

FINAL APPROPRIATE ASSESSMENT UNDER REGULATION 61 OF THE CONSERVATION OF HABITATS & SPECIES REGULATIONS 2010

1. Introduction

1.1. This is a record of the Final Appropriate Assessment under Regulation 61 of the Conservation of Habitats & Species Regulations 2010 for planning application P0663/14/OUT, a hybrid planning application at the Northern Quarter, Cinderford, Gloucestershire, comprising demolition of existing buildings and structures and mixed use development and associated infrastructure and works to include:

- i) Full details of new highway infrastructure and improvements including a new link road between the A4136 and Broadmoor Road, associated means of access, earthworks, footpaths, landscaping, service infrastructure and other associated works and improvements; and full details of a new education campus including a building of 7,750 square metres (gross external area)(Use Class D1), associated means of access, car parking, earthworks, footpaths, landscaping, service infrastructure and associated works and improvements and;
- ii) Outline application with all matters reserved apart from access (in part) for up to 195 dwellings (Use Class C3); an hotel (Use Class C1) of up to 3000 sq.m, up to 18,800 sq.m. for employment uses (Use Class B1, B2 and B8) and a class D1 non-residential institutional use and associated internal estate roads, earthworks, car parking, footpaths, landscaping, service infrastructure and other associated works and improvements.

1.2. The LPA is responsible for undertaking the 'appropriate assessment' for this project. It must precede any authorisation of the project and is a necessary pre-requisite to any consideration of the derogation in Article 6(4). The appropriate assessment is an objective, scientific assessment of the project's implications for the qualifying features likely to be significantly affected in order to inform an 'integrity test'.

1.3. The work undertaken at the screening stage (Preliminary Screening dated 22nd May 2014 and Re-screening dated 9th July 2014) forms a valuable start to the appropriate assessment. However the appropriate assessment allows for a more detailed study of the implications of the project for the European Site(s) potentially affected. An important role of the appropriate assessment is to provide a better understanding of potential effects and therefore, where necessary, assist in the identification of further mitigation measures, which might be imposed by the LPA in order to ascertain that there will not be an adverse effect on the integrity of a European Site(s). More detailed examination, at appropriate assessment stage, may allow the LPA to conclude that the project will not, in fact, adversely affect the integrity of the European Site(s).

2. How the document is set out.

2.1. There is currently no set format or process for a Habitat Regulations Assessment. The flow chart at Appendix 1 outlines four sequential key stages/elements associated with a Habitat Regulations Assessment and where Appropriate Assessment fits within this.

2.2. The Screening, Re-Screening and this Appropriate Assessment make up the Habitats Regulation Assessment and therefore all three documents need to be read in conjunction. The tables in the Assessment are divided into distinct sections (Boxes) which start from the point where significant effects were identified in the Screening/Re-Screening (Box A). Project mitigation measures, proposed by the project proposer, are set out in Box B, with an assessment of effectiveness of those measures in Box C by the LPA as the competent authority. Additional mitigation measures considered necessary by the LPA are identified in Box D and the outcome as a result of all measures (proposed and imposed) is identified in Box E. Box F addresses the integrity test and finally in Box G any assumptions or limitations made during the assessment are identified.

2.3. As a competent authority it is important that the Appropriate Assessment sets out where it agrees with the information and assessments undertaken by the project proposer and where it does not. These considerations are set out in Box C.

3. Summary of the conclusion of the assessment

3.1. The project has been considered in light of the assessment requirements of Regulation 61/102 of the Conservation of Habitats and Species Regulation 2010 by the LPA which is the competent authority responsible for permitting the project and any assessment of it required by the Regulations.

3.2. Having carried out the 'screening' (and re-screening) assessment of the project, the competent authority concluded that it would be likely to have a significant effect on the Severn Estuary SAC, SPA and Ramsar Site and the Wye Valley and Forest of Dean Bat Sites SAC (in light of the definition of these terms in the 'Waddenzee' ruling of the European Court of Justice Case C-127/02). Consequently, an appropriate assessment of the implications of the project on the qualifying features of those sites in light of their conservation objectives was required.

3.3. Following the appropriate assessment in accordance with the Regulations, the competent authority has ascertained that **the project would not adversely affect the integrity of any European Site alone, subject to the imposition of the mitigation measures set out in Table 1 and 2a-f**. The appropriate assessment has not identified any residual effects from the project that will remain and so has deemed it unnecessary to assess the effects of the project in combination with the effects of other plans and projects. It is noted that there are additional benefits as a result of the proposal such as night roosts, a hibernaculum and long term maintenance of new roosts. This assessment however has relied on measures to cancel each potential adverse affect, those measures 'in excess' of that required to cancel adverse affects are not relied upon in the consideration of adverse effects on the integrity of any European site. Successful implementation of measures to cancel adverse effects on the European site would overall increase roost capacity and availability; improve roost resilience by way of distribution of roosts; secure long-term management and maintenance of roosts and improve forage habitat capacity and availability to roosts.

4. Information used for assessment

4.1. A copy of the list used to scan for and select European Sites potentially affected by the project can be found at Appendix 2. In reaching the conclusion the key documents in Appendix 5 were also taken account of.

4.2. A summary of the information gathered for the assessment is presented in the Information Required for Assessment schedule which can be found at Appendix 3.

5. The screening of the project

A summary of the outcomes of the screening process is given in the screening (and re-screening) schedule which can be found at Appendix 4.

6. Mitigation measures

In reaching the conclusion of the screening assessment the competent authority took account of the information and mitigation given in Table 1 for the Severn Estuary SAC, SPA and Ramsar Site and Table 2a-g for the Wye Valley and Forest of Dean Bat Sites SAC.

7. Appropriate assessment

The competent authority undertook an objective scientific assessment of the implications of the project on the qualifying features of the Severn Estuary SAC, SPA and Ramsar Site and Wye Valley and Forest of Dean Bat Sites SAC using the best scientific knowledge in the field. The assessment is presented in Table 1 for the Severn Estuary SAC, SPA and Ramsar Site and Table 2a-g for the Wye Valley and Forest of Dean Bat Sites SAC.

8. Further mitigation measures

The competent authority considered the manner in which the project was to be implemented and any further mitigation measures that could be relied upon when deciding whether it could be ascertained that the project would not have an adverse effect on site integrity, including when and how they might be embedded into the project. Further information about this conclusion is presented in Table 1 for the Severn Estuary SAC, SPA and Ramsar Site and Table 2a-g for the Wye Valley and Forest of Dean Bat Sites SAC.

9. Integrity test

Table 1 - Severn Estuary SAC, SPA and Ramsar Site – water pollution from construction activities

<p>(Box A) Potential adverse effect identified by screening process</p>	<p>The project site has a hydraulic connection to the Severn Estuary SAC, SPA and Ramsar Site. The screening has identified that there is potential of this European Site to be adversely affected by indirect water pollution (silt or toxic pollution) originating from contaminated construction run off.</p>	
<p>(Box B) Information and incorporated mitigation measures to address affect from project proposer Construction Environmental Management Plan (CEMP) would be prepared for each phase of development in accordance with the Environment Agency’s Pollution Prevention Guidelines (PPGs) (ES Addendum 13.118c). Phase 1: Outline CEMP (Further information request response Appendix B.2 Aug 2014)</p>	<p>(Box C) Appropriate assessment outcome The closest part of the European Site is 9km from the application site. It is agreed that in principle the mitigation measures outlined could reduce adverse effects on the European Site and that any residual impacts could be cancelled by natural treatment. Only an outline CEMP has been embedded within the project by the project proposer for Phase 1 and no CEMP has been embedded for Phase 2. As such there are doubts about its effectiveness, reliability, timing and its delivery cannot be guaranteed. As such only moderate weight has been afforded or reliance placed on this mitigation measure within the assessment and therefore it is not sufficiently certain that mitigation measures currently proposed will cancel or avoid adverse effects on the integrity of the European Site.</p>	
<p>(Box D) Additional mitigation measures required to address uncertainty or residual effects identified in Box C</p>	<p>When and how will the measure be embedded in the project?</p>	
<p>i. Requirement to submit, and implement, a detailed CEMP in accordance with ES addendum and further information request response Appendix B.2 Aug 2014.</p>	<p>Pre-commencement condition for spine road and plots E and E2.</p>	
<p>ii Requirement to submit, and implement, a detailed CEMP in accordance with ES addendum.</p>	<p>Pre-commencement condition for plots A1-3, B, C, D, F1-2, G, H.</p>	
<p>(Box E) Outcome of additional mitigation measures Adverse effects (Box A) can be mitigated by measures set out in Box B & Di & ii and it is therefore ascertained that the imposition of the above measures will avoid/cancel any indirect water pollution impacts from construction on the Severn Estuary SAC, SPA and Ramsar Site. No residual impacts are expected.</p>		
<p>(Box F) Integrity test conclusion Subject to the imposition/incorporation of the above additional mitigation measure/s, it is ascertained that any adverse effects from water pollution from construction would be cancelled and that the project would not adversely affect the integrity of the Severn Estuary SAC, SPA and Ramsar Site.</p>		
<p>(Box G) Assumptions 1. Given the distance between the project site and the Severn Estuary it is reasonable to assume that any residual discharge of contaminated run off that may enter the Cinderford Brook would be treated naturally prior to discharge into the European Site via, dilution, settlement, entrapment, biological treatment and oxygenation (ES Addendum 13.118c).</p>		

Table 2a - Wye Valley and Forest of Dean Bat Sites SAC- indirect disturbance from construction and mitigation activity on lesser horseshoe bat roosts

