCHILUS	WILLOW WARBLER
PICA PICA	MAGPIE
PICUS VIRIDIS	GREEN WOODPECKER
PLUVIALIS APRICARIA	GOLDEN PLOVER
PRUNELLA MODULARIS	DUNNOCK
PYRRHULA PYRRHULA	BULLFINCH
RALLUS AQUATICUS	WATER RAIL (1967)
REGULUS REGULUS	GOLDCREST
SCOLOPAX RUSTICOLA	WOODCOCK (B - 1990)
SITTA EUROPAEA	NUTHATCH
STREPTOPELIA TURTUR	TURTLE DOVE (B - 1968)
STRIX ALUCO	TAWNY OWL
STURNUS VULGARIS	STARLING
SYLVIA ATRICAPILLA	BLACKCAP
SYLVIA BORIN	GARDEN WARBLER
SYLVIA COMMUNIS	WHITETHROAT
SYLVIA CURRACA	LESSER WHITETHROAT
TACHYBAPTUS RUFICOLLIS	LITTLE GREBE
TROGLODYTES TROGLODYTES	WREN
TURDUS ILIACUS	REDWING
TURDUS PHILOMELOS	SONG THRUSH
TURDUS PILARIS	FIELDFARE
TURDUS VISCIVORUS	MISTLE THRUSH
TYTO ALBA	BARN OWL
VANELLA VANELLUS	LAPWING

BUTTERFLIES

AGLAIS URTICAE	SMALL TORTOISESHELL
ANTHOCHARIS CARDAMINES	ORANGE TIP
APHANTOPUS HYPERANTUS	RINGLET
ARGYNNIS PAPHIA	SILVER-WASHED FRITILLARY
BOLORIA EUPHROSYNE	PEARL-BORDERED FRITILLARY (1952)
BOLORIA SELENE	SMALL PEARL-BORDERED FRITILLARY (1930)
CELASTRINA ARGIOLUS	HOLLY BLUE
COENYMPHA PAMPHILUS	SMALL HEATH
COLIAS CRUCEUS	CLOUDED YELLOW
CYNTHIA CARDUI	PAINTED LADY
ERYMIS TAGES	DINGY SKIPPER (1999)
GONOPTERYX RHAMNI	BRIMSTONE
INACHIS IO	PEACOCK
LASIOMMATA MEGERA	WALL BROWN
LEPTIDEA SINAPIS	WOOD WHITE (Extinct?)
LYCAENA PHLAEAS	SMALL COPPER
MANIOLA JURTINA	MEADOW BROWN
PARARGE AEGERIA	SPECKLED WOOD
PIERIS BRASSICAE	LARGE WHITE
PIERIS NAPI	GREEN-VIENED WHITE
PIERIS RAPAE	SMALL WHITE
POLYGONIA C-ALBUM	COMMA
POLYOMMATUS ICARUS	COMMON BLUE
PYRGUS MALVAE	GRIZZLED SKIPPER (1999)
QUERCUSIA QUERCUS	PURPLE HAIRSTREAK
STRYMONIDIA W-ALBUM	WHITE LETTER HAIRSTREAK (1930)
VANESSA ATALANTA	RED ADMIRAL

OTHER INVERTEBRATES (NOTABLE SPECIES ONLY)

MOTHS

CYCLOPHORA ANNULATA	THE MOCHA	Nb
DISCOLOXIA BLOMERI	BLOMER'S RIVULET	Nb
MINOA MURINATA	DRAB LOOPER	Nb
COSMIA DIFFINIS	WHITE-PINION SPOTTED	Nb
ATOLMIS RUBRICOLLIS	RED-NECKED FOOTMAN	Nb

GRASSHOPPERS

OMOCESTUS RUFIPES	WOODLAND GRASSHOPPER (Leighton hanging)	

FLIES

CHALCOSYRPHUS NEMORUM	Nr DW3
CHRYSOTOXUM BICINCTUM	Nr
CRIORHINA ASILICA	Nb DW2
CRIORHINA BERBERINA	Nb DW3
CRIORHINA RANUNCULI	Nb DW2
EPISTROPHE GROSSULARIAE	DW3
KYLOTA SYLCARUM	DW3
MELAGYNA UMBELLATARUM	Nr
FERDINANDEA CUPREA	DW3
PIPZA AUSTRIACA	Nr
VOLUCELLA INFLATA	Nb DW2

BEETLES

BEMBIDION NITIDULUM	
PTEROSTICHUS OBLONGOPUNCTATUS	Nb

SNAILS

ACICULA FUSCA		
ENA MONTANA	MOUNTAIN BULIN SNAIL	RDB3
ZENOBELIA SUBRUFESCENS		

CRUSTACEANS

AUSTROPOTAMOBIUS PALLIPES	WHITE-CLAWED CRAYFISH (Extinct?)

Appendix 3

Asham Wood Management Plan (Archaeology)

Compartment/ worked area	Site	Man plan ref	SCC ref	action
1 80%	Embanked pool ST706462		(29296)P Stokes letter, site E,	Confirm location; 13.11.14 not visited
6 100%	Robbed out stone feature	'J'	No record	Confirm location/source; 13.11.14 dense scrub; not located; remove scrub & survey at later date
7 75%	BA barrow	'F'	32627	Visited 13.11.14 Clear of remaining scrub & tree cover
7 75%	Holloway		32670	Not seen on 13.11.14 visit. Mapped as continuing from compartment 15. Care during clearance operations – no infill or tracking over.
8 100%	BA barrow	'G'	12162	Visited 13.11.14 Dense scrub cover, number of semi mature trees; remove scrub & trees by hand & survey at later date
9 100%	Barrow/mound	'H'	PRN 12163 'mounds'; ST 7080 4594	Visited 13.11.14 - dense scrub. Locate during clearance of scrub & tree cover; allow access for archaeological survey.
9 100%	Barrow/mound	'I'	PRN 12163; ST 7085 4598	Visited 13.11.14 - dense scrub. Locate during clearance of scrub & tree cover; allow access for archaeological survey.
10 100%	Wrong grid ref for 12162		PRN 12162;	*agree management with SCC archaeologist (this is probably the one in coup 8 but with grid ref error)* No management needs.
15 <10%	leats	'C'	32626	13.11.14 not visited.
15 <10%	holloway		32670	Not seen in this compartment on visit 13.11.14 – mapped as continuing from compartment 19 and into compartment 7.
15 <10%	Earthwork enclosure (Roman)	'D'	PRN 32667 (also in compt 20)	Visited 13.11.14. Stable condition, not scrubbed over; no vehicles during felling operations as the low banks would be easily damaged. Some thinning could be carried out but need to maintain the canopy to keep scrub at

				current level.
15 <10%	Earthwork enclosure (northern enclosure)	'E'	PRN 12157, enclosure	Visited 13.11.14. Stable condition, not scrubbed over; no vehicles during felling operations as the low banks would be easily damaged. Some thinning could be carried out but need to maintain the canopy to keep scrub at current level.
16 70%	Buckenham's Well	'B'	No record	Confirm location/survival; not located during visit 13.11.14 - avoid area during felling operations
17 <10%	Farmhouse buildings	'A'	Site added to HER; no. 32669	Visited 13.11.14 Walling located at ST7032546503; stable condition. Remove scrub manually.
19 <10%	Holloway		Site added to HER; no 32670 Mapped as continuing through compts 15 & 7, but not seen in these locations due to scrub cover.	Seen during 13.11.14 visit, running uphill to SW of stream. Stable condition, no action recommended
20 <10%	Earthwork enclosure (Roman)	'D'	PRN 32667 (also in compt 15)	Visited 13.11.14. Stable condition, not scrubbed over; no vehicles during felling operations as the low banks would be easily damaged. Some thinning could be carried out but need to maintain the canopy to keep scrub at current level.
22 <10%	earthworks		PRN 18603; ST7036 4512	Avoid area during felling operations

Jan Grove, 18.11.14

Historic Environment Service

South West Heritage Trust

12,158
12,049
28,135
16,475
32,627
12,162
12,157
12,063
12,048
18,889
28,865
23,432
23,907
18,890
28,855
18,603
25,672
28,861
18,996
24,773
18,743
17,752
32,119
24,774
22,047

Appendix C
HEP calculations for greater and lesser horseshoe bats

Greater Horseshoe Bats HEP Worksheet

Field No	Habitat	Primary Habitat Code	Primary Habitat Score	Matrix Code	Matrix Score	Formation Code	Formation Score	Management / Land use Code	Management / Land use Score	HSI Score	Density Band Score	Hectares	Habitat Units	Species / Notes	Band
	Broadleaved woodland		6		0		1.00		1.00	6.00	2.5	1.457559	21.86	A1.1.1: Broadleaved woodland - semi-natura	B
	Scrub woodland		1		0		1.00		1.00	1.00	2.5	2.470787	6.18	A2.1: Scrub- Dense/Continous	B
	Semi-improved grassland		4		1		1.00		1.00	5.00	2.5	1.887853	23.60	A2.2: Scrub- Scattered	B
	Semi-improved grassland		4		0		1.00		1.00	4.00	2.5	0.377066	3.77	A3.1: Parkland and scattered trees- broad-le	B
	Semi-improved grassland		4		0		1.00		1.00	4.00	2.5	0.380566	3.81	B2.2: Neutral grassland - semi-improved	B
	Calcareous grassland		6		0		1.00		1.00	6.00	2.5	0.537057	8.06	B3.1: Calcareous grassland - unimproved	B
	Semi-improved grassland		4		0		1.00		1.00	4.00	2.5	0.054315	0.54	C3.1: Tall ruderal	B
	Non-important hedgerows		5		0		1.00		1.00	5.00	2.5	0.279822	3.50	Defunct hedge native species poor	B
	Hedges/Lines of Trees		6		0		1.00		1.00	6.00	2.5	0.496654	7.45	Defunct hedge native species rich	B
	Non-important hedgerows		5		0		1.00		1.00	5.00	2.5	0.100412	1.26	Hedge and trees native species poor	B
	Important hedgerows		6		0		1.00		1.00	6.00	2.5	0.028208	0.42	Intact hedge native species poor	B
	Hedges/Lines of Trees		6		0		1.00		1.00	6.00	2.5	0.361586	5.42	Intact hedge native species rich	B
	Arable and horticulture		1		0		1.00		1.00	1.00	2.5	33.82948	84.57	J1.1: Arable	B
	Semi-improved grassland		4		0		1.00		1.00	4.00	2.5	1.682984	16.83	J1.3: Ephemeral/short perennial	B
	Housing/Domestic Outbuildings		1		0		1.00		1.00	1.00	2.5	0.115798	0.29	J3.6: Buildings	B
	Quarry		2		0		1.00		1.00	2.00	2.5	0.929262	4.65	J4: Bare ground	B
	Semi-improved grassland		4		1		1.00		1.00	5.00	2.5	0.029295	0.37	Scattered scrub	B
	Broadleaved woodland		6		0		1.00		1.00	6.00	2.5	0.783853	11.76	A1.1.1: Broadleaved woodland - semi-natura	B
	Scrub woodland		1		0		1.00		1.00	1.00	2.5	1.097992	2.74	A2.1: Scrub- Dense/Continous	B
	Semi-improved grassland		4		-3		1.00		1.00	1.00	2.5	6.274495	15.69	A2.2: Scrub- Scattered	B
	Semi-improved grassland		4		0		1.00		1.00	4.00	2.5	0.099196	0.99	B2.2: Neutral grassland - semi-improved	B
	Calcareous grassland		6		0		1.00		1.00	6.00	2.5	0.204228	3.06	B3.1: Calcareous grassland - unimproved	B
	Other extended built environment		0		0		1.00		1.00	0.00	2.5	0.09554	0.00	Hardstanding	B
	Arable and horticulture		1		0		1.00		1.00	1.00	2.5	0.007139	0.02	J1.1: Arable	B
	Semi-improved grassland		4		0		1.00		1.00	4.00	2.5	6.662569	66.63	J1.3: Ephemeral/short perennial	B
	Quarry		1		0		1.00		1.00	1.00	2.5	1.11009	2.78	J4: Bare ground	B
	Quarry		1		0		1.00		1.00	1.00	2.5	8.63219	21.58	Additional area of habitat that will not be lost, but subject to habitat creation/restoration	B
												69.986			

