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ECOLOGICAL CONSULTANTS
Limited Liability Partnership

Cowdale Quarry
Ecology Chapter Report

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Final

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INTRODUCTION

1.1 This chapter of the environmental statement has been prepared by Baker Shepherd Gillespie and examines the likely significant ecological effects of the proposed development within the site at Cowdale Quarry near Buxton. The ecological impact assessment has been carried out with reference to the guidance produced by the Institute of Ecology and Environmental Management (IEEM, 2006) which is recognised as current best practice.

1.2 The baseline ecology of the proposed development area is reviewed. Species and habitats are evaluated on a national and regional basis. Potential sources of ecological impact are outlined and predicted effects of the proposed development are described. The significance of these effects is evaluated and mitigation measures discussed. Any residual effects following mitigation are identified.

1.3 This chapter of the environmental statement is structured to follow the ecological impact assessment process from baseline data gathering to the assessment of residual impacts. It starts by describing the desk study and field survey carried out to gather data on flora and fauna, the habitats present on and around the site and any designated nature conservation sites in the area in order to establish the baseline conditions. This information is then evaluated to identify which receptors (i.e. sites, habitats and species) are of importance for nature conservation, placing that importance on a geographical scale from site to international level. The potential impacts on these receptors are then outlined and an assessment is made as to whether the effects of the impacts are likely to be ecologically significant. In the final stages, the potential for mitigation measures to reduce the level of any significant adverse impacts is investigated and the likely post-mitigation residual impacts are discussed.

PLANNING POLICY CONTEXT

1.4 This section sets out the policy and legislation context for the ecological assessment. A summary of the relevant policy and legislation is set out below at the international, national, regional and local levels:

National policy

Planning Policy Statement 9: biodiversity and geological conservation

1.5 Planning Policy Statement 9: Biodiversity and Geological Conservation (PPS9) [6.12] sets out the Government's national policies on the protection of biodiversity and needs to be taken into account by regional and local planning bodies.

1.6 PPS9 states that:

"*Planning decisions should aim to maintain, and enhance, restore or add to biodiversity interests. In taking decisions local planning authorities should ensure that appropriate weight is attached to designated sites of international, national and local importance; protected species; and to biodiversity interests within the wider environment*. "

"*The aim of planning decisions should be to prevent harm to biodiversity and geological conservation interests. Where granting planning permission would result in significant harm to those interests, local planning authorities will need to be satisfied that the development cannot reasonably be located on any alternative sites that would result in less or no harm. In the absence of any such alternatives, local planning authorities should ensure that, before planning permission is granted, adequate mitigation measures are put in place. Where a planning decision would result in significant harm to biodiversity and geological interests which cannot be prevented or adequately mitigated against, appropriate compensation measures should be sought. If that significant harm cannot be prevented, adequately mitigated against, or compensated for, then planning permission should be refused*."

Designated Sites

1.7 PPS9 states that designated sites are a material consideration in any planning decision related to the proposed development. Local Plans should develop criteria based policies within local plans against which development proposals affecting local sites can be judged. Guidance has subsequently been produced by Defra on the identification, selection and management of local sites.

Habitats

1.8 In Paragraph 12 of PPS9, the government indicates that local authorities "*should take steps to maintain networks of habitats by avoiding or repairing the fragmentation and isolation of natural habitats through policies in plans. Such networks should be protected from development, and where possible strengthened or integrated within it"*.

1.9 A range of habitat types are listed as a Habitats of Principal Importance under the provisions of Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006. Paragraph 11 of PPS9 states that local authorities, "*through policies in plans, should conserve important natural habitat types that are identified as being of principal importance for the conservation of biodiversity in England and identify opportunities to enhance and add to them*".

Protected Species

1.10 A range of species are listed as Species of Principal Importance for the conservation of biodiversity in England in response to Section 41 of the NERC Act. These species are a material consideration in planning terms according to Planning Policy Statement 9: Biodiversity and Geological Conservation (PPS9).

1.11 In paragraph 16 of PPS9, the government indicates

" that local authorities should take steps to further the conservation of Species of Principal Importance for the conservation of biodiversity in England and should ensure that that the habitats of these species are protected from further decline and from adverse effects of development, where appropriate, by using planning conditions or obligations. Planning authorities should refuse permission where harm to the species or their habitats would result unless the need for, and benefits of, the development clearly outweigh the harm.