<p>(Box A) Potential adverse effect identified by screening process</p>	<p>The project site does not contain any European Site. However, some of the buildings within and close to it support a maternity colony of lesser horseshoe bats whose population exceeds 355 individuals. These bats over-winter within with in the Wye Valley and Forest of Dean Bat Sites SAC. As such this lesser horseshoe bat colony is considered a qualifying feature of the European Site. The screening has identified that there is potential for the existing and replacement roosts within and near to the project site that support this qualifying feature to be adversely affected by indirect disturbance during construction of Phase 1 and indirect disturbance during construction and mitigation of Phase 2. More specifically there is potential for development some distance away to cause disturbance to roosts (primarily from noise and vibration) should there be a need for associated construction compounds or construction traffic routes for example to be located in proximity to one or more of the roosts.</p>
<p>(Box B) Information and incorporated mitigation measures to address affect from project proposer Construction Environmental Management Plan (CEMP) would be prepared for phase 1 construction including location/extent of construction compounds, construction traffic routes, and exceptional use criteria for these (ES Addendum 7.275). Phase 1: Outline CEMP (Further information request response Appendix B.2 Aug 2014).</p>	<p>(Box C) Appropriate assessment outcome It is agreed that, due to their distance from the project site and being surrounded by woodland, indirect disturbance from construction will be entirely avoided at the existing artificial roost within the Hawkwell Inclosure and at replacement roost RR2b (due for construction in 2014).</p> <p>It is also agreed that in principle the mitigation measures outlined (Box B) are capable of cancelling indirect construction disturbance to the Main Office, Bath House, Canteen and replacement roost RR1 during Phase 1. However, it is not agreed that indirect construction disturbance during Phase 2 would be avoided at the Main Office, Bath House, Canteen and replacement roost RR1 (due for construction in 2014) as these roosts lie within or in much closer proximity to the project site . It is also not agreed that the precautionary mitigation measures proposed would fully cancel such indirect construction disturbance during Phase 2.</p>
<p>CEMP would be prepared for Phase 2 including measures to ensure construction staff's awareness of the existing artificial and replacement roosts (ES Addendum 7.368b).</p>	<p>The project proposer has not embedded within the project any CEMP for Phase 2 and has only embedded an outline CEMP for Phase 1. Mitigation to fully cancel disturbance associated with broadleaved woodland restoration around the existing artificial roost has also not been embedded by the project proposer. As such there are doubts about the scope, the effectiveness, reliability and timing of the mitigation outlined and its delivery cannot be guaranteed.</p>
<p>Gradual replacement of conifer over 20 year period for MP-2(R)B MP-2(R)C with felling and restocking every other year over this period and felling restricted (ES Addendum Appendix 7.11)</p>	<p>It is agreed that the mitigation measures outlined for mitigation areas MP-2(R)B and MP-2(R)C will reduce disturbance to the existing artificial roost from broadleaf woodland restoration proposals. It is not agreed that this mitigation will fully cancel disturbance to the existing artificial roost. It is agreed that, due to its distance from the project site, disturbance from mitigation areas will be avoided at replacement roost RR2b.</p> <p>As such only moderate weight has been afforded or reliance placed on this mitigation and therefore it is not sufficiently certain that mitigation measures currently proposed will</p>

	cancel or avoid adverse effects on the integrity of the European Site.
Box D: Additional mitigation measures required to address uncertainty or residual effects identified in box C	When and how will the measure be embedded in the project?
i. Requirement to prevent construction of phase 2 of the spine road, plots A1-3 and B until demolition of the Main Office, Canteen and Bath House has been completed (see additional conditions in Table 2b relating to this).	Via condition.
ii. Requirement to submit, and implement, a detailed CEMP in accordance with ES addendum and further information request response Appendix B.2 Aug 2014.	Pre-commencement condition for spine road and plots E and E2.
iii. Requirement to submit, and implement, a detailed CEMP in accordance with ES addendum.	Pre-commencement condition for plots A1-3, B, C, D, F1-2, G, H.
iv. Broadleaved woodland restoration method of working including drawings of felling compartments and schedule, extraction routes and felling exclusion zone for MP-2(R)B and MP-2(R)C.	Via condition and S106 agreement.
(Box E) Outcome of additional mitigation measures	
Adverse effects (Box A) can be mitigated by measures set out in Box B & Di - iv and it is therefore ascertained that the imposition of the above measures in the form of planning conditions and/or obligations will avoid/cancel any indirect disturbance from construction and mitigation on lesser horseshoe bat roosts from the project. No residual impacts are expected.	
(Box F) Integrity test conclusion summary	
Subject to the imposition/incorporation of the additional mitigation measure/s set out above, it is ascertained that the project would not adversely affect the integrity of the Wye Valley and Forest of Dean Bat Sites SAC as a result of indirect disturbance from construction and mitigation activity on lesser horseshoe bat roosts.	
(Box G) Assumptions/limitations	
1. The ES addendum provides a phasing plan. However this Assessment also assesses and considers adverse impacts as a result of development taking place in a different and/or more detailed order. In the absence of a detailed phasing plan it is assumed that construction of the spine road and/or plots A1-A3 and B could commence whilst the Main Office, Bath House, Canteen buildings are still in situ and are still supporting significant numbers of bats. Imposition of conditions above addresses this assumption.	

Table 2b - Wye Valley and Forest of Dean Bat Sites SAC –demolition impacts (direct disturbance, killing or injury) on lesser horseshoe bat roosts

<p>(Box A) Potential adverse effect identified by screening process</p>	<p>The project site does not contain any European Site. However, some of the buildings within and close to it support a maternity colony of lesser horseshoe bats whose population exceeds 355 individuals. These bats over-winter within with in the Wye Valley and Forest of Dean Bat Sites SAC. As such this lesser horseshoe bat colony is considered a qualifying feature of the European Site. Whilst the existing artificially roost will be retained, the Main Office, supporting a peak count of 43 bats (12%) in 2013, and the Bath House, supporting a peak count of 19 bats (5%) in 2013, are proposed to be demolished as part of Phase 2 of the project. No other lesser horseshoe bat roosts are proposed to be demolished as part of the project. The screening has identified that there is potential for significant numbers of bats to be directly disturbed, injured or killed during demolition and for there to be a net loss of maternity roost sites.</p>
<p>(Box B) Information and incorporated mitigation measures to address affect from project proposer Demolition methodology including cessation of demolition until ‘significant use’ of replacement roosts has been established through monitoring; demolition constrained to autumn/winter period, exclusion and soft demolition/gradual deconstruction techniques, ecological supervision (7.369a).</p>	<p>(Box C) Appropriate assessment outcome It is agreed in principle that the mitigation measures outlined could cancel direct disturbance to, and killing and injury of bats. However, due to a lack of detail regarding the demolition methodology there are doubts about its effectiveness, reliability, timing and its delivery cannot be guaranteed. In particular, insufficient detail has been provided on timing of demolition, soft demolition and deconstruction techniques and the definition of ‘significant use’ for replacement roosts RR1 and RR2b. As such only moderate weight has been afforded or reliance placed on this mitigation and there it is not sufficiently certain that mitigation measures currently proposed will cancel or avoid adverse effects on the integrity of the European Site.</p>
<p>Replacement roost strategy methodology including provision of like-for-like replacement roosts (RR1 & RR2b) and provision of two additional night roosts (7.368b, 7.370), Figure 7.5 (Annex B.4 Further information relating to the Habitats Regulations Assessment (Annex A) and Environmental Impact Assessment, August 2014).</p>	<p>It is agreed in principle that the mitigation measures outlined could cancel net loss of maternity/night roosts from demolition. Replacement roosts RR1 and RR2b are implementable through previous planning permissions (P1495/12/FUL and P0153/13/FUL) and are currently under construction. The night roosts are implementable through permitted development. The long-term management and monitoring of roosts was previously secured through a S106 agreement for P1449/12/OUT and a similar arrangement is needed for this project. The existing artificial roost is managed by the Forest of Dean District Council and is to be retained on a 50 year lease. As such significant weight has been afforded or reliance placed on this mitigation and there is certainty that the mitigation measures outlined will cancel or avoid adverse effects on the integrity of the European Site.</p>
<p>Box D: Additional mitigation measures required to address uncertainty or residual effects identified in box C</p>	<p>When and how will the measure be embedded in the project?</p>
<p>i. Requirement that no actions associated with the demolition of the Main Office building or Canteen at Northern United (as shown in Fig. 6, page 17 of the Kestrel Wildlife Consulting Ltd Report, Appendix 7.4 of the ES Addendum) shall take place until a report has been submitted to and approved in writing by the Local Planning Authority recording that monthly roost counts demonstrate a minimum of 50 lesser horseshoe bats clustering in 1 of 2 replacement roosts (i.e. RR1 or RR2b) in each month between April and August in any one year. This condition is based on the advice from Natural England in relation to the previous planning application for the</p>	<p>Via pre-commencement condition for spine road phase 2, plots A1-3 only).</p>

demolition of the same roosts (P1449/12/OUT).	
ii. Requirement that no actions associated with the demolition of the Bath House building at Northern United (as shown in Fig. 6, page 17 of the Kestrel Wildlife Consulting Ltd Report, Appendix 7.4 of the ES Addendum) shall take place until a report has been submitted to and approved in writing by the Local Planning Authority that roost counts demonstrate a minimum of 15 lesser horseshoe bats present at any one time in the other (by reference to the condition above) of 2 replacement roosts (i.e. RR1 or RR2b) between April and September in any one year. This condition is based on the advice from Natural England in relation to the previous planning application for the demolition of the same roosts (P1449/12/OUT).	Via pre-commencement condition for spine road phase 2, plots A1-3 only).
iii. Requirement to construct RR1 and RR2b and secure their long-term management and monitoring and the existing artificial roost as per S016 for P1449/12/OUT and to establish the thresholds in i. above are met prior to any demolition of the existing roosts.	Via condition and S106 agreement.
iv. Requirement to submit a detailed demolition methodology for the Main Office, Canteen and Bath House in accordance with 7.369a of the ES Addendum, approval in writing by the LPA and implementation in accordance with this.	Via pre-commencement condition for the first development plot or section of spine road west of plot c.
v. Requirement to construct, maintain and monitor two lesser horseshoe night roosts, in accordance with para 7.370 of the ES Addendum.	Via S106 agreement.
<p>(Box E) Outcome of additional mitigation measures Adverse effects (Box A) can be mitigated by measures set out in Box B & Di - v and it is therefore ascertained that the imposition of the above measures in the form of planning conditions and/or obligations will avoid/cancel demolition impacts (direct disturbance, killing or injury) on lesser horseshoe bat roosts from the project. No residual impacts are expected.</p>	
<p>(Box F) Integrity test conclusion summary Subject to the imposition/incorporation of the additional mitigation measure/s set out above, it is ascertained that the project would not adversely affect the integrity of the Wye Valley and Forest of Dean Bat Sites SAC as a result of demolition impacts (direct disturbance, killing or injury) on lesser horseshoe bat roosts.</p>	
<p>Assumptions/limitations</p> <ol style="list-style-type: none"> Survey work undertaken in 2013 demonstrated that the Canteen is only used as an intermittent roost by solitary individual lesser horseshoe bats. However, bats have been recorded flying along and through the building and previous survey reports have suggested that it may function as a light sampling area for nearby roosts. Given this a precautionary approach to its importance is assumed and its status is considered integral to that of the Main Office roost. The absence of suitable night roosting opportunities is likely to be a significant limiting factor to lesser horseshoe bats. The two replacement roosts, RR1 and RR2b (due for construction in 2014) which are associated with the development are located within forage areas and along commuting routes identified as being used by the Northern Quarter lesser horseshoe bat colony from previous radio tracking studies. RR1 and RR2b have been designed specifically to provide significant maternity roost opportunities for lesser horseshoe bats. RR2b has also been designed to include hibernaculum provision as an enhancement. These designs are based on successful artificial roost designs from elsewhere. Their construction, long term monitoring and maintenance have been secured through previous planning permissions. On this basis, and given time, it is reasonable to assume that lesser horseshoe bats will find and successfully colonise both replacement roosts, increasing the population of the Northern Quarter lesser horseshoe population significantly above the peak count recorded in 2013. Replacement roosts will increase geographic spread, improving roost to forage habitat accessibility and increase resilience in relation to the potential for unplanned changes in local environment. 	