Habitat Units	317.81
Hectares Required	**17.66**

Value from 'Replacement Habitat' worksheet

Equivalent Hectares Provided	**34.41**

Note: Where there is significant residual replacement habitat that cannot be accommodated within the proposed development site off site enhancement will be needed. The amount required will be increased by the value of the existing habitat on the receptor site (see A5.54 in the Technical Guidance)

If required, Value from Receptor Habitat Worksheet

Equivalent Hectares of Existing Habitat on Receptor	**3.12**

If deficit then further input is required into either 'Replacement Habitat' and/or Off-site Replacement Habitat' worksheets until an equal or gain is provided. (Non-significant amounts of loss need to be agreed with planning authority ecologist)

Gain/ Deficit	**13.63**

Greater Horseshoe Bats Replacement Habitat

Habitat	Primary Habitat		Matrix		Formation		Management /		HSI Score	Hectares	Delivery Risk	Temporal Risk	Spatial Risk		Equivalent Hectares
	IHS Code	Score	Code	Score	Code	Score	Code	Score					Development Site Band Score	Replacement Site Band Score	
Quarry		1		0		1.00		1.00	1.00	1.606899684	0.67	0.97	2.5	2.5	1.04
Calcareous grassland		6		1		1.00		1.00	7.00	10.67292787	0.67	0.70	2.5	2.5	35.04
Large lake		6		1		0.50		1.00	3.50	26.6386854	0.67	0.70	2.5	2.5	43.73
Broadleaved woodland		6		1		1.00		1.00	7.00	4.82829255	0.67	0.49	2.5	2.5	11.10
Semi-improved grassland		4		1		1.00		1.00	5.00	4.296793626	0.67	0.70	2.5	2.5	10.08
Calcareous grassland		6		1		1.00		1.00	7.00	7.246856051	0.67	0.70	2.5	2.5	23.79
Quarry		1		0		1.00		1.00	1.00	0.54578862	0.67	0.97	2.5	2.5	0.35
Semi-improved grassland		4		1		1.00		1.00	5.00	0.695935274	0.67	0.70	2.5	2.5	1.63
Broadleaved woodland		6		1		1.00		1.00	7.00	11.76652458	0.67	0.49	2.5	2.5	27.04
Broadleaved woodland		6		1		1.00		1.00	7.00	3.52	0.67	0.49	2.5	2.5	8.09
Large lake		6		1		0.50		1.00	3.50	0.187786429	0.67	0.70	2.5	2.5	0.31
Semi-improved grassland		4		1		1.00		1.00	5.00	17.2	0.67	0.70	2.5	2.5	40.33
Scrub woodland		1		1		1.00		1.00	2.00	2.5	0.67	0.49	2.5	2.5	1.64
Standing open water		6		1		1.00		1.00	7.00	0.5	0.67	0.70	2.5	2.5	1.64
Hedges / tree lines		6		1		1.00		1.00	7.00	0.19	0.67	0.70	2.5	2.5	0.62
										92.396					
					Value of Habitat Provided in Hectares										34.405

Greater Horseshoe Bats Receptor Habitat

Habitat	Primary Habitat		Matrix		Formation		Management / Land use		HSI Score	Development site	Receptor Site	Hectares	Equivalent Hectares
	IHS Code	Score	Code	Score	Code	Score	Code	Score		Density Band Score	Density Band Score		
Arable and horticulture		1		0		1.00		1.00	1.00	2.50	2.50	18.700	3.12
		0		0		1.00		1.00	0.00	1.00	1.00	0.000	0.00
		0		0		1.00		1.00	0.00	1.00	1.00	0.000	0.00
		0		0		1.00		1.00	0.00	1.00	1.00	0.000	0.00
											Equivalent Value of Habitat on Receptor Site		3.12

Use this sheet where some or all of the replacement habitat is not provided within the development site. The value of the exisitng off site habitat needs to be taken away from the value of that provided.

Field No	Habitat	Primary Habitat		Matrix		Formation		Management / Land use		HSI Score	Density Band Score	Hectares	Habitat Units	Species / Notes	Band
		Code	Score	Code	Score	Code	Score	Code	Score						
	Broadleaved woodland		6		0		1.00		1.00	6.00	3.0	1.457559	26.24	A1.1.1: Broadleaved woodland - semi-natura	A
	Scrub woodland		1		0		1.00		1.00	1.00	3.0	2.470787	7.41	A2.1: Scrub- Dense/Continous	A
	Semi-improved grassland		3		1		1.00		1.00	4.00	3.0	1.887853	22.65	A2.2: Scrub- Scattered	A
	Semi-improved grassland		3		1		1.00		1.00	4.00	3.0	0.377066	4.52	A3.1: Parkland and scattered trees- broad-le	A
	Semi-improved grassland		3		0		1.00		1.00	3.00	3.0	0.380566	3.43	B2.2: Neutral grassland - semi-improved	A
	Calcareous grassland		3		0		1.00		1.00	3.00	3.0	0.537057	4.83	B3.1: Calcareous grassland - unimproved	A
	Semi-improved grassland		3		0.25		1.00		1.00	3.25	3.0	0.054315	0.53	C3.1: Tall ruderal	A
	Non-important hedgerows		5		0		1.00		1.00	5.00	3.0	0.279822	4.20	Defunct hedge native species poor	A
	Hedges/Lines of Trees		6		0		1.00		1.00	6.00	3.0	0.496654	8.94	Defunct hedge native species rich	A
	Non-important hedgerows		5		0		1.00		1.00	5.00	3.0	0.100412	1.51	Hedge and trees native species poor	A
	Important hedgerows		6		0		1.00		1.00	6.00	3.0	0.028208	0.51	Intact hedge native species poor	A
	Hedges/Lines of Trees		6		0		1.00		1.00	6.00	3.0	0.361586	6.51	Intact hedge native species rich	A
	Arable and horticulture		1		0		1.00		1.00	1.00	3.0	33.82948	101.49	J1.1: Arable	A
	Semi-improved grassland		3		0		1.00		1.00	3.00	3.0	1.682984	15.15	J1.3: Ephemeral/short perennial	A
	Housing/Domestic Outbuildings		0.1		0		1.00		0.10	0.01	3.0	0.115798	0.00	J3.6: Buildings	A
	Quarry		2		0		1.00		1.00	2.00	3.0	0.929262	5.58	J4: Bare ground	A
	Semi-improved grassland		3		1		1.00		1.00	4.00	3.0	0.029295	0.35	Scattered scrub	A
	Broadleaved woodland		6		1		1.00		1.00	6.00	2.5	0.783853	11.76	A1.1.1: Broadleaved woodland - semi-natura	B
	Scrub woodland		1		1		1.00		1.00	2.00	2.5	1.097992	5.49	A2.1: Scrub- Dense/Continous	B
	Semi-improved grassland		3		1		1.00		1.00	4.00	2.5	6.274495	62.74	A2.2: Scrub- Scattered	B
	Semi-improved grassland		3		1		1.00		1.00	4.00	2.5	0.099196	0.99	B2.2: Neutral grassland - semi-improved	B
	Calcareous grassland		3		1		1.00		1.00	4.00	2.5	0.204228	2.04	B3.1: Calcareous grassland - unimproved	B
	Other extended built environment		0		0		1.00		1.00	0.00	2.5	0.09554	0.00	Hardstanding	B
	Arable and horticulture		1		0		1.00		1.00	1.00	2.5	0.007139	0.02	J1.1: Arable	B
	Semi-improved grassland		3		0		1.00		1.00	3.00	2.5	6.662569	49.97	J1.3: Ephemeral/short perennial	B
	Quarry		2		0		1.00		1.00	2.00	2.5	1.11009	5.55	J4: Bare ground	B
	Quarry		2		0		1.00		1.00	2.00	2.5	8.63219	43.16	Additional area of habitat that will not be lost, but subject to habitat creation/restoration	B
												69.986			
											Habitat Units		395.57		
											Hectares Required		**21.98**		

Value from 'Replacement Habitat' worksheet

Equivalent Hectares Provided	**27.46**

Note: Where there is significant residual replacement habitat that cannot be accommodated within the proposed development site off site enhancement will be needed. The amount required will be increased by the value of the existing habitat on the receptor site (see A5.54 in the Technical Guidance)

If required, Value from Receptor Habitat Worksheet

Equivalent Hectares of Existing Habitat on Receptor	**3.12**

If deficit then further input is required into either 'Replacement Habitat' and/or Off-site Replacement Habitat' worksheets until an equal or gain is provided. (Non-significant amounts of loss need to be agreed with planning authority ecologist)