1.12 Key Principle ii of PPS9 and Paragraph 116 of Government Circular 06/2005, which accompanies PPS 9, also advise that planning authorities should give due weight to the presence of a European Protected Species on a development site to meet their statutory requirements in exercising their functions in relation to the Habitats Directive.

Local policy

Local Development Framework: High Peak Saved Local Plan Policies

Conservation and Enhancement of the Open Environment

The Derbyshire Wildlife Sites Register, prepared by Derbyshire County Council and Derbyshire Wildlife trust, identifies natural history sites of more local significance. English Nature has produced an inventory of Ancient Woodlands in Derbyshire and concluded that high priority should be given to preventing further reductions in the area or nature conservation value of ancient woodland. These woodlands, which have existed under woodland management from before 1600AD afford excellent habitats for wildlife because of their unrivalled structure and shelter, as well as having a significant landscape presence. The best of the ancient woodlands have been incorporated in the Wildlife Sites Register. These sites and the Regionally Important Geological Sites reflect the High Peak's rich and diverse heritage of moorland, meadowland, woodland, bog and wetland. The Council will give protection from significant loss or adverse impact from development to such sites. However, if other material factors are sufficient to override nature conservation considerations, measures will be taken to minimise and mitigate impact on identified sites.

Policy 15

OC8 - SITES OF IMPORTANCE FOR NATURE CONSERVATION

Development which individually or cumulatively with other development may affect a proposed or designated Site of European Importance will be subject to rigorous examination and will only be permitted where:

- *there are no imperative reasons of over-riding public interest for the development such as human health or public safety or for beneficial consequences of primary importance for nature conservation.*
- *there is no alternative solution; and*

Development in or likely to affect Sites of Special Scientific Interest will be subject to special scrutiny and will only be permitted where:

- *measures are put in place to ensure the protection and enhancement of the site's nature conservation interest.*
- *the reasons for development clearly outweigh the nature conservation value of the site itself; and*

Development likely to have an adverse effect on Local Nature Reserves, a Derbyshire Wildlife Register site or a Regionally Important Geological Site will only be permitted where:

- *measures are in place to ensure appropriate mitigation and compensatory measures including the management of such provision*
- *it can be clearly demonstrated that there are reasons for the proposal that outweigh the need to safeguard the substantive nature conservation value of the site;*

Trees and Woodlands

The Council has published a leaflet entitled "Protection of Trees on Development Sites", the advice in which applicants will be encouraged to follow.

Policy 16

OC10 - TREES AND WOODLANDS

Planning Permission will be granted for development, provided that:

- *it will not result in the loss of, or materially injure the health of, a woodland (in whole or in part) or other significant individual, group or area of trees, unless required in the interests of safety, good tree management or a wider scheme of conservation and enhancement;*

or

- *exceptionally, where loss or injury is accepted, adequate replacement planting, in terms of numbers, species, planting density and location, will be provided as part of the development*

Conditions will be imposed, and/or planning obligations sought, to ensure adequate protection and management of individual, groups and areas of trees and woodlands which are important for landscape, amenity, recreation or nature conservation reasons.

Biodiversity Action Plans

1.13 The Government has drawn up a national strategy to conserve our threatened native species and habitats - the UK Biodiversity Action Plan. The UK Biodiversity Action Plan (BAP) includes a large number of detailed action plans for priority habitats and species.

1.14 The UK BAP is supported by a series of local Biodiversity Action Plans, usually set up on a county basis; each of which identifies those priority habitats and species considered to be most important in that area. The Lowland Derbyshire Biodiversity Action Plan (2001) identifies a number of habitats for which action plans have been prepared, such as semi-natural grasslands and broad leaved woodland. The Lowland Derbyshire Biodiversity Action Plan also identifies a number of Priority Species.

Habitats and Species of Principal Importance

1.15 Section 40 of the Natural Environment and Rural Communities (NERC) Act 2006 states that "*every public authority must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity*." Conserving biodiversity is identified to include restoring or enhancing a population or habitat.