Table 2c - Wye Valley and Forest of Dean Bat Sites SAC – road collision and severance impacts associated with lesser horseshoe bat flyways

<p>(Box A) Potential adverse effect identified by screening process</p>	<p>The project site does not contain any European Site. However, some of the buildings within and close to it support a maternity colony of lesser horseshoe bats whose population exceeds 355 individuals. These bats over-winter within the Wye Valley and Forest of Dean Bat Sites SAC. As such this lesser horseshoe bat colony is considered a qualifying feature of the European Site. Bats disperse primarily from these buildings along several major flyways. Lesser horseshoe bats have been known to cross new roads where these intersect traditional flyways, but there is a risk that the use of such flyways will decline overtime unless the gaps in vegetation created by the road’s construction are addressed¹². When lesser horseshoe bats do cross roads they are likely to do so relatively close to the ground (due to gaps in vegetation cover and/or elevated lighting levels from street lighting³) putting them at high risk of collision with motor vehicles. The project includes proposals for a spine road that crosses several flyways (1A, 1B, 1C, 2 and 4)⁴ and as such the screening has identified that there is potential for bats to be injured or killed during the operation of this road or for the road to sever their flyways. NB. Road collision impacts associated with the A4136 were ‘screened out’ at Re-screening stage.</p>
<p>(Box B) Information and incorporated mitigation measures to address affect from project proposer</p> <p>Purpose built bat culverts for major flyway 1 & 2 (ES Addendum 7.478g-l, Drwg. nos 1700-1702 (rev2))</p> <p>Landscaping for bat culverts (7.478j. Drwg. Nos 3000/07 & 3000/07 (rev 1))</p> <p>Hop over landscaping for minor flyway 4 (ES Addendum 7.479, Drwg. No 3000/06 (rev1))</p> <p>Wide bridge crossings for the Cinderford and Old Engine Brooks Drwg. nos 1703-1704 (rev2))</p> <p>Spine Road lighting strategy (Northern Quarter Lighting Strategy (Rev A, April 2014, Drg. Nos 1301-1305 Rev 3))</p> <p>Spine Road landscaping strategy (Drwg. Nos 3000/06- 3000/10 (rev 1) and 3000/11(rev 1), 3000/12-3001/14)</p> <p>Monitoring of bat culverts/bridges (ES Addendum 7.518), monitoring to assess the effectiveness of spine road measures including bridges, hop</p>	<p>(Box C) Appropriate assessment outcome</p> <p>It is agreed in principle that the size of culverts proposed can be used by lesser horseshoe bats (based on published research of similar sized culverts elsewhere⁵). However, it is uncertain about the proportion of bats associated with major flyway 1 and 2 that will actual use such culverts due to: a lack of appropriate monitoring to demonstrate the effectiveness of such underpasses elsewhere⁶ and; the unavoidable misalignment of the proposed culverts with existing major flyways 1 and 2 due to local topography.</p> <p>It is agreed in principle that appropriate landscaping of the culverts would help prevent flyway 1 from splitting north of the western culvert and guide bats associated with flyways 1 and 2 to the western and eastern culverts respectively and so further reduce, but not necessarily cancel, collision risks for major flyways 1 and 2. In addition, due to an absence of any planting schedule for the landscaping of the culverts proposed there are doubts about its effectiveness, reliability, timing and its delivery cannot be guaranteed.</p> <p>It is uncertain how landscaping and other flyway retention measures for the spine road will be phased and integrated to ensure continuity of major flyways during construction and operation and transition between these.</p> <p>It is agreed in principle that the spine road landscaping and lighting</p>

¹ Billington, G., (2001). A487 Llanwnda to south of Llanllyfni. Improvement bat surveys. Interim report. Period May to November 2001. Unpublished report to Gwynedd Council.

² Billington, G., (2003). A487 Llanwnda to south of Llanllyfni. Improvement bat surveys. Interim report. Period April to October 2002. Unpublished report to Gwynedd Council.

³ Schofield, H.W., 1996. The ecology and conservation biology of *Rhinolophus hipposideros*, the lesser horseshoe bat. Ph.D. Thesis, University of Aberdeen.

⁴ As shown on Figure 7.4., Appendix B.4 of the Further Information relating to the Habitats Regulations Assessment (Annex A) and Environmental Impact Assessment (Annex B) dated August 2014.

⁵ Highways Agency, 2011. A review of Bat Mitigation in Relation to Highway Severance.

⁶ Berthinussen A, Altringham J (2012) Do Bat Gantries and Underpasses Help Bats Cross Roads Safely? PLoS ONE 7(6): e38775. doi:10.1371/journal.pone.0038775

<p>overs, unlit/un-vegetated sections of the road to mitigate road collision risks (Annex A Further Information Relating to the Habitats Regulations Assessment Aug 2014)</p>	<p>mitigation measures in combination with slower traffic speed associated with the junction of the A1436 will reduce, but not cancel, collision risk at minor flyway 4. In addition, due to the absence of any planting schedule for the landscaping proposed there are doubts about its effectiveness, reliability, timing and its delivery cannot be guaranteed.</p> <p>It is agreed that in the region of 83.5% to 98.5% of the lesser horseshoe bat movements associated with the Northern Quarter lesser horseshoe bat colony occur along major and minor flyways 1 to 5⁷. It is also agreed that remaining movements can be accounted for by individual bats that fly (and forage) almost entirely within the Hawkwell Inclosure and by other individuals which disperse more widely from the roosts (i.e. not along flyways 1 to 5). From this it is concluded that there is a risk that a very small number of bats may cross the spine road at points other than at the culverts and hop over. For these individual bats it is agreed in principle that collision risks along the spine road will be reduced, but not necessarily avoided, by: providing wide bridges over water courses that are likely to be used as occasional commuting routes; including open areas adjacent to the road to dissuade bats from crossing and; keeping extensive sections of the spine road unlit in order to encourage remaining bats intent on crossing over the spine road to do so at greater (and therefore safer) height.</p> <p>It is agreed in principle that, in combination with all the above measures, a suitable responsive early warning monitoring scheme to assess the effectiveness of proposed measures to reduce/avoid bats crossing the spine road at unsafe heights would cancel any residual collision impacts along the spine and other roads. However, due to a lack of specific objectives and success criteria and detailed methodologies and adaptive management measures in relation to the monitoring scheme there is some uncertainty as to the delivery of the monitoring scheme.</p> <p>Given the above assessment only moderate weight has been afforded or reliance placed on the mitigation measures proposed and there it is not sufficiently certainty that mitigation measures currently proposed will cancel or avoid adverse effects on the integrity of the European Site.</p>
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Box D: Additional mitigation measures required to address uncertainty or residual effects identified in box C	When and how will the measure be embedded in the project?
i. Requirement that the spine road be constructed in accordance with culvert and bridge details as specified in ES Addendum 7.478g-l and Drwg. nos 1700-1704 (rev2) and will not be lit unless otherwise agreed in writing with the LPA.	Via condition for spine road phase 1 and 2.
ii. Requirement that landscaping be undertaken in accordance with Drwg. Nos 3000/11(rev 1) and 3000/12-3001/14 and vegetation clearance and protection be undertaken in accordance with Drwg Nos. 3000/04 and 3000/05 (rev 1), unless otherwise agreed in writing with the LPA.	Condition for spine road phase 1.
iii. Requirement that landscaping be undertaken in accordance with Drwg. Nos 3000/06 (rev 1) to 3000/10 (rev 1) and vegetation clearance and protection be undertaken in accordance with Drwg Nos. 3000/01 to 3000/04 (rev1), unless otherwise agreed in writing with the LPA.	Condition for spine road phase 2.
iv. Requirement to submit and implement a planting schedule, including	Via pre-commencement

⁷ As shown on Figure 7.4., Appendix B.4 of the Further Information relating to the Habitats Regulations Assessment (Annex A) and Environmental Impact Assessment (Annex B) dated August 2014

timescales, for each landscape element shown on Drwg. Nos 3000/06-3000/10 (rev 1) and planting to be undertaken.	condition for spine road phase 2.
v. Requirement to submit, and implement, a scheme of measures to ensure the continuity of bat flyways during construction and operation and the transition between these and timescales to establish soft landscaping to dissuade bats from crossing the spine road during operation.	Pre-commencement condition for spine road phase 1 and 2.
vi. Detailed early warning bat collision monitoring scheme, for the full length of the spine and secondary roads, including culverts, bridges, hop overs, lighting and landscaping to include: purpose, aims and objectives of monitoring; identification/provision of adequate baseline data; appropriate success criteria, thresholds, triggers, targets against which effectiveness of mitigation can be monitored and judged; methods of data gathering and analysis; location of points/areas where monitoring will be undertaken; timing and duration of monitoring; responsible persons and lines of communication; review and publication of results/outcomes; adaptive management that will be implemented if monitoring shows that measures are ineffective or not reaching stated aims and objectives. Adaptive management may include: <ul style="list-style-type: none"> • Additional landscaping to guide bats to safe crossing points; • Removal of landscaping to dissuade bats from crossing at unsafe points; • Additional dissuasive lighting; • Walls/fences at hop overs to increase flight heights and reduce collision risk. 	Via condition and S106 agreement.
vii. Responsibility and long-term management of culverts, associated landscaping and wider spine road landscaping.	Via S106 agreement.
viii. Requirement that the spine road be lit in accordance with Northern Quarter Lighting Strategy (Rev A, April 2014 and Drg. Nos 1301-1305 (Rev 3) unless otherwise agreed in writing with the LPA.	Via condition for spine road phase 1 and 2.
<p>(Box E) Outcome of additional mitigation measures Adverse effects (Box A) can be mitigated by measures set out in Box B & Di - viii and it is therefore ascertained that the imposition of the above measures in the form of planning conditions and/or obligations will avoid/cancel road collision and severance impacts associated with lesser horseshoe bat flyways from the project. No residual impacts are expected.</p>	
<p>(Box F) Integrity test conclusion summary Subject to the imposition/incorporation of the additional mitigation measure/s set out above, it is ascertained that the project would not adversely affect the integrity of the Wye Valley and Forest of Dean Bat Sites SAC as a result of road collision and severance impacts associated with lesser horseshoe bat flyways.</p>	
<p>(Box G) Assumptions/limitations</p> <ol style="list-style-type: none"> 1. As funding for the enhancement proposal to create a bat bridge for flyway 3 across the A4136 has not been secured, it is not considered a deliverable element of the project and has therefore been excluded from the assessment. 2. Traffic speed along the spine road at flyway 4 is likely to be relatively low due to its proximity to the junction with the A4136 which lies 40m away, further reducing the likelihood of collisions in addition to the lighting and landscaping mitigation proposed. 3. The surveys undertaken to gain an understanding of commuting (including key flyways) are considered appropriate to the potential project impacts. The survey methodologies employed have sought to provide a representative sample of bat movements. They cannot describe the movements of every individual bat. 4. Describing wider dispersal patterns and attributing percentage use of individual flyways relies on analysis of survey data collected and, to an extent, interpretation of this using professional judgement of the ecological consultant engaged by the project proposer based on an in depth knowledge of lesser horseshoe bat ecology and 	

personal experience from similar work elsewhere.