Gain/ Deficit	**2.37**

Habitat	Primary Habitat		Matrix		Formation		Management /		HSI Score	Hectares	Delivery Risk	Temporal Risk	Spatial Risk		Equivalent Hectares			
	IHS Code	Score	Code	Score	Code	Score	Code	Score					Development Site Band Score	Replacement Site Band Score				
Quarry		2		0		1.00		1.00	2.00	1.606899684	0.67	0.97	3.0	3.0	2.08			
Calcareous grassland		3		1		1.00		1.00	4.00	10.67292787	0.67	0.70	3.0	3.0	20.02			
Large lake		5		1		0.50		1.00	3.00	26.6386854	0.67	0.70	3.0	3.0	37.48			
Broadleaved woodland		6		1		1.00		1.00	7.00	4.82829255	0.67	0.49	3.0	3.0	11.10			
Semi-improved grassland		3		1		1.00		1.00	4.00	4.296793626	0.67	0.70	3.0	3.0	8.06			
Scrub woodland		1		0		1.00		1.00	1.00	1.5	0.67	0.49	3.0	3.0	0.49			
Calcareous grassland		3		1		1.00		1.00	4.00	7.246856051	0.67	0.70	2.5	2.5	13.60			
Quarry		2		0		1.00		1.00	2.00	0.54578862	0.67	0.97	2.5	2.5	0.71			
Semi-improved grassland		3		1		1.00		1.00	4.00	0.695935274	0.67	0.70	2.5	2.5	1.31			
Broadleaved woodland		6		1		1.00		1.00	7.00	11.76652458	0.67	0.49	2.5	2.5	27.04			
Broadleaved woodland		6		1		1.00		1.00	7.00	3.52	0.67	0.49	2.5	2.5	8.09			
Large lake		5		1		0.50		1.00	3.00	0.187786429	0.67	0.70	2.5	2.5	0.26			
Semi-improved grassland		3		1		1.00		1.00	4.00	17.2	0.67	0.70	2.5	2.5	32.27	Additiona receptor habitat in adjacent field		
Scrub woodland		1		0		1.00		1.00	1.00	1	0.67	0.49	2.5	2.5	0.33	Additiona receptor habitat in adjacent field		
Standing open water		6		0		1.00		1.00	6.00	0.5	0.67	0.70	2.5	2.5	1.41	Additiona receptor habitat in adjacent field		
Hedges / tree lines		6		0		1.00		1.00	6.00	0.19	0.67	0.70	2.5	2.5	0.53	Additiona receptor habitat in adjacent field		
										92.396								
					Value of Habitat Provided in Hectares										27.461			

Lesser Horseshoe Bats Receptor Habitat

Habitat	Primary Habitat		Matrix		Formation		Management / Land use		HSI Score	Development site	Receptor Site	Hectares	Equivalent Hectares
	IHS Code	Score	Code	Score	Code	Score	Code	Score		Density Band Score	Density Band Score		
Arable and horticulture		1		0		1.00		1.00	1.00	2.50	2.50	18.700	3.12
		0		0		1.00		1.00	0.00	1.00	1.00	0.000	0.00
		0		0		1.00		1.00	0.00	1.00	1.00	0.000	0.00
		0		0		1.00		1.00	0.00	1.00	1.00	0.000	0.00
											Equivalent Value of Habitat on Receptor Site		**3.12**

Use this sheet where some or all of the replacement habitat is not provided within the development site. The value of the exisitng off site habitat needs to be taken away from the value of that provided.

Appendix D
Draft Heads of Terms for Section 106 Agreement relating to traffic

Heads of Terms template for S106 agreement

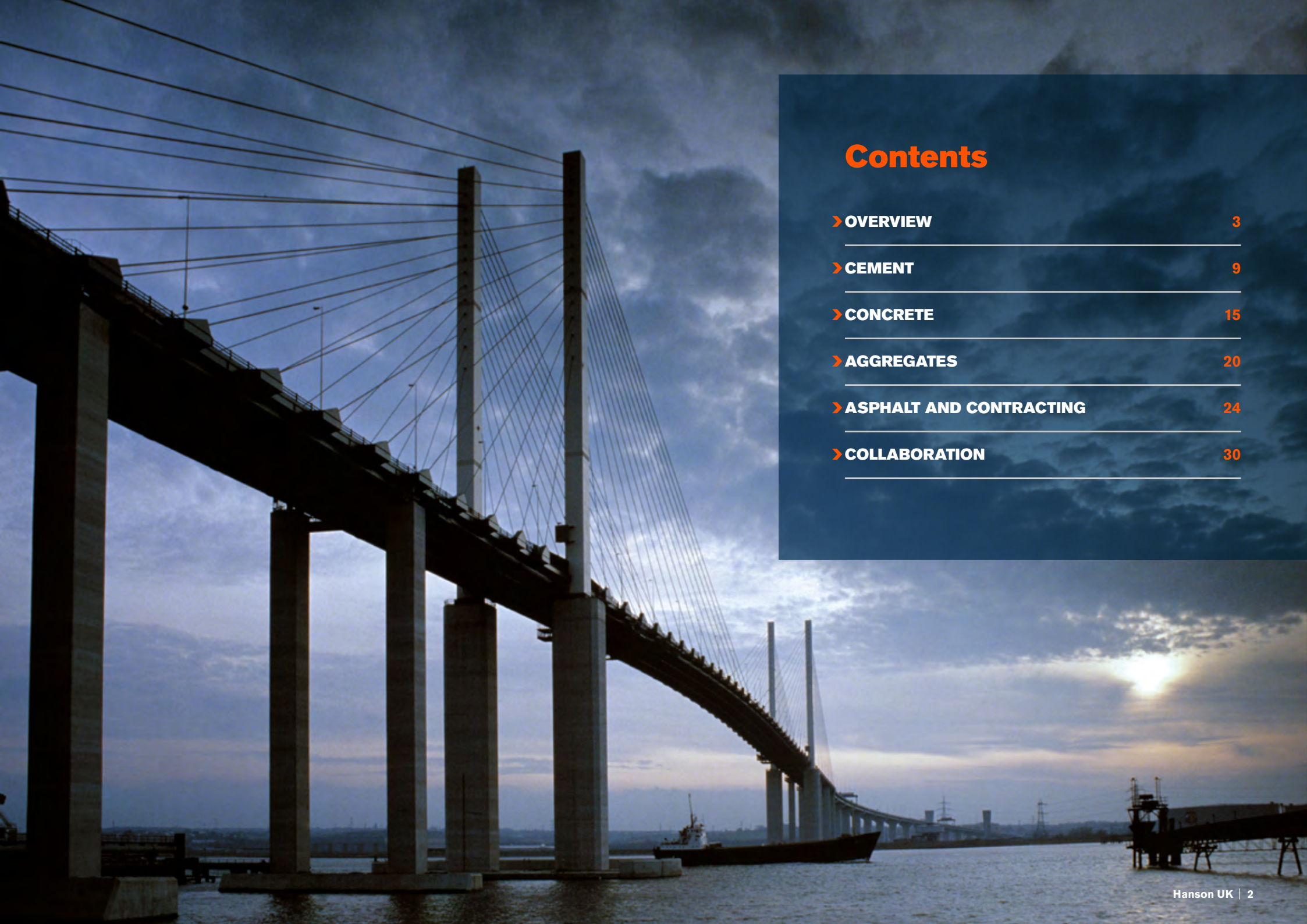
S106 of the Town and Country Planning Act (England) 1990 (as amended)

1. Locations of proposed development (address and postcode of the site) If there is no postal address, please give a clear and accurate description of the site location	Westdown Quarry, Nunney, Nr Frome, Somerset
2. Applicant(s) full name and address Please insert the **full name(s) and address(es)** of the persons submitting the planning application	Hanson Quarry Products Europe Limited Company Registration Number 00300002 Hanson House, 14 Castle Hill, Maidenhead SL6 4JJ
3. Is the applicant the legal owner of the application land?	**Yes** (delete as appropriate) If no: Please provide the legal owner's full name and address below:
4. If the applicant is not the owner, do they have an agreement to purchase the land? This is where the legal owner has entered into a contract with someone to sell the property and the third party has submitted the planning application and not the owner	N/A
5. Details of the agent dealing with this matter (if relevant); It is not necessary to have either an agent or solicitor dealing with this for you, however it is recommended	**Name:** Laura Swindells **Company:** Knights Professional Services Limited **Address:** The Brampton, Newcastle-under-Lyme, Staffordshire, ST5 0QW **Telephone:** 01782 619225 / 07436 106101 **Email:** laura.swindells@knightsplc.com

6. Details of the legal representative dealing with this matter (if relevant): It is not necessary to have either an agent or solicitor dealing with this for you, however, it is recommended	**Name:** Laura Swindells **Company:** Knights Professional Services Limited **Address:** The Brampton, Newcastle-under-Lyme, Staffordshire, ST5 0QW **Telephone:** 01782 619225 / 07436 106101 **Email:** laura.swindells@knightsplc.com
7. Title number If the property has been purchased within the last 25 years it will be registered with HM Land Registry and have a tile number, for example, LT123458 proving ownership. Please provide a copy of the register with a title plan	**Yes/no** (delete as appropriate) **To be confirmed** If yes, what is the title number: If no, please submit a copy of the title deeds with this form
8. Is there a mortgage or charge over the property? If any part of the property is charged or subject to a mortgage, your mortgage provider or charge holders must be a party to the agreement in order to give their consent to it. Your mortgage provider may charge a separate fee for approving and executing the agreement	**No** If yes, please provide details:
9. Details of obligation	Pursuant to condition 30 of consent reference 109122/002 dated 10 February 1995 for Whatley Quarry, the restriction as to no more than 4 million tonnes of the total output from Whatley Quarry in any one calendar year being transported by road shall be limited by way of a S106 planning obligation whereby the Owner will covenant that no more than 2 million tonnes of the total output in any one calendar year shall be transported by road from Westdown Quarry (with the remainder of up to 2 million tonnes being output from Whatley Quarry).

Appendix E
Hanson's 'Committed to reaching net zero carbon by 2050' and 'Carbon Capture Plan'


Hanson
HEIDELBERGCEMENT Group
COMMITTED TO REACHING
NET ZERO CARBON
BY 2050



Contents

OVERVIEW

Hanson makes essential materials to build our future and reaching net zero carbon by 2050 is a responsibility we take very seriously.

We are committed to fulfilling our role in meeting the UK government's ambitions and our parent company, HeidelbergCement Group, has signed the Business Ambition for 1.5°C Commitment and joined the UN's Race to Zero campaign.