1.16 Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006 requires a list to be prepared of those habitats and species of principal importance for the conservation of biological diversity in England. Under PPS9, local authorities should take measures to protect the habitats and species referred to by Section 41 from "*further decline through policies in local development documents"*. Planning authorities "*should ensure that these species are protected from the adverse effects of development, where appropriate, by using planning conditions or obligations*". They should also "*refuse permission where harm to the species or their habitats would result unless the need for, and benefits of, the development clearly outweigh that harm"*.

Wildlife Legislation

1.17 The Conservation of Habitats and Species Regulations 2010 and the Natural Environment and Rural Communities (NERC) Act 2006 are the most recent pieces of legislation providing protection to certain sites and species in the UK. There are several pieces of legislation that pre-date this Act which also provide varying degrees of protection to species and special sites in the UK: the Wildlife and Countryside Act (1981) (as amended), the Protection of Badgers Act (1992), the Abandonment of Animals Act (1960) and the Wild Mammals (Protection) Act (1996).

ESTABLISHING THE BASELINE

Desk Study

1.18 A desktop study was carried out to determine the presence of any protected or notable species records for a 2km radius around OS grid reference SK 079 723 and for statutory or non-statutory designated sites of nature conservation value (such as Sites of Special Scientific Interest (SSSIs), Special Area of Conservation (SAC) or Local Wildlife Sites (LWS), within a 5km radius of the site.

1.19 The Derbyshire Wildlife Trust was contacted to supply some of this information and Natural England's nature-on-the-map website[1] was consulted to determine the locality of statutory protected sites within 2km of the study site.

Consultation

1.20 A scoping report was sent to the High Peak Borough Council in January 2010 outlining the issues that would be considered within the Environmental Impact Assessment (EIA). This included Ecology.

1.21 Derbyshire Wildlife Trust responded to the Planning Application with a series of comments. Subsequently a meeting on site was arranged to discuss the approach to further survey work required to inform the Ecology Chapter of the EIA. Following the site meeting a letter was sent to Trevor Taylor of DWT setting out the proposed approach to the further survey work considered necessary to determine the likely impacts of the proposed development. A copy of the correspondence can be found in Appendix 4.

Field Survey

1.22 The survey methodology is summarised below.

Extended Phase 1 Habitat Survey

1.23 Principal Ecologist Philippa Harvey MIEEM and Senior Ecologist Mark Woods MIEEM visited the site on the 7th October 2009 between 0900 and 1530 hours. The weather was sunny with light winds and an average temperature of 16^0C.

1.24 The site was walked over and the habitats were described using an adapted version of the Phase 1 Habitat survey methodology[2], extended to check for signs of protected and other notable species.

1.25 Checks for signs of protected species were made across the site and, where access allowed, immediately adjacent to the site, and habitats were assessed for their potential to

[1] www.**natureonthemap**.org.uk/
[2] *JNCC*, 1993. Handbook for Phase 1 Habitat Survey, Peterborough.

support important/protected species. The trees and buildings/structures on site were assessed for their potential to support roosting bats, such as cracks, splits, woodpecker holes and dense ivy. Searches were also made for evidence of badgers *Meles meles* (such as setts, dung pits, hairs and tracks). Habitats were assessed for their potential to support reptiles. Potential nesting habitats for breeding birds were identified and the site was also searched for the presence of invasive species such as Japanese knotweed *Fallopia japonica.*

Botanical Survey

1.26 A further walkover survey of the site by Mark Woods and Philippa Harvey was undertaken in late March 2010 of the spoil heap vegetation to identify any early flowering plants that may be present.

1.27 Detailed botanical surveys of the Cowdale Local Wildlife Site and the northern edge of the quarry top (which is to be lost as part of the development) were carried out by Mark Woods and Philippa Harvey on the 5th June 2010.

1.28 A condition assessment of the ancient woodland within the development site using common standards monitoring survey techniques was undertaken by Mark Woods on the 26th January 2011.