5. Unseasonably low night time temperatures prevented radio tracking in April and May 2013 and is likely to have resulted in unrepresentative bat activity during transect and static logger surveys associated with this same period⁸.

6. The flight behaviour of the lesser horseshoe bat is not fully understood. Literature indicates that whilst the species is more likely to use linear features when commuting (because such features are thought to aid navigation and provide foraging opportunities and shelter from wind and predators⁹) they may cross gaps in cover in excess of 200m when suitably dark conditions occur¹⁰. It is therefore assumed that individual lesser horseshoe bats, dispersing more widely south and west from the existing artificial roost, could potentially cross over the spine road or other roads in dark conditions despite of open adjacent landscaping as proposed.

7. The maximum height for heavy goods vehicles in the UK is 4.9m. Bats crossing roads at heights of below 5m are therefore at risk of collision and cannot be considered to have crossed at a 'safe' height¹¹. Many vehicles are approximately 2m in height and so the risk of collision is likely to increase further when bats fly across roads at or below this height. Flight heights of lesser horseshoe bats are known to vary with: cover (survey work undertaken for this project recorded lesser horseshoe bats flying as low as 1m in open habitat and up to 6m high in dense linear vegetation, although elsewhere lesser horseshoe bats have more often been recorded flying at up to 4m in cover); topography and; light levels (lesser horseshoe bats may cross gaps in vegetation at lux levels not exceeding 1 lux, flight heights stay below 1m at levels of 4 lux and may increase up to 4m at 1lux). Collision risk may be further increased with increase in traffic speeds and/or volumes. In Wales some lesser horseshoe bats have been observed 'dodging' road traffic but in the same stretch of road have also been observed colliding with traffic¹². It is therefore assumed that individual lesser horseshoe bats, dispersing more widely south and west, could potentially cross over the spine or other roads at unsafe heights but this would be dependent on local topography, vegetation cover, natural and artificial light levels at that time and cannot be easily predicted in pre-development.

8. In the region of 83.5% to 98.5% of the lesser horseshoe bat movements associated with the Northern Quarter lesser horseshoe bat colony occur along major and minor flyways 1 to 5.

9. Figure 7.4 (Annex B.4 Further information relating to the Habitats Regulations Assessment (Annex A) and Environmental Impact Assessment, August 2014) indicates that up to 65% of the Northern Quarter colony movements, between their roosts and foraging areas occur along flyways 1 and 2. The proportion of these bats that will cross the spine road via the proposed culverts cannot be predicted with accuracy pre-development. The extent to which usage occurs will depend greatly on the effectiveness of soft landscaping and other ancillary measures and their ability to funnel bats to and through the culverts. Extent of usage can only be established with any accuracy using early warning monitoring following the commencement of spine road development.

10. The proportion of bat movements associated with the Northern Quarter lesser horseshoe bat colony that are likely to cross the spine road at points other than in proximity to the culverts (flyways 1&2) pre-development is difficult to assess. Figure 7.4 (Annex B.4 Further information relating to the Habitats Regulations Assessment (Annex A) and Environmental Impact Assessment, August 2014) indicates that between 1.5 and 16.5% of the Northern Quarter colony bat movements do not occur along flyways 1 to 4 but instead occur more widely. No further quantified analysis of this wider dispersal has been provided by the project proposer. Some of these more widely dispersing individuals are likely to forage entirely within the Hawkwell Inclosure negating the need to cross the spine road. However, given that woodland foraging areas for the colony also lie to the north, south and west of the site it would be reasonable and precautionary to assume that up to two thirds of these more widely occurring movements would cross the spine road at points other than in proximity to the culverts. It is further assumed, that the majority of these bat movements would occur along retained dark linear corridors such as the Lake inlet and outlet streams passing under the spine road via the two proposed bridges. However, the proportion that might do this cannot be reasonably predicted with any further accuracy and could only be established by post

⁸ ES Addendum (June 2014) Appendix 7.4 AEWB Bat Survey section 4.1.5

⁹ Verboom, B., Huitema, H. (1997). The importance of linear landscape elements for the *Pipistrellus pipistrellus* and the serotine bat *Eptesicus serotinus*. Landscape Ecology vol. 12 no. 2 pp 117-125

¹⁰ Wells, D., Downs, N., Reason, P.R., Wray, S., Williams-Davies, L., Cresswell, W.J. & Sutton, G. (2004). Bats in the Landscape Project: The National Trust Sherborne Park Estate. Cresswell Associates, Stroud

¹¹ Berthinussen, A. Altringham, J. (2012). Do Bat Gantries and Underpasses Help Bats Cross Roads Safely? PLoS ONE 7(6): e38775. doi:10.1371/journal.pone.0038775

¹² Billington G (2003). A66 Stainburn & Great Clifton Bypass, Cumbria. Mitigation Assessment: Scale Beck Woodland Monitoring, August 2002/July 2003. Greena Ecological Consultancy

development early warning monitoring.

11. Because of the limitations and assumptions and large range of variables set out in the rest of this section predicting road collision mortality rates pre-development cannot be undertaken with any level of reasonable certainty and could only be established by early warning monitoring following the commencement of spine road development.

12. Eventual use of replacement roosts RR1 and RR2b by lesser horseshoe bats may be substantive. Major flyway routes between these and the existing artificial roost may evolve over time as a consequence. However the way in which they evolve could only be established through early warning monitoring following the commencement of spine road development.

Table 2d - Wye Valley and Forest of Dean Bat Sites SAC – vegetation loss/damage and lighting impacts associated with lesser horseshoe bat flyways

<p>(Box A) Potential adverse effect identified by screening process</p>	<p>The project site does not contain any European Site. However, some of the buildings within it and close to support a maternity colony of lesser horseshoe bats, whose population exceeds 355 individuals. These bats over-winter within in the Wye Valley and Forest of Dean Bat Sites SAC. As such this lesser horseshoe bat colony is considered a qualifying feature of the European Site. Bats disperse from these buildings along flyways to forage areas in surrounding woodland. Lesser horseshoe bats are known to commute along woodland edges. Lesser horseshoe bats are sensitive to habitat loss/degradation along flyways which can result in an increase in energy balances as individual bats avoid gaps in vegetation and instead commute via longer alternate routes¹³. They are also sensitive to light along flyways, which can have similar effects to habitat loss/degradation and which in addition can increase the risk of predation. Several minor and major flyways cross the project area and its mitigation areas beyond. The screening has identified that there is a risk of increased bat mortality and/or reduced breeding success as a result of potential vegetation loss/damage and lighting impacts from construction and mitigation proposals along flyways 1A-C, 2, 4 and 5.</p>
<p>(Box B) Information and incorporated mitigation measures to address affect from project proposer</p> <p>Soft landscaping for Phase 1 (Design and Access Statement revised p12-13, College Landscape Strategy dated 12/6/14, Soft Landscape Works Maintenance and Management Proposals dated 16/4/2014 and Drwg. No 05 (rev C).</p> <p>Soft Landscaping for Phase 2 (Design and Access Statement revised p12-13, Spine Road Drwg. Nos 3000/06- 3000/10 (rev 1) and 3000/11(rev 1), 3000/12-3001/14</p> <p>Vegetation protection for Phase 2 (Drwg. Nos 3000/01-05 (rev 1)</p> <p>College Lighting strategy (External lighting scheme strategy 11/4/14, Drwg. No E97-01-01 (rev 15)</p> <p>Spine Road lighting strategy (Northern Quarter Lighting Strategy (Rev A, April 2014, Drg. Nos 1301-1305 Rev 3)</p> <p>Construction Environmental Management Plan (CEMP) would be prepared for phase 1 and 2 construction including night working limits, dust prevention lighting, retained vegetation and protective fencing (ES Addendum 7.275, 7.375). Phase 1: Outline CEMP (Further information request response Appendix B.2 Aug 2014).</p> <p>Temporary flyway retention during construction of spine road (ES Addendum 7.374b)</p>	<p>(Box C) Appropriate assessment outcome</p> <p>It is agreed in principle that the quantum and location of the development proposed will allow vegetation and dark conditions along major flyways 1 and 2 to be retained through: retention/protection of significant areas of existing vegetation; additional landscaping to replace unavoidable loss of other vegetation; lighting strategies; set back of development from woodland edges etc. (as set out in Box B).</p> <p>In the absence of detailed CEMPs (for all phases) and management details (for all phases excepting the college) there are doubts about how green infrastructure will be protected during construction and how its long-term management will be secured during operation.</p> <p>In the absence of detailed CEMPs (for all phases) and lighting strategies (for all phases excepting the college and spine road) there are doubts about how dark conditions along and within green infrastructure will be protected during construction and how its long-term management will be secured during operation.</p> <p>As such, in relation to flyway mitigation there is uncertainty about the effectiveness, reliability, timing and its delivery cannot be guaranteed. As such only moderate weight has been afforded or reliance placed on this mitigation and there it is not sufficiently certainty that mitigation measures currently proposed will cancel or avoid adverse effects on the integrity of the European Site.</p>

¹³ Schofield H.W. (1996). *The ecology and conservation biology of Rhinolophus hipposideros, the lesser horseshoe bat*. Unpublished PhD Thesis, University of Aberdeen.