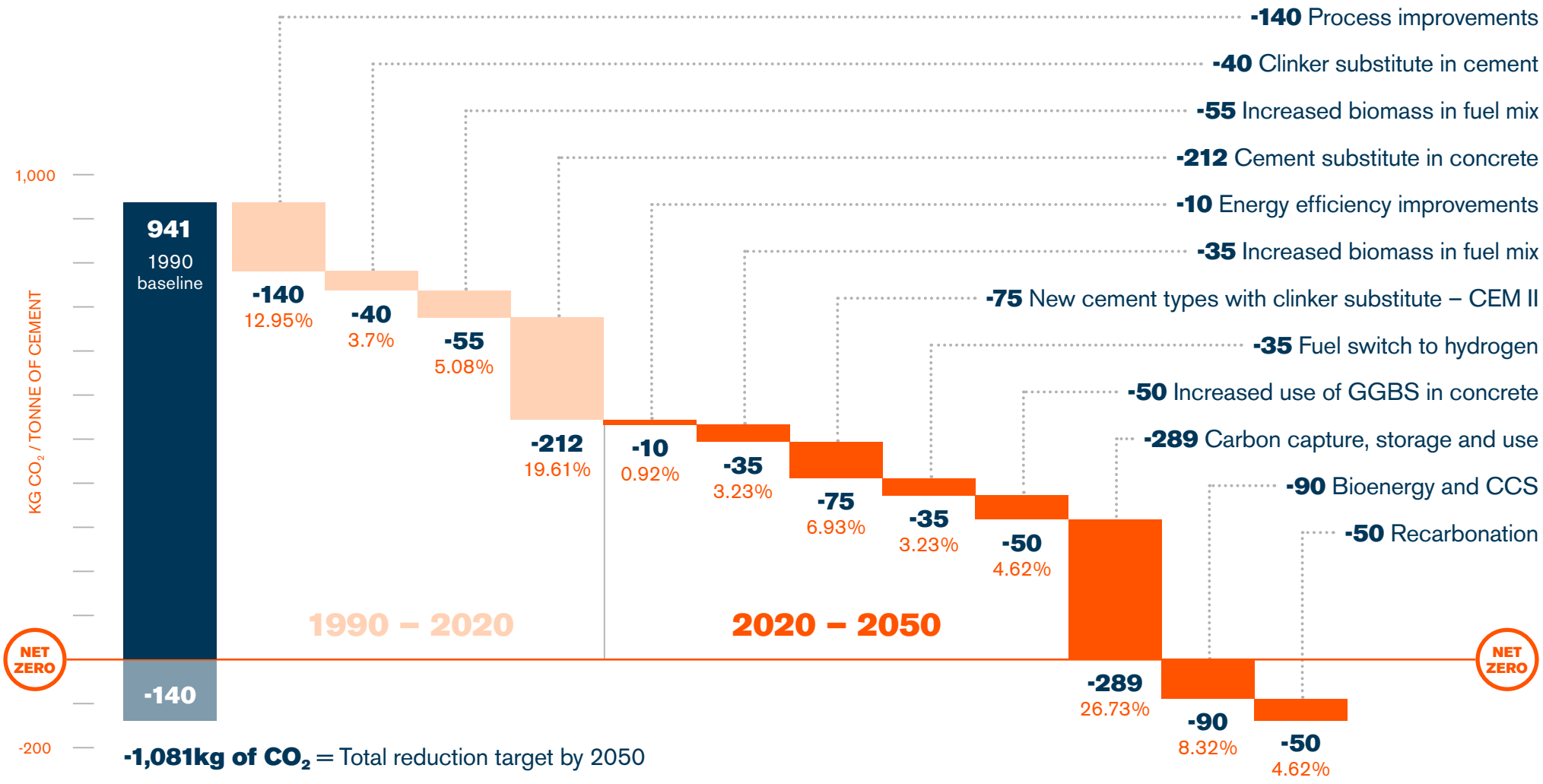
Our route to decarbonisation has been ongoing for many years and we have made significant headway. We have a roadmap in place, which includes a number of important areas that will help us achieve net zero. These include:

- Increased use of alternative raw materials and alternative fuels
- Carbon capture and storage
- Fuel switching to hydrogen
- Use of reduced CO_2 products
- Improvements in plant efficiency and processes across our operations.

Contents

Levers to reduce CO_2 in cement and concrete production

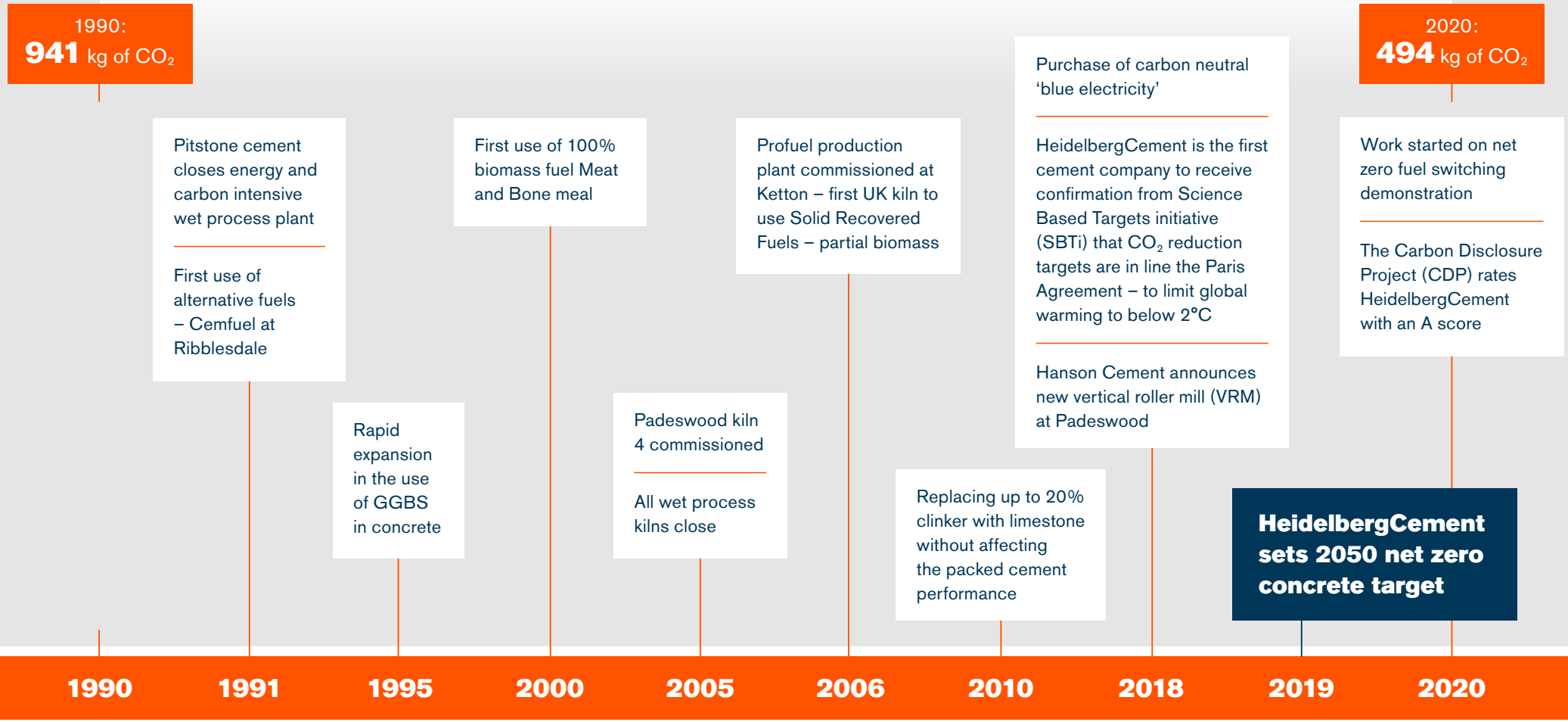
Committed to reaching net zero carbon by 2050



-1,081kg of CO_2 = Total reduction target by 2050

Key actions since 1990

Carbon emissions per tonne of cementitious material have almost halved between 1990 and 2020



Our actions today and what Hanson UK has planned

Fuel switching

- Researching the potential of hydrogen to reduce carbon emissions through switching from fossil fuels on an industrial scale
- If implemented at our Ribblesdale cement works, it could save…

↓ 180,000
tonnes of CO_2 per year

Green hydrogen

- Hydrogen generated through renewable energy
- Hydrogen demonstration unit installed at our Regen GGBS plant in Port Talbot
- Aim to replace a percentage of the natural gas that powers our plants

Yellow machines (mobile quarry plant) – conversion to HVO (hydrogenated vegetable oil) fuel and electrification of smaller vehicles

LGV (large goods vehicles) concrete delivery fleet – electrification transition begins

Carbon capture

- In partnership with the HyNet North West consortium, Hanson UK is aiming to create the world's first low carbon industrial cluster
- Potential to reduce emissions by 2030 at our Padeswood cement works by up to…

↓ 800,000
tonnes of CO_2 per year

H_2 fuel in larger quarry machines

LGV – H_2 in cement fleet as it's replaced

Asphalt

Drying – gas and oil burner replacements/conversion to H_2 (hydrogen) fuel as UK H_2 infrastructure develops

Levers for change

These six levers for change are driving projects that take us ever-closer to net zero by 2050.

- **Indirect emissions from decarbonised electricity**
- **Transport**
- **Low carbon cements and concretes**
- **Fuel switching**
- **Carbon capture, usage and storage (CCUS)**
- **Carbonation**

2021 | **2025** | **2030** | **2035** | **2050**

COMMITTED TO 50% OF VAN FLEET AND

100% OF CAR FLEET

BEING FULLY ELECTRIC OR HYBRID BY 2025

We are involved in several industry-leading carbon reduction projects at our cement works in the UK.

This includes developing carbon capture and storage (CCS) for our Padeswood site in Mold, as part of the HyNet North West project, to make net zero cement a reality.

We have also demonstrated the use of a net zero fuel mix using hydrogen and biomass at our Ribblesdale works in Lancashire.

Across the business, additional small thermal and efficiency improvements are still possible, despite the extensive activity in this area over the last three decades, and nearly all our electricity-use is already carbon-neutral.

We will also continue to explore the potential for new technologies to enable our transport and heavy machinery to be more efficient.

CEMENT


Hanson
HEIDELBERGCEMENT Group
Hanson
3.81 MTRS
3.81 MTRS
3.81 MTRS

SET TO BE THE

FIRST MANUFACTURER

TO PRODUCE NET ZERO CARBON CEMENT BY 2030

Since 1990, we made excellent progress in reducing the CO_2 emissions associated with cement production.

This is a key focus for us as cement production is energy-intensive and the source of most of our CO_2 emissions.

Around 70% of these emissions arise from the calcination process (the chemical reactions that take place in the process to produce clinker) and we are actively developing an industry-leading carbon capture and storage project that removes these process emissions.

The remaining emissions are from the fuels used to power the kilns and we are working on projects to switch from fossil fuels to carbon neutral sources, including hydrogen.

We have also reduced emissions by using CO_2 captured from the stack at our Ketton cement works to mineralise bypass dust.

We are currently involved in several industry-leading projects, including carbon capture and storage at our Padeswood plant.

We have also demonstrated:

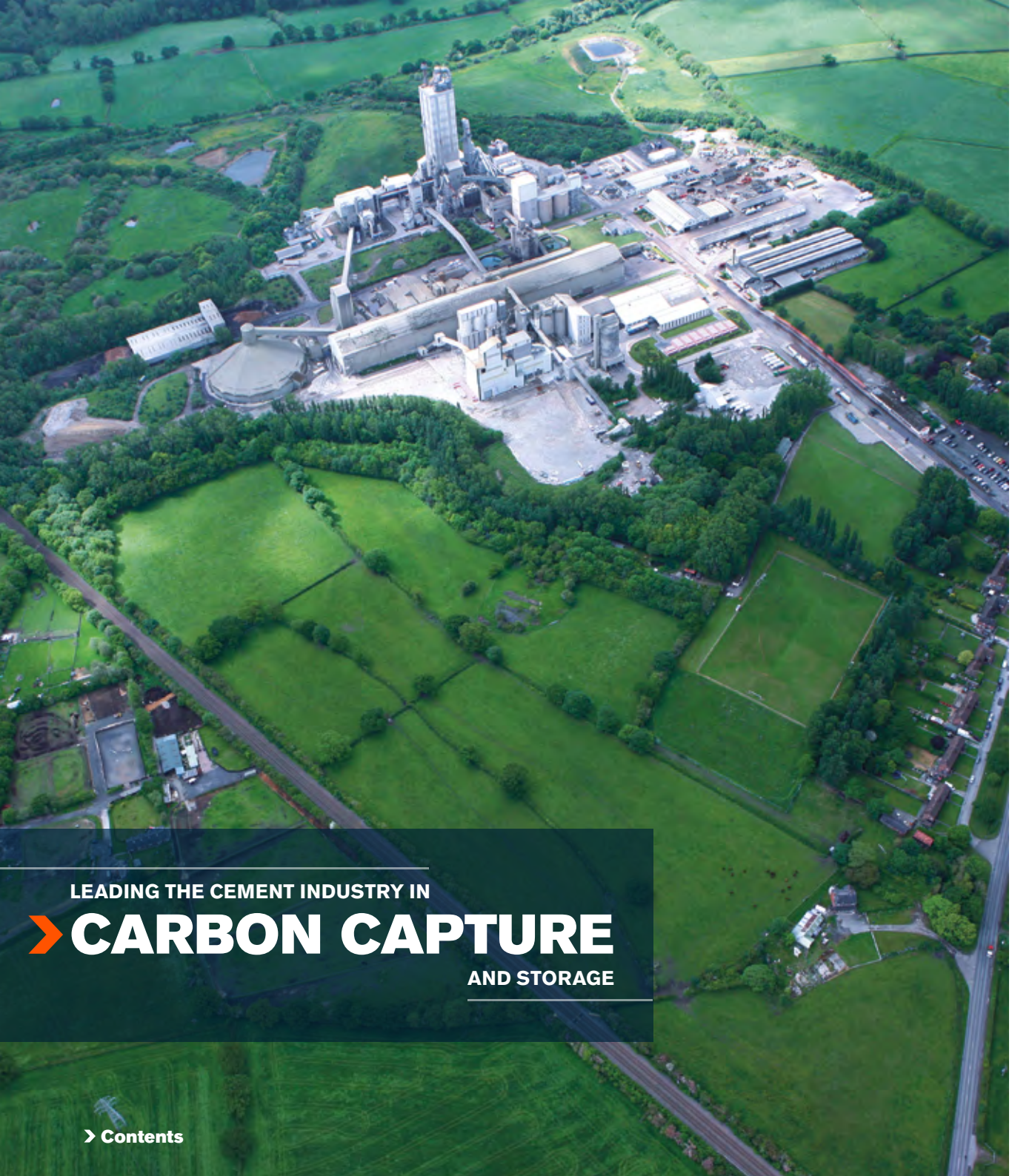
- The use of a net zero carbon fuel mix at Ribblesdale
- Mineralisation of our bypass dust using CO_2 captured from the stack at Ketton on a small scale.

Between 1990 and 2020, we have reduced the CO_2 emissions associated with cement production by more than 50%.

This has been achieved through a number of measures including:

- Investing to improve plant and process efficiencies.
- Switching to a zero-carbon electricity tariff.
- Installing a 13-megawatt solar farm at our Ketton cement works.
- Increasing the use of alternative lower/zero carbon fuels such as hydrogen and biomass, or fuels from waste such as liquid, paper and plastics which may have otherwise gone to landfill.
- Increasing use of lower carbon alternative materials such as Regen GGBS (ground granulated blastfurnace slag).
- Substitution of the CO_2 intensive clinker in cement by secondary cementitious materials (CEM II).

Contents



LEADING THE CEMENT INDUSTRY IN

CARBON CAPTURE AND STORAGE

Contents

Cement case study:

Carbon capture and storage (CCS)

A UK first at a cement plant

We are partners in the HyNet North West consortium, which aims to create the world's first low carbon industrial cluster through its development of a hydrogen and CCS project.

The project has been selected by the Government as one of two clusters to capture and store CO_2 by 2025. This gives us the confidence to invest in a carbon capture plant at our Padeswood cement works near Mold, north Wales, which will connect to the planned HyNet CO_2 transport and storage system. We are already carrying out a CCS feasibility study at the site, which will provide a clear design basis and cost estimate for the next stage.

The project will reduce regional CO_2 emissions by up to 10 million tonnes every year by 2030. This figure includes up to 800,000 tonnes from our Padeswood plant and, if successful, could mean that we will be able to produce net zero carbon cement from the plant as early as 2027, which would represent a huge leap forward in our decarbonisation plans.

WORLD'S FIRST

NET ZERO FUEL MIX

INCLUDING HYDROGEN IN A KILN

> Contents

Cement case study:

Fuel switching to hydrogen

The cement kiln at our Ribblesdale cement works in Lancashire has been successfully operated using a mix of net zero fuels as part of a world first demonstration project using hydrogen technology.

Funded by BEIS through the Mineral Products Association, the success of the trial provides a further potential pathway contributing to net zero cement production and has the capability to be replicated across the industry and beyond, both in the UK and globally.

A green hydrogen demonstration unit has also been developed and installed at our Regen GGBS plant in Port Talbot, and cited as an example of industrial decarbonisation in the Government's net zero strategy.

Through collaboration with researchers at the Energy Safety Research Institute at Swansea University, the aim of the demonstration unit is to replace some of the natural gas used to power the plant with green hydrogen, which is considered a clean source of energy.

REGEN GGBS PRODUCES

90% LESS CO_2 EMISSIONS

THAN CEM I PORTLAND CEMENT

Cement case study:

Regen GGBS

Regen GGBS (ground granulated blastfurnace slag) is used as a replacement for some of the cement content in concrete, grout and mortar, to reduce CO_2 emissions, increase the long-term durability of structures and conserve natural resources for future generations.

GGBS is a by-product of the iron making industry and its manufacture requires less than one third of the energy and produces less than 10% of the CO_2 emissions of CEM I Portland cement (PC). GGBS does not require the quarrying of new materials and the slag used will not be disposed of as landfill.

More than a third of all ready-mixed concrete deliveries in the UK contain GGBS, which can replace a substantial part of the normal PC content – generally about 50%, but sometimes up to 95% in special applications – and can be used anywhere concrete is needed.

CONCRETE

Concrete is an essential material that is needed for society and economic growth.

It absorbs CO_2 throughout its life and is 100% recyclable, contributing significantly to the circular economy and providing materials with lower embodied carbon.

We are the largest supplier of low carbon concrete in the UK and are committed to producing net zero carbon concrete by 2050. Our low carbon concrete contains Regen GGBS, which reduces the embodied CO_2 in a concrete mix by around 780kg for every tonne of CEM I it replaces.

The benefits of concrete

AVAILABILITY

Easily and readily from our network of plants nationwide.

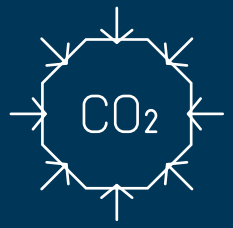
CIRCULAR ECONOMY

Concrete is long-lasting and 100% recyclable as well as being able to contain recycled/ secondary aggregates and low carbon cement replacement products.

THERMAL MASS

Due to its ability to absorb and store heat, concrete can reduce energy requirements through passive heating/cooling.

CARBON UPTAKE



Concrete absorbs CO_2 throughout its life. The more surface area exposed; the more it can absorb.

STRONG AND DURABLE

Concrete is strong, durable and resilient, withstanding flood, fire and natural disaster improving safety and reducing the need for maintenance and reconstruction.

VERSATILITY

Concrete can be used throughout a structure and is suitable for a wide range of applications, allowing designers, engineers and contractors to deliver efficient and effective projects.

Concrete is an essential material

Powerline transmission:
Scotland and northern England

Powercrete heat conducting concrete reduces transmission loss in underground power cables, maximising power capacity.

Hospital:
Christie Hospital, Manchester

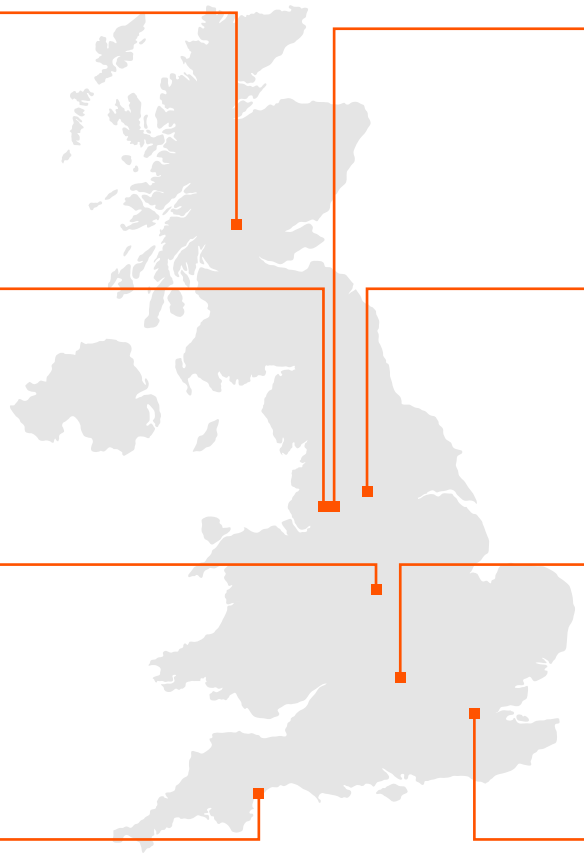
Supply of concrete containing 70% Regen GGBS to prevent thermal cracking and radiation shielding at cancer treatment facility.

Commercial: Mercia Park, north west Leicestershire

Mobile concrete plant set up to supply 90,000m³+ of low carbon concrete to construct new employment park.

Sea wall defences:
Marine Parade, Dawlish

Use of low carbon concrete to reinforce the new sea wall as part of Network Rail's coastal protection scheme reduced the carbon impact of the concrete by two-thirds.



Residential:
Deansgate Square, Manchester

110,000m³ of high specification watertight concrete containing 70% Regen GGBS, minimises production of heat and reduces risk of thermal cracking.