Box D: Additional mitigation measures required to address uncertainty or residual effects identified in box C	When and how will the measure be embedded in the project?
i. Requirement to undertake soft landscaping in accordance with the Landscape Strategy dated 12/6/14, Soft Landscape Works Maintenance and Management Proposals dated 16/4/2014 and Drwg. No 05 (rev C) unless otherwise agreed in writing with the LPA.	Via condition for plot E (the College)
ii. Requirement to submit and implement vegetation protection and clearance details, trees to be protected in accordance with BS5837:2012	Via pre-commencement condition for plot E and E2 and all reserved matters plots.
iii. Requirement to undertake landscaping and vegetation clearance/protection for the spine road in accordance with submitted details and BS5837:2012	See for conditions b) and c) of table 2c.
iv. Requirement to submit, and implement, detailed CEMPs in accordance with submitted details and BS42020:2013.	See for conditions b) and c) of table 2a.
v. Long term maintenance of green infrastructure (including water courses and other retained linear features).	Via S106 agreement.
vi. Requirement to submit a landscaping scheme, vegetation protection and clearance details (in accordance with BS5837:2012) and lighting strategy to respect ecological corridors.	Via pre-commencement condition for all reserved matter plots.
vii. Requirement to implement lighting in accordance with the External Lighting Scheme Strategy (dated 11/04/2014) and Drwgs. P13-253-M50-RF-20 (rev P2) and E97-01-01 (rev 15).	Via condition for plot E
viii. Requirement to submit, and implement, a building management system to control internal light spill from the college.	Pre-operation condition for plot E (the College).
ix. Requirement to submit, and implement, a detailed early warning bat flyway monitoring scheme (including rectification measures) for flyways 1 and 2 and other ecological corridors to include: purpose, aims and objectives of monitoring; identification/provision of adequate baseline data; appropriate success criteria, thresholds, triggers, targets against which effectiveness of mitigation can be monitored and judged; methods of data gathering and analysis; location of points/areas where monitoring will be undertaken; timing and duration of monitoring; responsible persons and lines of communication; review and publication of results/outcomes; adaptive management that will be implemented if monitoring shows that measures are ineffective or not reaching stated aims and objectives.	Via condition and S106 agreement.
<p>(Box E) Outcome of additional mitigation measures Adverse effects (Box A) can be mitigated by measures set out in Box B & Di - ix and it is therefore ascertained that the imposition of the above measures in the form of planning conditions and/or obligations will cancel/avoid mortality associated with vegetation loss/damage and lighting impacts associated with lesser horseshoe bat flyways from the project. No residual impacts are expected.</p>	
<p>(Box F) Integrity test conclusion summary Subject to the imposition/incorporation of the additional mitigation measure/s set out above, it is ascertained that the project would not adversely affect the integrity of the Wye Valley and Forest of Dean Bat Sites SAC as a result of vegetation loss/damage and lighting impacts associated with lesser horseshoe bat flyways.</p>	
<p>Assumptions/limitations</p> <ol style="list-style-type: none"> The surveys undertaken to gain an understanding of commuting (including key flyways) are considered appropriate to the potential project impacts. The survey methodologies employed have sought to provide a representative sample of bat movements. They cannot describe the movements of every individual bat. Describing wider dispersal patterns and attributing percentage use of individual flyways relies on analysis of survey data collected and, to an extent, interpretation of this using the professional judgement based on an in depth knowledge of lesser horseshoe bat ecology and personal experience from similar work elsewhere. Following adoption of replacement roosts RR1 and RR2b (due for construction during 2014/5) by lesser 	

horseshoe bats it is assumed that commuting and foraging from these roosts will occur over a larger area to the south and west and that new main commuting routes may become established between RRI and RR2b although the extent and exact locations of forage area and commuting routes cannot be predicted.

4. From information provided by the project proposer (ES Addendum Appendix 7.4, 6.5.30) it is assumed that a proportion of the Northern Quarter lesser horseshoe colony (approx. 20% or 70 individuals based on 2013 peak counts) do not disperse along flyways 1 to 4 but instead disperse more widely. Some of these individuals are likely to fly south on occasion utilising existing tree/scrub lines¹⁴ as shown on the Phase 1 habitat survey for the project proposal¹⁵ (Fig. 7.3). This is to some extent confirmed by transect survey data¹⁶. As the spine road and the service road to plot H will pass through these tree lines it is reasonable to assume that bats utilising these features as a commuting route will be at risk of collision with vehicles.

¹⁴ H.W. Schofield. 2008. Lesser horseshoe Bat Conservation Handbook.

¹⁵ Environmental Statement, Vol3 Part 3, Figure 7.3.

¹⁶ ES Addendum, Appendix 7.4 Bat Survey Report Figure E5

Table 2e - Wye Valley and Forest of Dean Bat Sites SAC -operational disturbance to lesser horseshoe bat roosts

<p>(Box A) Potential adverse effect identified by screening process</p>	<p>The project site does not contain any European Site. However, some of the buildings within and close to it support a maternity colony of lesser horseshoe bats whose population exceeds 355 individuals. These bats over-winter within the Wye Valley and Forest of Dean Bat Sites SAC. As such this lesser horseshoe bat colony is considered a qualifying feature of the European Site. The screening has identified that there is a risk of recreational disturbance and in particular vandalism to replacement and remaining roosts that will remain in situ during operation of the project.</p>	
<p>(Box B) Information and incorporated mitigation measures to address affect from project proposer Pedestrian and cycle routes layouts (Design and Access Statement revised p65, Pedestrian and Cycle Network Illustrative Plan)</p>	<p>(Box C) Appropriate assessment outcome It is agreed that, due to distance, replacement roost RR2b and the night roosts will be not be subject to recreational disturbance from the project. These roosts are isolated, well secluded and will be established in advance of residential development. It is not agreed that the existing artificial roost and replacement roost RR1 will not be subject to recreational disturbance due to their proximity to the project.</p>	
<p>Pavements and swale layouts for central section of spine road (Spine Road Landscape proposals Drwg. Nos. 3000/06, 3000/07 rev 1)</p>		
<p>Public open space provision including the Lake and play space (Design and Access Statement revised p87, Green Infrastructure Strategy)</p>	<p>It is agreed that the illustrative masterplan and spine road drawings demonstrate how additional recreational access to the Hawkwell Inclosure can be reduced through: pedestrian and cycle routes layouts; pavement and swale layouts and; open space provision within the development. However, it is not agreed that this mitigation will cancel recreational disturbance.</p> <p>Given the above assessment little weight has been afforded or reliance placed on this mitigation and it is not sufficiently certain that mitigation measures currently proposed will cancel or avoid adverse effects on the integrity of the European Site.</p>	
<p>Box D: Additional mitigation measures required to address uncertainty or residual effects identified in box C</p>	<p>When and how will the measure be embedded in the project?</p>	
<p>i. Requirement to implement spine road pavement and drainage proposals in accordance with Drwg. Nos Spine Road general arrangement 202-204 (rev 5) and Landscape proposals 3000/06-07 (rev 1)</p>	<p>Via condition.</p>	
<p>ii. Requirement to submit measures to discourage additional access to the Hawkwell Inclosure.</p>	<p>Via condition/S106 agreement.</p>	
<p>iii. Requirement to provide and maintain public open space provision.</p>	<p>Via condition/S106 agreement.</p>	
<p>iv. Requirement to submit, and implement, a detailed early warning monitoring scheme for recreational disturbance at the existing artificial roost and replacement roost to include: purpose, aims and objectives of monitoring; identification/provision of adequate baseline data; appropriate success criteria, thresholds, triggers, targets against which effectiveness of mitigation can be monitored and judged; methods of data gathering and analysis; location of points/areas where monitoring will be undertaken; timing and duration of monitoring; responsible persons and lines of communication; review and publication of results/outcomes; adaptive management that will be implemented if monitoring shows that measures are ineffective or not reaching stated aims and objectives.</p> <ul style="list-style-type: none"> • Measures to dissuade access such as defensive planting; • Measures to further increase secureness of roosts dependant on nature of vandalism risk assessed. 	<p>Via condition and S106 agreement.</p>	
<p>(Box E) Outcome of additional mitigation measures Adverse effects (Box A) can be mitigated by measures set out in Box B & Di - iv and it is therefore ascertained that the imposition of the above measures in the form of planning conditions and/or obligations will avoid/cancel any</p>		

operational disturbance to lesser horseshoe bat roost from the project. No residual impacts are expected.

(Box F) Integrity test conclusion summary

Subject to the imposition/incorporation of the additional mitigation measure/s set out above, it is ascertained that the project would not adversely affect the integrity of the Wye Valley and Forest of Dean Bat Sites SAC as a result of operational disturbance to lesser horseshoe bat roosts.

(Box G) Assumptions/limitations

1. The number of people working and living within close proximity to the existing artificial roost and replacement roost RR1 will increase significantly as a result of the project. It is assumed that those living and working within the project area will to some extent access woodlands that surround the existing artificial roost and replacement roost RR1 for recreational purposes via existing PROWs and other existing access points. It is not possible to quantify the extent of such access but it is reasonable to assume that recreational activity within woodland surrounding the existing artificial roost, and to a lesser extent replacement roost RR1, will increase above the pre-development baseline.
2. Walking, cycling and other quiet recreational activity within the woodland surrounding the existing artificial roost and replacement roost RR1 are associated with very low noise and vibration emissions and so disturbance from such sources is not expected to be significant. Increased human presence within surrounding woodland may increase the risk of anti-social behaviour including vandalism of the existing artificial roost and replacement roost RR1 which has the potential to be significant.
3. Planning permission covering design and landscaping has been given for RR1 and RR2b. Consultation was undertaken with Natural England prior to approval.
4. The existing artificial roost has been constructed to reduce vulnerabilities to vandalism and the proposed roosts have been designed in the knowledge of the success of the existing artificial roost.
5. There is no evidence to indicate that numbers of bats in the existing artificial roost have been impacted by recreational disturbance previously as numbers of bats has continued to increase in the roost.
6. RR1, RR2b and the existing artificial roost will be managed by the Forest of Dean District Council on a 50 year lease.

Table 2f - Wye Valley and Forest of Dean Bat Sites SAC – lesser horseshoe bat forage habitat loss

<p>(Box A) Potential adverse effect identified by screening process</p>	<p>The project site does not contain any European Site. However, some of the buildings within and close to it support a maternity colony of lesser horseshoe bats whose population exceeds 355 individuals. These bats over-winter within the Wye Valley and Forest of Dean Bat Sites SAC. As such this lesser horseshoe bat colony is considered a qualifying feature of the European Site.</p> <p>Published research indicates that half of the foraging around large roosts like the Northern Quarter can be expected to occur within 600m of a roost and much of the rest within 2-3km although some individuals may range even further (6-10km) if for example competition is high or forage habitat sparse.</p> <p>The screening has identified that there is potential for bat mortality to increase as a result of permanent forage habitat loss directly from development of areas near to the existing artificial roost and from creation of open grassland habitat for mitigation in surrounding areas.</p>
<p>(Box B) Information and incorporated mitigation measures to address affect from project proposer</p>	<p>(Box C) Appropriate assessment outcome</p> <p>It is agreed that the core forage area for the Northern Quarter colony encompasses woodland within a 1.5km radius of the existing roosts and that the total foraging area rarely extends more than 2.5km from this roost (see Box G below for further details).</p>
<p>Phase 1 – creation/restoration of 6.3ha of potential forage habitat (including 1.54ha woodland, 0.04ha scrub, 4.72ha of grassland) (ES Addendum Table 7.3.1b and Fig. 7.7)</p>	
<p>Phase 2 – creation/restoration/enhancement of 29.69ha of potential forage habitat (including 12.95ha woodland and 17.74ha of grassland) (ES Addendum Table 7.3.1b and Figs. 7.6 & 7.7)</p>	<p>It is agreed that the project will result in the permanent loss of 25.54ha of potential forage habitat and that this represents a relatively small loss of core forage area (5.2%), and an even smaller loss of total forage area (2.1%).</p>
<p>Landscaping of mitigation areas MP-1A, MP2(F)A and MP-2(R)D (ES Addendum Fig 7.8, 7.9 and Appendix 7.11 and Forestry Commission Plan MP-2(R)D HI2092014 dated 12/09/2014) to increase forage habitat quality through inclusion of irregular scrubby edges, pond creation and use of mature stock planting</p>	<p>It is agreed that the overall quantity of woodland, scrub and grassland creation, restoration and enhancement proposed will reduce the impacts of potential forage habitat loss. It is further agreed that the quality of these habitats, because of inclusion of specific measures (such as mature stock planting, pond creation and inclusion of irregular scrubby edges) would cancel long-term impacts of potential forage habitat loss. However, it is uncertain whether these specific measures would be sufficient to fully cancel short-term impacts of forage habitat loss.</p>
<p>Gradual conversion of conifer to broadleaf woodland with understory (such as MP-2(R), C and D) within the core forage area (Further information request response Appendix B.3 Aug 2014)</p>	<p>There is uncertainty as to whether light spill from existing highway lighting along the A4136 would reduce the effectiveness of woodland edge forage habitat in the northern section of MP-2(R)D (as shown on Forestry Commission Plan MP-2(R)D HI2092014 dated 12/09/2014).</p> <p>There is uncertainty as to whether mitigation works within mitigation area MP-2(R)D may cause temporary severance of flyway 5.</p> <p>Given the above only moderate weight has been afforded or reliance placed on this mitigation and there it is not sufficiently certainty that mitigation measures currently proposed will cancel or avoid adverse effects on the integrity of the European Site.</p>