Energy from Waste power station:
Ferrybridge Multifuel

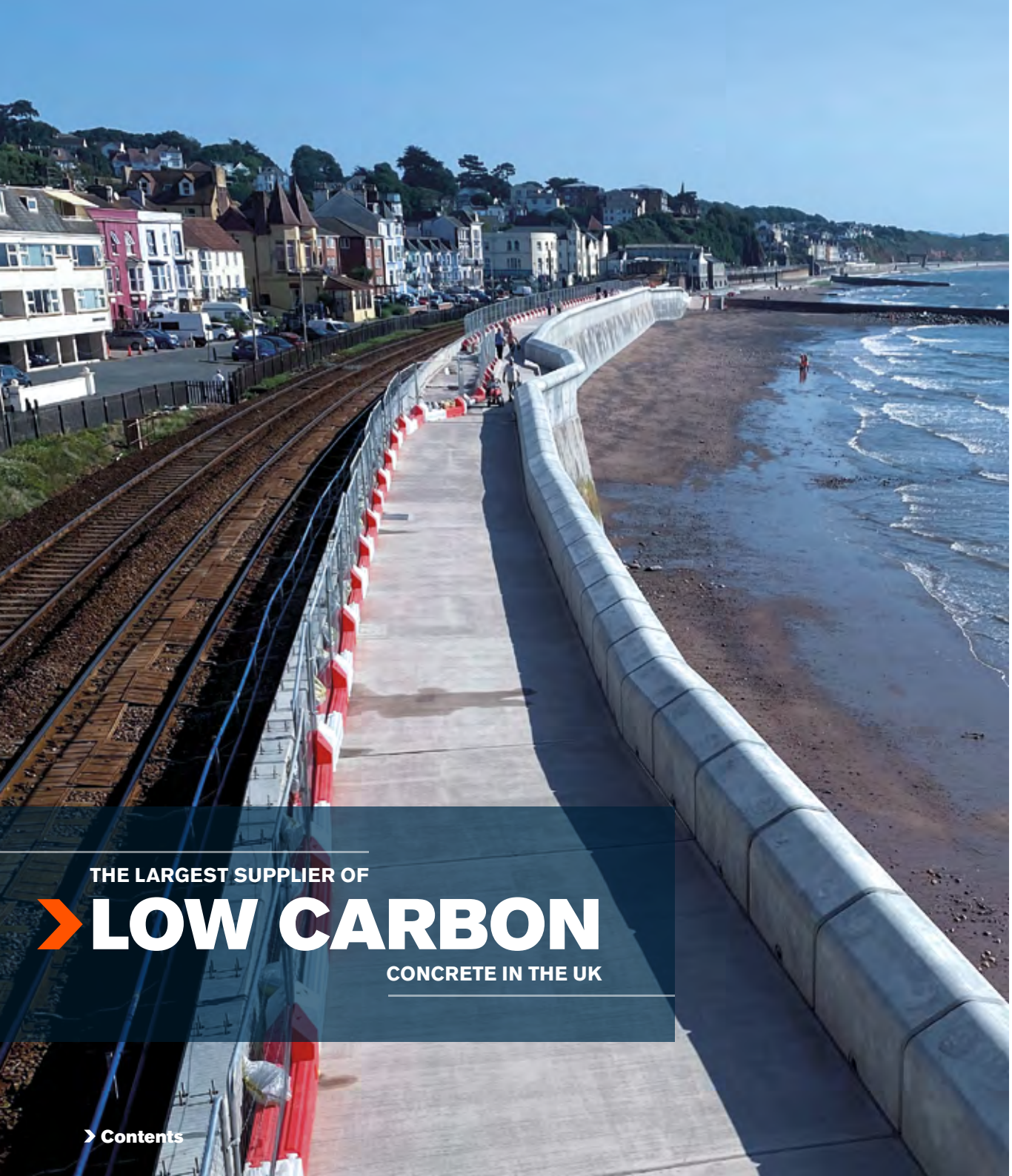
Concrete supplied for 11-day continuous slipform pour plus a range of mixes for other applications at the EfW site, which will create low carbon energy.

Buildings: Vaccine Manufacture & Innovation Centre

Help in fast-tracking the construction of the vital new building by providing concrete for the groundworks package at short-notice and under Covid-19 restrictions.

Tunnels: Crossrail and Thames Tideway

Supply of ready-mixed concrete, sprayed concrete and grouting, as well as pre-cast tunnel segments, for key national infrastructure projects.



THE LARGEST SUPPLIER OF

LOW CARBON

CONCRETE IN THE UK

Concrete case study:

Low carbon concrete

Our low carbon concrete is being used at Marine Parade in Dawlish, south Devon, to reinforce the new, bigger sea wall structure as part of Network Rail's coastal protection scheme. It is part of work being carried out to improve the resilience of the railway, which is the only line into the south west.

Using our low carbon concrete has helped contractor BAM Nuttall reduce the carbon impact of the concrete by two-thirds, which in turn has helped client Network Rail meet its ambition of limiting the carbon footprint of the project and reduce the chances of it contributing to further climate change.

AGGREGATES

Aggregates – crushed rock, sand and gravel – are all essential materials used to produce concrete, build roads, buildings and other infrastructure projects.

On land we operate 47 quarries across the country and have a network of rail-connected depots to optimise logistics and minimise vehicle movements and associated CO_2 emissions between depots and the end user. Over 20% of material is transported by rail.

We also have a fleet of five marine aggregate dredgers to allow us to produce marine-dredged sand and gravel, which is becoming increasingly important due to the scarcity of land-won reserves.

As well as three newly opened rail depots, we have invested in a new, efficient dredger, and are aiming to set up a recycled aggregates depot.

OUR NETWORK OF RAIL-CONNECTED DEPOTS SAVE

18.8 MILLION ROAD MILES

EACH YEAR, REDUCING CO_2 EMISSIONS

Contents

RAIL DEPOTS OPENED IN 2021 HAVE

SAVED 27,000

HGV MOVEMENTS

Aggregates case study:

New rail depots

In 2021 we have opened two new aggregates rail depots; in Tuebrook, near Liverpool, and West Drayton, west London.

The move is part of our strategy to improve our network of rail-connected depots and will reduce vehicle movements and associated CO_2 emissions. Annually, the two depots are expected to handle up to 600,000 tonnes of aggregate a year between them, keeping over 27,000 lorries off the roads.

Aggregates case study:

Hanson Thames dredger

We have launched Hanson Thames, our new dredger, which forms part of our strategy to replace our ageing dredgers.

The vessel, which will operate in the North Sea and English Channel, provides increased payload and efficiency, allowing it to carry up to 7,000 tonnes of marine aggregates per trip.

ASPHALT
AND CONTRACTING

Asphalt, which is used for roads, driveways, footpaths and runways is durable and 100% recyclable.

We are one of the UK's largest suppliers and are working with National Highways to help meet its ambition for net zero road construction and maintenance by 2040.

One of the ways we can help achieve this is by investing in our asphalt plants: by replacing the burners and converting from diesel oil to gas, we have increased drying efficiency by 15%.

› Contents

We can also help achieve net zero road construction and maintenance by 2040 by using our era® warm mix asphalts.

These can help cut the CO_2 emissions associated with asphalt production by 15% or more as they are produced and laid at lower temperatures, using less energy and delivering significant carbon savings. They can also contain up to 50% recycled asphalt planings (RAP).

era® 100 uses a micro-foaming process to reduce the temperature of the asphalt to below 100°C, cutting the carbon emissions associated with asphalt production by up to 50% while enhancing durability and improving health and safety for contractors.

era® 140 WMAs incorporate a specialist bitumen that allows asphalt to be produced at temperatures up to 40°C lower than conventional hot mix asphalt., reducing energy use and saving an average of 2.4kg of CO_2 per tonne of asphalt.

> Contents

Asphalt and contracting case study:

Tesco car parks

Our ERA warm mix asphalt was specified by Tesco to resurface four of its customer car parks across the country, realising a saving of 7,630kg of CO_2 emissions, compared with conventional hot rolled asphalt.

› Contents

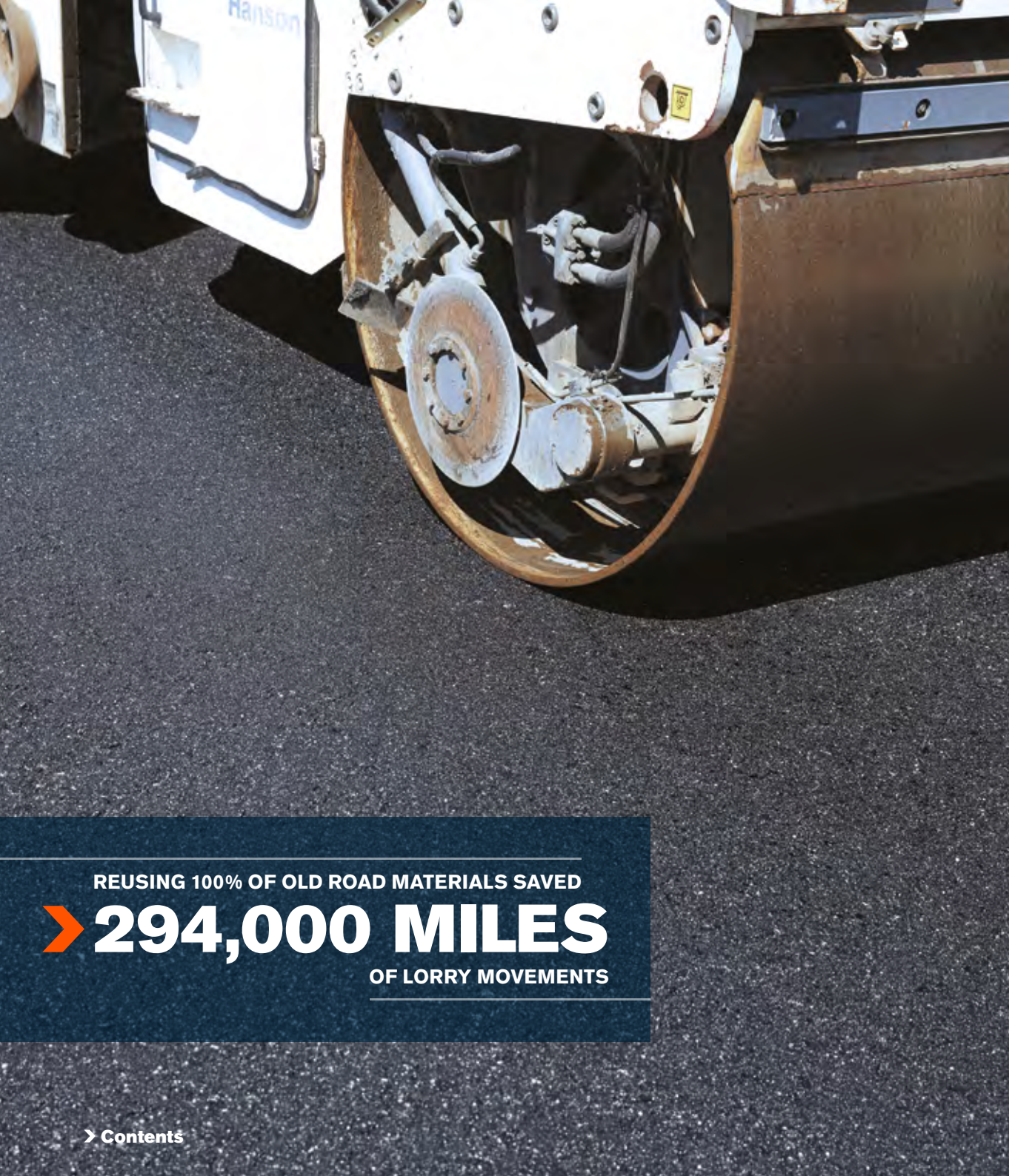
Asphalt and contracting case study:

Cumbria County Council

We are trialling asphalt containing additives derived from waste plastics in a project with Cumbria County Council aimed at reducing the carbon footprint of highways schemes and providing a more resilient road network.