Box D: Additional mitigation measures required to address uncertainty or residual effects identified in box C	When and how will the measure be embedded in the project?
i. Requirement to undertake forage habitat improvements for all mitigation areas in accordance with Appendix B.3 and B.4 of the Further Information Request Response (dated Aug 2014) and with Figure 7.7, excepting MP-2(R)D , which should be undertaken in accordance with Forestry Commission Plan MP-2(R)D HI2092014 dated 12/09/2014.	Via condition and S106 agreement
ii. Requirement to undertake tree clearance in a gradual and/or phased way for all MP2 mitigation areas, where such works are necessary to achieve stated management objectives, to prevent flyway severance and short-term significant loss of forage habitat.	Via condition and S106 agreement.
iii. Requirement to submit, and implement, a detailed early warning monitoring scheme for forage area mitigation effectiveness to include: purpose, aims and objectives of monitoring; identification/provision of adequate baseline data; appropriate success criteria, thresholds, triggers, targets against which effectiveness of mitigation can be monitored and judged; methods of data gathering and analysis; location of points/areas where monitoring will be undertaken; timing and duration of monitoring; responsible persons and lines of communication; review and publication of results/outcomes; adaptive management that will be implemented if monitoring shows that measures are ineffective or not reaching stated aims and objectives. Adaptive management may include additional planting and further vegetation protection measures.	Via condition and S106 agreement.
iv. Requirement to submit details to counteract light spill from highway lighting along the A4136 within mitigation area MP-2(R)D.	Via condition and S106 agreement
<p>(Box E) Outcome of additional mitigation measures Adverse effects (Box A) can be mitigated by measures set out in Box B & Di - iii and it is therefore ascertained that the imposition of the above measures will cancel lesser horseshoe bat forage habitat loss from the project. No residual impacts are expected.</p>	
<p>(Box F) Integrity test conclusion summary Subject to the imposition/incorporation of the additional mitigation measure/s set out above, it is ascertained that the project would not adversely affect the integrity of the Wye Valley and Forest of Dean Bat Sites SAC as a result of – lesser horseshoe bat forage habitat loss.</p>	
<p>(Box G) Assumptions/limitations</p> <p>1. Lesser horseshoe bats are ‘clutter adapted’. Whilst studies from elsewhere indicate that lesser horseshoe bats forage in a range of habitats (including mixed and conifer woodland, bare areas, water, riparian vegetation, settlements, arable and pasture) literature suggests that they actively avoid commuting across, and hunting in, open areas and indicates that they pre-dominantly and preferentially forage in broadleaf woodland and along and within 5m of woodland edges, tree lines and hedgerows¹⁷. Literature also indicates that ‘normal’ home ranges for lesser horseshoe bats are between 2-3km (although they may extend to over 4km for some animals) and that home ranges of heavily pregnant animals may decrease to 1km or less (for example 600m) if habitat quality is good. Radio tracking results for the project site generally agree with the literature indicating that the core foraging area for the Northern Quarter colony consists of woodland (broadleaf, mixed and conifer) with 1.5km of the existing roosts and that majority of individuals also forage within woodland up to 2.5km from the of the existing roosts (with occasional individuals extending up to 3.5km). It is assumed that the core forage area is slightly larger due to large population size of the colony and/or the pre-dominance of the surrounding sub-optimal mixed and conifer woodland.</p> <p>2. Overall forage area loss figures are cautious as they include significant areas of grassland the majority of which is unlikely to be used for foraging because of its open nature.</p>	

¹⁷ Bontadina, F., Schofield, H. and Naef-Daenzer, B. (2002), Radio-tracking reveals that lesser horseshoe bats (*Rhinolophus hipposideros*) forage in woodland. *Journal of Zoology*, 258: 281–290. doi: 10.1017/S0952836902001401

3. 'No net loss' of lesser horseshoe forage habitat can potentially be achieved in several ways. Where potential forage habitat loss is expected creation of additional new woodland areas, where possible, would be the normal approach. However, opportunities to create new woodland within 2.5km of the project site are severely limited due to it being surrounded by extensive forest already. Given this measures that will improve the quality of existing woodland habitat (e.g. restoration of conifer plantation to broadleaf woodland and improvements to the structure of existing broadleaf woodland) are considered an acceptable alternative. This approach effectively achieves no net loss by providing smaller optimal woodland forage areas in exchange for larger but sub-optimal woodland forage areas.

4. Night roosts are thought to be used by lesser horseshoe bats for a number of purposes including the digestion of prey, resting in between foraging bouts and communal behaviour. Published research postulates night roosts are integral to the home range/core area of lesser horseshoe bats and that these ranges/areas could be extended by increasing the availability of night roosts¹⁸. As replacement roosts RR1 and RR2b (due for construction 2014) both lie within the core forage area of the Northern Quarter lesser horse colony it is reasonable to assume that some individuals from the colony will find and utilise these replacement roosts as night roosts using them to extend their ranges with beneficial consequences. However, the number of individuals using the replacement roosts in this way cannot be predicted with any accuracy, and any benefit would greatly depend on the quality of forage habitat made available. As a precaution this potentially positive impact has therefore not been taken account of within the assessment.

5. It is widely accepted that measures such as conversion of conifer to broadleaf, understorey and pond creation and inclusion of mature stock planting and irregular scrubby edges etc. can improve the foraging quality of woodlands for bats in the medium to long term. However, there is little, if any literature, available to demonstrate that such newly created features could immediately support a sufficient biomass of invertebrates to replace those that would have otherwise been supported by mature conifer/mixed woodland proposed for removal.

6. Broadleaf woodland creation areas will remain of value to LHB's whilst broadleaf planting establishes. Recently felled area will retain understorey, although very damaged during felling, and areas of brash from felling arising's. Brash features, decaying arising's and patches of disturbed ground¹⁹ creates a variety of environments for a range of species.

Table 2g - Wye Valley and Forest of Dean Bat Sites SAC summary

Integrity test conclusion summary

Subject to the imposition/incorporation of the additional mitigation measure/s set out in Tables 2a-f above, it is ascertained that the project would not adversely affect the integrity of the Wye Valley and Forest of Dean Bat Sites SAC.

11. References and reports

None.

12. Further supplementary information

None.

13. Date and author

Date: Thursday, 30th October 2014

Author: Forest of Dean District Council, Sustainability Team, Alastair Chapman

14. Consultation with SNCB

14.1. Natural England was consulted about version 1 of the draft Appropriate Assessment (dated 22nd August 2014). Natural England provided its comments on this draft in a letter to the Local Planning Authority dated 11th September 2014.

¹⁸ Knight, T., Jones, G. (2009). Importance of night roosts for bat conservation: roosting behaviour of the lesser horseshoe bat *Rhinolophus hipposideros*. *Endangered Species Research*, Vol. 9 (1-2), 07.

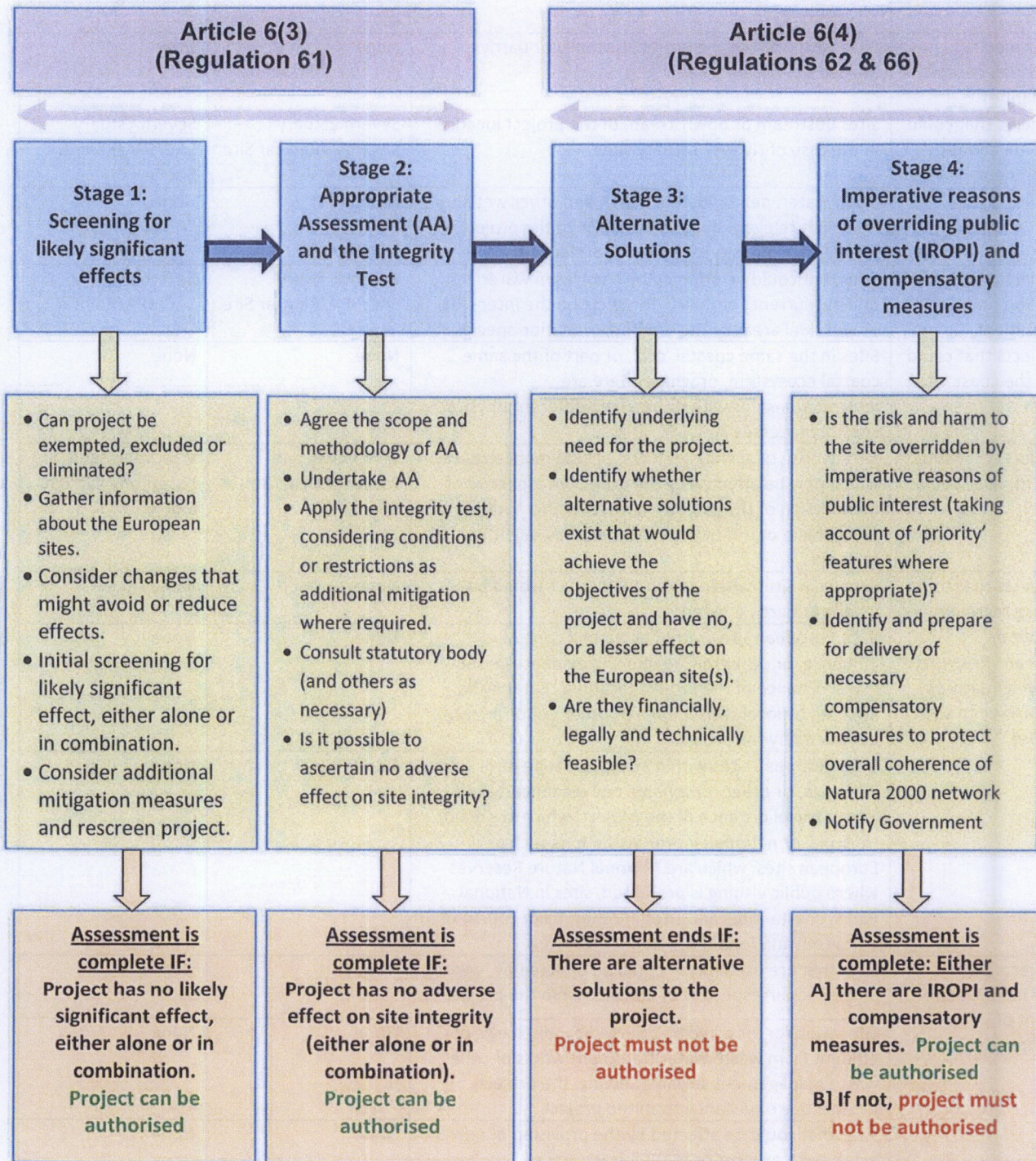
¹⁹ Forestry Commission (2006) *Managing brash on conifer clear-fell sites*.

14.2. The draft Appropriate Assessment was subsequently revised and re-issued by the LPA for further consultation with Natural England on 18th September 2014. In its letter dated 30th September 2014 Natural England confirmed its agreement with the conclusions of the revised draft Appropriate Assessment.

14.3. Changes to mitigation proposals were made after the 30th September. Natural England were consulted and responded in a letter to the LPA dated 15th October 2014.

14.4. Natural England responded to the 24th October 2014 Appropriate Assessment on the 30th October 2014. Natural England in its letter of the 30th October confirmed its agreement with the conclusions of the revised (24th October 2014) Appropriate Assessment, where upon this comment was added and the date of the assessment updated to the 30th October 2014.

Outline of the four stage approach to the Habitats Regulations Assessment of projects



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Appendix 2. List used to scan for and select European Sites potentially affected by the project

Scanning and site selection list for European sites that could potentially be affected by a project			
Types of project	Sites to scan for and check	Names of sites selected at preliminary screening	Names of sites selected at re-screening
1. All projects (terrestrial, coastal and marine)	Sites within which the project is wholly or partly located	None	None
2. Projects that could affect the aquatic environment	Sites upstream or downstream of the project location in the case of river or estuary sites	Severn Estuary SAC/SPA/Ramsar Site	Severn Estuary SAC/SPA/Ramsar Site
	Open water, peatland, fen, marsh and other wetland sites with relevant hydrological links to the project, irrespective of distance from the project location	None	None
3. Projects that could affect the marine environment	Sites that could be affected by changes in water quality, currents or flows; or effects on the inter-tidal or sub-tidal areas or the sea bed, or marine species	Severn Estuary SAC/SPA/Ramsar Site	Severn Estuary SAC/SPA/Ramsar Site
4. Projects that could affect the coast	Sites in the same coastal 'cell', or part of the same coastal ecosystem, or where there are interrelationships with or between different physical coastal processes	None	None
5. Projects that could affect mobile species	Sites whose qualifying features include mobile species which may be affected by the project irrespective of the location of the project or whether the species would be in or out of the site when they might be affected	Wye Valley and Forest of Dean Bat SAC	Wye Valley and Forest of Dean Bat SAC
6. Projects that could increase recreational pressure on European sites where qualifying features are sensitive to such pressure	European sites within which the project would be wholly or partly located	None	None
	Such European sites within an agreed zone of influence, or other reasonable and evidence-based travel distance of the project location, that may be affected by local recreational or other visitor pressure generated by the project	None	None
	Such European sites within an agreed zone of influence, or other reasonable and evidence-based longer travel distance of the project, which are major (regional or national) visitor attractions such as European sites which are National Nature Reserves where public visiting is promoted, sites in National Parks, coastal sites and sites in other major tourist or visitor destinations	None	None
7. Projects that would increase the amount of development	Sites that are used for, or could be affected by, water abstraction irrespective of distance from the project	None	None
	Sites used for, or could be affected by, discharge of effluent from waste water treatment works or other waste management streams serving the project, irrespective of distance from the project	None	None
	Sites that could be affected by the provision of new or extended transport or other infrastructure	None	None
	Sites that could be affected by increased deposition of air pollutants arising from the proposals, including emissions from significant increases in traffic	Severn Estuary SAC/SPA/Ramsar Site, Walmore Common SPA/Ramsar Site	None

Scanning and site selection list for European sites that could potentially be affected by a project			
Types of project	Sites to scan for and check	Names of sites selected at preliminary screening	Names of sites selected at re-screening
8. Projects comprising linear developments or infrastructure	Sites within a specified distance from the centre line of the proposed route (or alternative routes), the distance may be varied for differing types of site / qualifying features and in the absence of established good practice standards, distance(s) to be agreed by the statutory nature conservation body	None	None
9. Projects that introduce new activities or new uses into the marine, coastal or terrestrial environment	Sites considered to have qualifying features potentially vulnerable or sensitive to the effects of the new activities proposed by the project	None	None
10. Projects that could change the nature, area, extent, intensity, density, timing or scale of existing activities or uses	Sites considered to have qualifying features potentially vulnerable or sensitive to the effects of the changes to existing activities proposed by the project	None	None
11. Projects that could change the quantity, quality, timing, treatment or mitigation of emissions or discharges to air, water or soil	Sites considered to have qualifying features potentially vulnerable or sensitive to the changes in emissions or discharges that could arise as a result of the project, over and above those already identified	None in addition to those already identified.	None in addition to those already identified.
12. Projects that could change the quantity, volume, timing, rate, or other characteristics of biological resources harvested, extracted or consumed	Sites whose qualifying features include the biological resources which the project may affect, or whose qualifying features depend on the biological resources which the project may affect, for example as prey species or supporting habitat or which may be disturbed by the harvesting, extraction or consumption	Wye Valley and Forest of Dean Bat SAC	Wye Valley and Forest of Dean Bat SAC
13. Projects that could change the quantity, volume, timing, rate, or other characteristics of physical resources extracted or consumed	Sites whose qualifying features rely on the physical resources which the project may affect, for example, as habitat or a physical environment on which habitat may develop or which may be disturbed by the extraction or consumption	None	None
14. Projects which could introduce or increase, or alter the timing, nature or location of disturbance to species	Sites whose qualifying features are considered to be potentially sensitive to disturbance, for example as a result of noise, activity or movement, or the presence of disturbing features that could be brought about by the project	Walmore Common SPA/Ramsar Site	None

Scanning and site selection list for European sites that could potentially be affected by a project			
Types of project	Sites to scan for and check	Names of sites selected at preliminary screening	Names of sites selected at re-screening
15. Projects which could introduce or increase or change the timing, nature or location of light or noise pollution	Sites whose qualifying features are considered to be potentially sensitive to the effects of changes in light or noise that could be brought about by the project	Wye Valley and Forest of Dean Bat SAC	Wye Valley and Forest of Dean Bat SAC
16. Projects which could introduce or increase a potential cause of mortality of species	Sites whose qualifying features are considered to be potentially sensitive to the source of new or increased mortality that could be brought about by the project	Wye Valley and Forest of Dean Bat SAC	Wye Valley and Forest of Dean Bat SAC
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Appendix 3. Information Required for Assessment Schedule

Walmore Common SPA and Ramsar Site	European Site conservation objectives	
	<p>The Conservation Objectives for this site are, subject to natural change, to maintain estuaries, inter-tidal mud and sand flats, saltmarsh and associated transition habitats and rocky littoral shores in favourable condition (or restored to favourable condition if features are judged to be unfavourable), with particular reference to any dependent component special interest features (habitats, vegetation types, species, species assemblages etc.) for which the land is designated. In particular to:</p> <ul style="list-style-type: none"> • To maintain the designated features in favourable condition, which is defined in part in relation to a balance of habitat extents (extent attribute). Favourable condition is defined at this site in terms of the following site-specific standards. Favourable condition to be assessed in terms of: extent. • To maintain the designated species Bewick Swan in favourable condition, which is defined in part in relation to their population attributes. Favourable condition is defined at this site in terms of the following site-specific standards: bird population size. • To maintain the Lowland neutral grassland at Walmore Common at SSSI in favourable condition, with particular reference to relevant specific designated interest features. Favourable condition is defined at this site in terms of the following site-specific standards: habitat extent; disturbance; landscape (unrestricted views and field size); flooding extent, depth and frequency; sward (bare ground extent, litter, height, structure, composition, various indicator species) • To maintain the Standing Open Water (ditch system) at Walmore Common SSSI in favourable condition, with particular reference to relevant specific designated interest features. Favourable condition is defined at this site in terms of the following site-specific standards: ditch feature extent; habitat functionality (water availability, water quality (clarity, algal dominance, chemistry)); habitat structure (channel form, in-channel, aquatic and bankside vegetation composition; non-native plant colonisation; rare/quality indicators (plants, NVC communities, invertebrates 	
Qualifying feature/s	FCS/condition summary	
Bewick Swan	Unfavourable no change (22/7/2013) due to poor water quality (nitrate and phosphate levels) in ditch system	

Severn Estuary SAC, SPA and Ramsar	European Site conservation objectives	
	<p>The Conservation Objectives for this site are, subject to natural change, to maintain estuaries, inter-tidal mud and sand flats, saltmarsh and associated transition habitats and rocky littoral shores in favourable condition (or restored to favourable condition if features are judged to be unfavourable), with particular reference to any dependent component special interest features (habitats, vegetation types, species, species assemblages etc.) for which the land is designated. In particular to:</p>	

Site	<ul style="list-style-type: none"> • To maintain the estuaries feature in favourable condition, with particular reference to relevant specific designated interest features. Favourable condition to be assessed in terms of: extent; morphology; tidal regime and flow; sediment budget; sediment size, range and distribution; water quality (physio-chemical parameters); phytoplankton; macroalgae; toxic contaminants; estuarine habitat extent, variety and spatial distribution; abundance of notable species/assemblages. • To maintain the intertidal mudflats and sandflats in favourable condition, with particular reference to relevant specific designated interest features. Favourable condition to be assessed in terms of: extent; mudflats and sandflats extent and variety; distribution; community composition; topography; sediment character. • To maintain the saltmarshes in favourable condition, with particular reference to relevant specific designated interest features. Favourable condition to be assessed in terms of: extent; distribution; extent of spartina anglica; zonation of vegetation; species composition; sward structure; morphology. • To maintain the hard substrate habitats in favourable condition, with particular reference to relevant specific designated interest features. Favourable condition to be assessed in terms of: extent and variety; spatial distribution; community composition; abundance of Eel grass. • To maintain the vascular plant assemblage in favourable condition, with particular reference to relevant specific designated interest features. Favourable condition to be assessed in terms of: rare/notable vascular plant presence; population size; vegetation structure; physical damage; disturbance; hydrology. • To maintain the assemblage of waterfowl and nationally important populations of waterfowl in favourable condition, with particular reference to relevant specific designated interest features. Favourable condition to be assessed in terms of: population size; distribution; disturbance to feeding/roosting areas; habitat (extent, food availability, vegetation characteristics, feeding/roosting sightlines). • To maintain the migratory fish assemblage in favourable condition, with particular reference to relevant specific designated interest features. Favourable condition to be assessed in terms of: barriers to migration (water quality, water flow, physical barriers); population size; prey species abundance.
Qualifying feature/s	FCS/condition summary
Estuaries; Mudflats and sandflats not covered by seawater at low tide; Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>); Sandbanks which are slightly covered by sea water all the time; Reefs; Sea lamprey; River lamprey; Twaite shad	Favourable
Birds (Bewick swan, Gadwall, Greater white-fronted goose, Dunlin).	Favourable