Part of the ADEPT (Association of Directors of Environment, Economy, Planning & Transport) SMART Places Live Labs project, the trial is using Shell Bitumen's LTR (low temperature recycled), which uses a chemically modified waste plastic to make it compatible with bitumen and enable asphalt to be produced and laid at lower temperatures.

As well as developing a beneficial use for plastic at the end of its life the product also helps lower carbon emissions through reduced energy use during asphalt production.



REUSING 100% OF OLD ROAD MATERIALS SAVED

294,000 MILES

OF LORRY MOVEMENTS

Asphalt and contracting case study:

A338 Bournemouth Spur Road

The £22 million project to upgrade a 5.2 mile stretch of the A338 Bournemouth spur road, Dorset's busiest road, reused 100% of the old road materials into the base of the new road, processing it on site.

This prevented about 70,000 tonnes of asphalt being sent to landfill and saved 582 tonnes of CO_2 emissions.

COLLABORATION

We can help our customers and their clients meet their own carbon reduction targets through early engagement.

We provide advice and technical support to design, develop and supply bespoke materials suitable for a project's individual requirements and offer CPD-accredited webinars to educate all stakeholders on how to specify low carbon materials.

In addition, we use the BRE LINA online tool to provide life cycle assessments and verified Environmental Product Declarations (EPDs) to allow customers to choose the lowest carbon products for their projects. Verified EPDs are available for eight of our most popular concrete mixes as well as the UK average concrete, cement and Regen GGBS.

All aggregate, clinker, cement and Regen sources are available as materials within LINA to allow the generation of unverified EPDs for specific products on request, including the calculation of cradle to gate carbon that can be calculated for all products.

Get in touch

Visit **hanson.co.uk** for more information and to find out how we can help you with your own carbon reduction aims.

Hanson
HEIDELBERGCEMENT Group

COMMITTED TO REACHING

NET ZERO CARBON

BY 2050

Hanson UK
14 Castle Hill, Maidenhead,
Berkshire, SL6 4JJ

T: 01628 774 100

E: enquiries@hanson.com

hanson.co.uk

PPN 06/21 carbon reduction plan

Introduction

Hanson UK is committed to fulfilling our share of the global responsibility to keep the rise in worldwide temperature well below 1.5°C.

Our route to decarbonisation has been ongoing for many years and we have made significant headway. We have already reduced our CO_2 emissions in the UK by 50% since 1990 and are investing £55 million by 2025 to help cut this by a further 15%.

We aim to reach net zero carbon by 2050 and are involved in a number of industry-leading carbon reduction projects. These include carbon capture and storage at our Padeswood cement works planned to be in operation by 2027 – and a successful world first net zero carbon fuel mix trial at our Ribblesdale works in 2021.

Effective management of our CO_2 emissions is of key importance to us. Our long-term success depends on sustainable business practices and the UK executive team has given its full backing by launching a dedicated carbon working group to ensure that continuous CO_2 emission reductions are achieved.

Yours sincerely,

Simon Willis

Simon Willis
CEO Hanson UK

Padeswood cement plant in Mold, Flintshire

Ribblesdale cement plant in Clitheroe, Lancashire

Carbon reduction plan

Supplier name: Hanson UK

Publication date: 28/02/2022

Hanson UK

Hanson UK is a leading supplier of heavy building materials to the construction industry. We produce and sell four main product types – cement, aggregates, asphalt and ready-mix concrete (RMX). We are part of the HeidelbergCement Group, one of the largest building materials manufacturers in the world – it is the global market leader in aggregates and also has leading positions in cement, concrete and other downstream activities.

Our basic raw materials are used to make added value products:

- Crushed rock and sand are mixed with bitumen to make asphalt for road surfacing.
- Sand, gravel and limestone are mixed with cement to make ready-mixed concrete.
- Aggregates and cement are put into handy sized bags for selling through builders' merchants and DIY stores.

We operate over 300 production sites across England, Wales and Scotland including three cement plants, three granulated blast furnace slag (GGBS) plants, 70 aggregate quarries, wharves, depots, 35 asphalt plants and 180 ready-mixed concrete plants.

The vast majority of Hanson UK's CO_2 emissions are produced by our three cement plants. The production process is highly CO_2 intensive for two reasons: firstly, a chemical process takes place that produces CO_2, and secondly, large amounts of fuel are required to heat the raw materials in the kiln.

In comparison, the production of aggregates, asphalt and concrete have a much lower scope 1 CO_2 emission intensity per tonne: 3.5 kg for aggregates, 25 kg for asphalt and 1.0 kg for concrete.

Commitment to achieving net zero

Hanson UK makes essential materials to build our future and reaching net zero carbon by 2050 is a responsibility we take very seriously. We are committed to fulfilling our role in meeting the UK government's ambitions and our parent company, the HeidelbergCement Group, has signed the Science Based Target Initiative's (SBTi) Business Ambition for 1.5°C and joined the UN's Race to Zero campaign.

Due to the type of our manufacturing operations, the only greenhouse gas that is relevant is CO_2 and our net zero commitments relate to CO_2 only.

We have a roadmap in place that will help us achieve net zero by 2050. It includes improvements in plant efficiency and processes across our operations and the increased use of alternative raw materials and alternative fuels. We are also involved in several industry-leading carbon reduction projects, including carbon capture and storage (CCS) at our Padeswood cement works in north Wales as part of the HyNet North West project and demonstrating a net zero fuel mix using hydrogen at out Ribblesdale works in Lancashire.

Hanson UK has recently launched a dedicated cross-functional working group tasked with ensuring that we meet our targets. It is chaired by one of our board members.

HeidelbergCement also has a strong track record in reducing CO_2 emissions and was awarded a place on CDP's Climate Change A-list in 2019, 2020 and 2021. In 2020, it adopted a 'beyond 2020' strategy, with sustainability as one of six core areas, and it has committed to further reduce net CO_2 emissions and will realise its vision of carbon neutral concrete by 2050. In the UK, we have launched our 2030 commitments, which are the cornerstones of our sustainability strategy, and we are working to fulfil our share of the HeidelbergCement Group target.

In addition, we also hold a number of ISO accreditations, such as ISO 14001 (environmental management) and ISO 50001 (energy management, and these further demonstrate the environmental management measures we are taking.

Baseline emissions footprint

Baseline emissions are a record of the greenhouse gases produced in the past, before the introduction of any strategies to reduce them. They are the reference point to measure current and future reductions against.

Baseline year: 2016

Additional details relating to the baseline emissions calculations
Hanson UK is a manufacturing business and therefore our scope 1 and 2 emissions are significantly larger than our scope 3 emissions. Scope 1 and 2 emissions have been monitored, recorded and internally verified since 2010 (and also externally verified by Lucideon since 2013). Our 2021 emissions will be verified in May 2022. Hanson UK has started to record and monitor scope 3 emissions to its own internal standards and reporting procedures. However, the published scope 3 emissions are partly estimated. Hanson UK has launched a project to improve their accuracy in 2022.

Hanson's cement plants and several of our asphalt plants are subject to the EUETS regulations (now the UKETS regulations, as the scheme is known following Brexit) and their formal verified declarations are made to the Environment Agency and Natural Resources Wales on an annual basis.

The baseline year has been set to 2016 as this year is used as a basis for our carbon reduction target in line with SBTi's, the HeidelbergCement Group CO_2 reduction strategy and Hanson UK's 2030 commitments.

Baseline year emissions	
Emissions	**Total tonnes CO_2 (tCO_2e)**
Scope 1	1,986,423
Scope 2	203,049
Scope 3	456,877 (estimate)
Total emissions	**2,646,349**

Current emissions reporting

Reporting year: 2020

Baseline year emissions	
Emissions	**Total tonnes CO_2 (tCO_2e)**
Scope 1	1,768,549
Scope 2	4,791
Scope 3	406,766 (estimate)
Total emissions	**2,180,106**

Current scope 3 emissions are primarily derived from our transport operations (categories four and nine in the guidance supporting Procurement Policy Note (PPN) 06/21). From 2022, however, scope 3 emissions will also include categories five, six and seven but these are considered to be de-minimus (rough estimate: ~7,450t CO_2 emission) compared to other emissions. This may be further extended in future years to incorporate other scope 3 emissions, depending on their significance or applicability.

Emissions reduction targets

Hanson UK reports and monitors absolute and specific CO_2 emissions. However, our CO_2 reduction targets are set on a specific per tonne basis. Setting an absolute target in the short and medium term would be misleading as CO_2 emissions are mainly driven by sales volume. Higher sales increase absolute CO_2 emissions while lower sales decrease absolute CO_2 emissions.

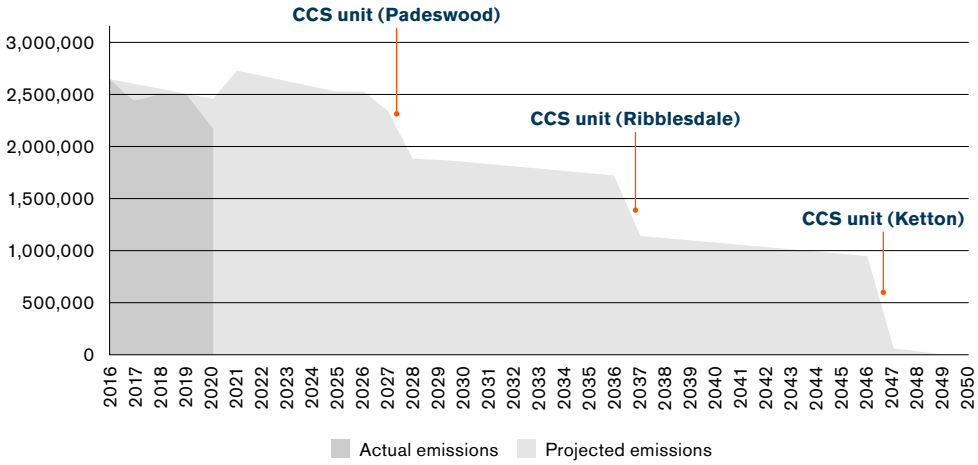
A carbon reduction target set on a specific per tonne basis is more meaningful as it better reflects the progress we are making. However, Hanson UK has set itself the target of reaching net zero carbon by 2050 in terms of absolute and specific CO_2 emissions.

To continue our progress towards achieving net zero, we have adopted the following targets, which are also part of our 2030 commitments:

- **Scope 1 emissions:** 15% reduction by 2030 (baseline: 2016)
- **Scope 2 emissions:** 65% reduction by 2030 (baseline: 2016)
- **Scope 3 emissions (from delivering to our customers):** 15% reduction by 2030 (baseline: 2019)
- **Car and van fleet:** 100% fully electric or hybrid (cars) and 50% full electric or hybrid (vans) by 2025

The targets apply to all of our operations – cement/GGBS, aggregates, asphalt and concrete.

We currently project absolute carbon emissions will decrease by 3.8% – an estimated 101,807 tonnes – by 2025 from a 2016 baseline.



The graph shows our target and actual emissions until 2050, with projected emissions expected to rise as cement sales are forecasted to grow. We anticipate CO_2 emissions will drop in 2027 thanks to our investment of more than £400 million in a CCS unit at the Padeswood cement plant. Further significant reductions are expected when our two remaining cement plants will install CCS units. We anticipated that this will be around 2037 and 2047.

Carbon reduction projects

Hanson UK has implemented a number of CO_2 emission reduction projects, which have enabled us to reduce our CO_2 emissions since 2016.

Completed projects

Electricity

Hanson UK has reduced its scope 2 emissions by 97.6% through only using carbon neutral electricity. We signed the relevant agreement with our electricity provider in 2018. We have been unable to fully reduce CO_2 emissions from our electricity consumption as some of our sites are obliged to purchase electricity from our landlords.

Use of GGBS

Hanson UK is the GGBS market leader in the UK. We operate plants at Port Talbot in South Wales, Purfleet in London and Teesside, in the north east and have terminals in the south west at Teignmouth and in Glasgow, Scotland.

Using GGBS as a cement alternative in concrete drastically reduces CO_2 emissions. GGBS has a significantly lower CO_2 footprint than cement because no process emissions occur and no fossil fuels are required to heat up the raw materials, which makes its use one of the most effective methods to reduce the CO_2 emissions in concrete.

Alternative fuels

The use of alternative fuels such as solvents, tyres and biomass reduces CO_2 emissions as they are burned instead of fossil fuels, such as coal. Hanson UK has increased the use at our cement plants from 32.4% in 2016 to 39.2% in 2020, with the share of biomass fuels rising by 4.6% to 17.3%. These increases were mainly achieved by a 30% growth in the use of solid recovered fuels which have a biomass content of ~45%.

Hanson UK is committed to reduce CO_2 emissions further and to reach net zero carbon by 2050. We have developed a net zero carbon roadmap to achieve this and we are working on a number of projects, as outlined below.

Blackpool sea defences, Lancashire – contains Regen GGBS

On-going/future projects

Carbon capture and storage (CCS)

This involves capturing CO_2 emissions before they are released into the atmosphere and then transferring them to a storage facility, such as an exploited oil or gas field.

The technology is a key part of our roadmap to achieve net zero carbon by 2050 as it allows us to decarbonise the cement production process.

Hanson UK is a partner in the HyNet North West consortium, which aims to create the world's first low-carbon industrial cluster by using hydrogen and CCS. HyNet will reduce regional CO_2 emissions by up to 10 million tonnes (including up to 800,000 tonnes from Hanson's Padeswood plant) every year by 2030. It is anticipated the project will reduce our total CO_2 emissions by about 30%.

As a first step, we will carry out a feasibility study to give us a clear design basis and cost estimate for a capture plant and connection to the planned HyNet North West CO_2 network and storage system. We are hoping the unit will be fully operational by 2027.

Net zero fuel trial

In a successful world first trial in 2021, we demonstrated the use of a net zero fuel mix at our Ribblesdale cement plant using hydrogen technology. The climate-neutral mix consisted of approximately 39% hydrogen, 12% meat and bone meal (MBM) and 49% glycerine.

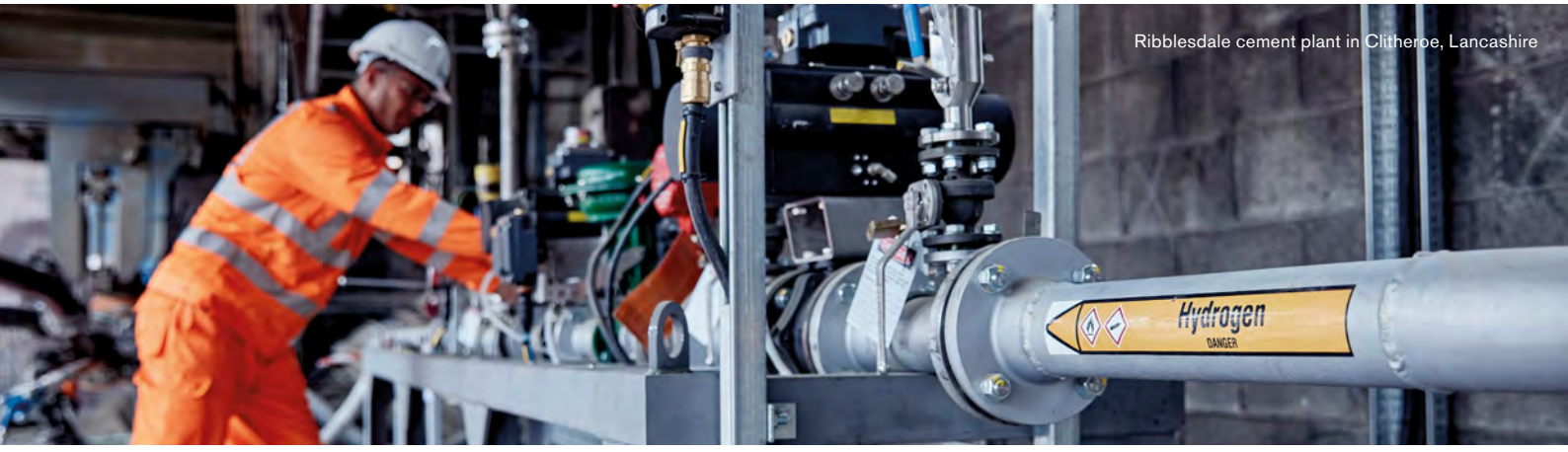
The project was supported by the Mineral Products Association and funded by the UK government's Department for Business, Energy and Industrial Strategy (BEIS).

During the demonstration, the proportion of fuels in the kiln's main burner were gradually increased to the net zero mix. If fully implemented for the whole kiln system, nearly 180,000 tonnes of CO_2 emissions could be avoided each year at Ribblesdale alone compared to using fossil fuels, such as coal.

Hydrogen use

Hanson UK is investigating innovative technologies to reduce industrial carbon emissions. A hydrogen demonstration unit, which generates green hydrogen through renewable energy, has been developed and installed at our GGBS plant in Port Talbot.

It aims to partially replace the natural gas used to power the plant with green hydrogen, which is a clean source of energy as it only emits water when burned. The unit produces hydrogen using renewable energy generated on-site through wind and solar. The energy is directed into an electrolyser – a water splitting device – where it separates water into hydrogen and oxygen. The hydrogen is then passed into the burner to enrich the combustion instead of natural gas.



Ribblesdale cement plant in Clitheroe, Lancashire

CEM II/A-LL

Reducing the clinker content in cement is a very effective method to reduce CO_2 emissions in cement. Currently the use of a CEM II/A-LL on its own or in combination with GGBS has only been permitted in certain applications. Therefore, a CEM I has predominately been used in the UK. However, a change in the concrete standards (BS 8500), which is expected to be implemented in 2022, will enable the wider use of a CEM II/A-LL cement. We are adjusting our product offering and will adding a CEM II/A-LL with a 10% limestone to reduce CO_2 emissions.

Initial trials have shown CEM II/A-LL cement has the same strength class (52.5 N) as regular CEM I and we are currently rolling it out to selected customers for further testing.

A large-scale rollout is planned once the concrete standard has changed. The new CEM II/A-LL is a critical milestone for Hanson UK and our customers to reduce CO_2 emissions. Overall, we anticipate that we can achieve a CO_2 emissions reduction of 20,000 tonnes per year.

Asphalt

Current initiatives include work on:

- **Fuel source:** The burner is the largest CO_2 emission source in production and we are aiming to change its fuel from gas oil to natural gas to reduce CO_2 emissions by ~25%. Further reductions can be achieved by using alternative fuels, including biofuels that are CO_2 neutral.
- **Asphalt mix temperature:** Hot mix asphalt, produced at temperatures in excess of 160°C, is currently the default type specified in the UK. Hanson UK is actively promoting warm mix asphalts, such as our ERA range, which are produced at a lower temperature (110-150°C) and have a lower CO_2 emission intensity of around 15%.
- **Alternative fuels:** Hanson UK is exploring the use of gas-to-liquids (GTL) fuels as an alternative to diesel. They are derived from natural gas, which has a lower CO_2 intensity. They also offer improved air quality and are non-toxic, odourless, readily biodegradable and have a low hazard rating.
- **Foam mix asphalt:** This is currently a niche product but Hanson UK is exploring its wider application as we believe it has the potential to reduce carbon emissions by more than 50%. Foam mix asphalt consists of a high proportion of recycled asphalt and uses foamed bitumen, resulting in cold asphalt paving.

Aggregates

In December 2021, Hanson UK has been successful in gaining funding from the Industry of Future Competition run by the UK government. The program aims to support industrial sites to decarbonise at a faster rate.

Hanson UK applied on behalf of our Cliffe Hill quarry, one of our largest. The allocated funds will support us in developing a decarbonisation roadmap for the quarry and for the asphalt plant on site. It will also allow us to evaluate various carbon reduction options and test their effectiveness in a live environment.

We are hopeful the investment will not only reduce CO_2 emissions on site but also allow us to transfer the knowledge gained to comparable sites to achieve further reductions.

Declaration and sign-off

This carbon reduction plan has been completed in accordance with PPN 06/21 and associated guidance and the reporting standard for carbon reduction plans. It will be reviewed and updated annually.

Emissions have been reported and recorded in accordance with the published reporting standard for carbon reduction plans and the GHG Reporting Protocol corporate standard seven, and uses the appropriate government emission conversion factors for greenhouse gas company reporting eight.

Scope 1 and scope 2 emissions have been reported in accordance with SECR requirements, and the required subset of scope 3 emissions have been reported in accordance with the published reporting standard for carbon reduction plans and the corporate value chain (scope 3) standard nine.

Our carbon reduction plan has been reviewed and signed off by the board of directors (or equivalent management body).

Signed on behalf of the Supplier:

Simon Willis

Simon Willis
Chief Executive Officer
Hanson UK

Date: March 2022