Wye Valley and Forest of Dean Bat Sites SAC	European Site conservation objectives	
	<p>With regard to the natural habitats and/or species for which the site has been designated ("the Qualifying Features" listed below); Avoid the deterioration of the qualifying natural habitats and the habitats of qualifying species, and the significant disturbance of those qualifying species, ensuring the integrity of the site is maintained and the site makes a full contribution to achieving Favourable Conservation Status of each of the qualifying features.</p> <p>Subject to natural change, to maintain or restore:</p> <ul style="list-style-type: none"> • The extent and distribution of qualifying natural habitats and habitats of qualifying species; • The structure and function (including typical species) of qualifying natural habitats and habitats of qualifying species; • The supporting processes on which qualifying natural habitats and habitats of qualifying species rely; • The populations of qualifying species; • The distribution of qualifying species within the site. <p>Favourable condition to be assessed in terms of: cave and roof roost space extent; woodland extent at roost entrances (Devils Chapel and Old Bow only) ; presence; population size (no drop in excess of 25% below notification population); disturbance; site security; roost condition (external/internal); roost access.</p>	
Qualifying feature/s	FCS/condition summary	
Lesser horseshoe bat	Favourable	
Greater horseshoe bat	Favourable	

Appendix 4. Summary outcomes of the screening

Preliminary screening (dated 22 May 2014)

Re-screening (dated 9 July 2014)

Screened out

- a) Potential adverse impacts on Walmore Common SPA and Ramsar Site from air pollution and disturbance.
- b) Potential adverse impacts on the Severn Estuary SAC, SPA and Ramsar Site from air pollution associated with increased traffic along the A48.
- c) Potential adverse impacts on the greater horseshoe bat qualifying feature of the Wye Valley and Forest of Dean Bat Sites
- d) Potential adverse impacts on the lesser horseshoe bat qualifying feature of the Wye Valley and Forest of Dean Bat Sites as follows:
 - Increased collision risks from increase of traffic along the A4136.

Screened in

- a) Potential adverse indirect effect of water pollution on the Severn Estuary SAC, SPA and Ramsar Site during construction.
- b) Potential adverse impacts on the lesser horseshoe bat qualifying feature of the Wye Valley and Forest of Dean Bat Sites as follows:
 - Disruption to flyways during construction, mitigation and operation;
 - Recreational disturbance of roosts during operation;
 - Major roost disturbance during construction and mitigation;
 - Major roost loss;
 - Forage habitat loss.

Appendix 5 – References and reports

- Completed application forms and ownership certificates;
- 'Red line' planning application site boundary (066_DI_04.5)
- Parameter plans, including:
 - Land Use – 066_DI_19.11 revision 2
 - Movement – 066_DI_35.5 revision 2
 - Block Plan – 066_DI_40.3 revision
 - Building Heights – 066_DI_34.4 revision
- Overall Illustrative Masterplan -066_DI_43.2 revision
- Detailed plans for the proposed spine road, including:
 - 3511417R-HHC/200 rev 7 Northern Quarter scheme plan
 - 3511417R-HHC/201 rev 5 Spine road general arrangement (Sheet 1 of 5)
 - 3511417R-HHC/202 rev 5 Spine road general arrangement (Sheet 2 of 5)
 - 3511417R-HHC/203 rev 5 Spine road general arrangement (Sheet 3 of 5)
 - 3511417R-HHC/204 rev 5 Spine road general arrangement (Sheet 4 of 5)
 - 3511417R-HHC/205 rev 5 Spine road general arrangement (Sheet 5 of 5)
 - 3511417R-HHC/206 rev 2 Spine road longitudinal section
 - 3511417R-HHC/207 rev 1 Spine road cross sections
 - 3511417R-HHC/208 rev 1 Extent of phase 1 spine road construction
 - 3511417R-HHC/211 rev 1 Spine road vehicle swept path analysis (Sheet 1 of 5)
 - 3511417R-HHC/212 rev 1 Spine road vehicle swept path analysis (Sheet 2 of 5)
 - 3511417R-HHC/213 rev 1 Spine road vehicle swept path analysis (Sheet 3 of 5)
 - 3511417R-HHC/214 rev 1 Spine road vehicle swept path analysis (Sheet 4 of 5)
 - 3511417R-HHC/215 rev 1 Spine road vehicle swept path analysis (Sheet 5 of 5)
 - 3511417R-HHC/220 rev 1 Vehicle swept path analysis at junctions (Sheet 1 of 4)
 - 3511417R-HHC/221 rev 1 Vehicle swept path analysis at junctions (Sheet 2 of 4)
 - 3511417R-HHC/222 rev 1 Vehicle swept path analysis at junctions (Sheet 3 of 4)
 - 3511417R-HHC/223 rev 1 Vehicle swept path analysis at junctions (Sheet 4 of 4)
 - 3511417R-HHC/231 rev 1 Extent of Proposed Spine Road Adoption (Sheet 1 of 5)
 - 3511417R-HHC/232 rev 1 Extent of Proposed Spine Road Adoption (Sheet 2 of 5)
 - 3511417R-HHC/233 rev 1 Extent of Proposed Spine Road Adoption (Sheet 3 of 5)
 - 3511417R-HHC/234 rev 1 Extent of Proposed Spine Road Adoption (Sheet 4 of 5)
 - 3511417R-HHC/235 rev 1 Extent of Proposed Spine Road Adoption (Sheet 5 of 5)
 - 3511417R-HHC/501 rev 1 Drainage strategy plan (Sheet 1 of 5)
 - 3511417R-HHC/502 rev 1 Drainage strategy plan (Sheet 2 of 5)
 - 3511417R-HHC/503 rev 2 Drainage strategy plan (Sheet 3 of 5)
 - 3511417R-HHC/504 rev 1 Drainage strategy plan (Sheet 4 of 5)
 - 3511417R-HHC/505 rev 1 Drainage strategy plan (Sheet 5 of 5)
 - 3511417R-HHC/1301 rev 3 Spine road street lighting (Sheet 1 of 5)
 - 3511417R-HHC/1302 rev 3 Spine road street lighting (Sheet 2 of 5)
 - 3511417R-HHC/1303 rev 3 Spine road street lighting (Sheet 3 of 5)
 - 3511417R-HHC/1304 rev 3 Spine road street lighting (Sheet 4 of 5)
 - 3511417R-HHC/1305 rev 3 Spine road street lighting (Sheet 5 of 5)
 - 3511417R-HHC/1700 rev 2 Structures location plan
 - 3511417R-HHC/1701 rev 2 Bat culvert No.1 (West) general arrangement
 - 3511417R-HHC/1702 rev 2 Bat culvert No.2 (East) general arrangement
 - 3511417R-HHC/1703 rev 2 Cinderford Brook crossing general arrangement
 - 3511417R-HHC/1704 rev 2 Old Engine Brook crossing general arrangement
 - 3511417R-HHC/3000/01 rev 1 Spine road vegetation clearance and protection (Sheet 1 of 5)
 - 3511417R-HHC/3000/02 rev 1 Spine road vegetation clearance and protection (Sheet 2 of 5)

- 3511417R-HHC/3000/03 rev 1 Spine road vegetation clearance and protection (Sheet 3 of 5)
- 3511417R-HHC/3000/04 rev 1 Spine road vegetation clearance and protection (Sheet 4 of 5)
- 3511417R-HHC/3000/05 rev 1 Spine road vegetation clearance and protection (Sheet 5 of 5)
- 3511417R-HHC/3000/06 rev 1 Spine road landscape proposals (Sheet 1 of 5)
- 3511417R-HHC/3000/07 rev 1 Spine road landscape proposals (Sheet 2 of 5)
- 3511417R-HHC/3000/08 rev 1 Spine road landscape proposals (Sheet 3 of 5)
- 3511417R-HHC/3000/09 rev 1 Spine road landscape proposals (Sheet 4 of 5)
- 3511417R-HHC/3000/10 rev 1 Spine road landscape proposals (Sheet 5 of 5)
- 3511417R-HHC/3000/11 rev 1 Spine road planting proposals phase 1 (Sheet 1 of 3)
- 3511417R-HHC/3000/12 Spine road planting proposals phase 1 (Sheet 2 of 3)
- 3511417R-HHC/3000/13 Spine road planting proposals phase 1 (Sheet 3 of 3)
- 3511417R-HHC/3000/14 Spine road planting proposals phase 1 fence details
- Detailed plans for the proposed College plot, including:
 - PL00 - Site Plan (Rev J)
 - PL01 - Block Plan
 - PL02 - Proposed Ground Floor Plan
 - PL03 - Proposed First Floor Plan
 - PL04 - Proposed Roof Plan (Rev A)
 - PL05 - Proposed Elevations (Rev A)
 - PL06 - Proposed Sections (Rev A)
 - PL07 - Proposed Lower Ground Floor Plan
 - PL11 - Proposed Site Sections (Rev A)
 - PL12 - Proposed Lower Ground Gabion Wall
 - PL15 - Proposed View 1
 - PL16 - Proposed View 2
 - PL17 - Proposed View 3
 - PL18 - Proposed View 4
 - PL20 - Proposed View 6
 - PL25 - Materials Board (rev A)
 - E97-00-01 Rev I3 - External Lighting Layout
 - 1363-13-05 soft landscape strategy plan
 - 1363-13-06A - hard landscape plan
 - 1363-13-07 boundary section
 - Soft landscape works - maintenance and management proposals
 - External lighting scheme strategy rev A (11/4/14)
 - Environmental Statement (April 2014)
 - Design and Access Statement (June 2014)
 - Lighting Strategy Report for spine road (rev A), April 2014
 - Environmental Statement Addendum (June 2014)
 - Further information relating to the Habitats Regulations Assessment (Annex A) and Environmental Impact Assessment (Annex B) (August 2014)
 - Documents and drawings as specified in Roberts Limbrick Technical Drawing Register & Issue dated 09.07.2014
 - Further information relating to the Habitats Regulations Assessment (Annex A) and Environmental Impact Assessment (Annex B) (August 2014)
 - Appendix B.3 Mitigation and Enhancement Schedules
 - Drawings and documents as listed in Roberts Limbrick Sheet S1.1 (9th July 2014)
 - Emails from the Forestry Commission (dated 15th & 17th September 2014) and accompanying plan (FEE plan MP-29(R)D HI2092014 (dated 12/09/2014)