Badger Survey

1.29 The badger surveys involved walking the site, recording any signs of badger activity such as snuffle holes, well-worn tracks or dung pits. The majority of the woodland on the north and east of the site is inaccessible by foot due to the steepness of the terrain. It was however possible to check the woodland edges for badger setts and signs of activity. However, the most westerly spoil heap to be removed could not be comprehensively surveyed and the presence of badger setts cannot be totally ruled particularly as there are well-worn badger paths along the top of the bank.

1.30 Surveys were undertaken by Principal Ecologist Philippa Harvey on the 25th March 2010. Additional notes on signs of badger activity were made during site visits for other survey work in April, May and June 2010.

Breeding Bird Survey

1.31 The survey methodology broadly followed the 'Common Bird Census' (CBC) devised by the British Trust for Ornithology (BTO). This technique records the location and movements of every bird present within a defined survey area, recording each individual only once.

1.32 Three visits were undertaken during the bird breeding season in suitable weather conditions between the hours of 8.00 am and 11.30 am, when birds are most active. Philippa

Harvey carried out the surveys. The dates and weather conditions during these surveys are detailed in Table 1 below. There were no constraints to the survey.

1.33 A transect route was walked around the survey area. Records were made of birds singing or calling, repeated territorial calls, territorial aggression, displaying, adults carrying food or nesting material, juvenile birds and family groups.

Table 1: Breeding bird survey dates and weather conditions

Date	Weather conditions
4th April 2010	Cold, overcast slight breeze 3^0C
14th May 2010	Cold, overcast 7^0C
18th June 2010	Clear, sunny, 24 ^{0}C

Bats

Roosting potential

1.34 The trees within the survey site were assessed during the Phase 1 Habitat Survey for their potential to support bat roosts. The built structures were assessed as part of the further survey work for their potential to support roosting bats. Trees and buildings were inspected from the ground, using binoculars where necessary, to assess their potential to support roosting bats and to make searches for evidence of the presence of bats, such as bat droppings, feeding remains and characteristic staining associated with any features such as gaps in stonework or rot holes within trees. The trees to be lost in association with the new access road were checked again during the botanical surveys of the woodland for their potential to support roosting bats.

Bat Transect Surveys

1.35 Philippa Harvey and Field Assistants Grant Brammall and Michelle Sullivan carried out three bat transect surveys in late May and June 2010. A Duet frequency division and an Eridol MP3 recording device were used during the transect survey. The heterodyne detector was used for immediate analysis of calls in the field and the Duet and Edirol recorder were used to record and confirm these calls following the survey. This type of survey involves a pre-determined route being walked with regular five minute station stops on route. Table 2 details the dates, time and weather conditions.

1.36 During the first evening activity survey it was not possible to walk around the foot of the quarry because of the presence of cows and newly born calves on the quarry floor. However, subsequent surveys were carried out along the quarry floor and bat activity recorded.

Table 2: Bat transect survey dates, times and weather conditions

Date	Time of survey	Weather conditions
25th May 2010	9.15 pm to 10.30 pm	Overcast with a breeze. 11°C.
23rd June 2010	9.30 pm to 23.05 pm	Dry and warm with partial cloud cover. 15°C.
28th June 2010	9.30 pm to 22.45 pm	Overcast, breezy, occasional light rain.

Reptile Survey

1.37 Twelve reptile mats were set out across the site in suitable habitat considered likely to be used by reptiles. Ideally more refugia would have been used; however this was not possible due to the steepness of the spoil mounds and quarry face and the high level of grazing stock present in the quarry. This is not considered to be a constraint to the surveys as it was possible to walk the site looking for basking reptiles.

1.38 Surveys were then carried out in April, May and June 2010. This survey work involved walking the site and using binoculars to search for reptiles in areas of suitable habitat. During the survey the mats were also checked to see if any reptiles were located underneath or basking on top of the mats. The dates and weather conditions of this survey work are detailed in Table 3 below.

Table 3: Reptile survey dates and weather conditions

Date	Weather conditions	Results
14th April 2010 (Putting out reptile mats)		N/A
26th April 2010	Intermittent sun, partial cloud, still. 15°C.	No reptiles.
14th May 2010	Cloudy, still, 7°C	No reptiles
19th May 2010	Cloudy, still, 7°C	No reptiles
26th May 2010	Overcast, 12°C	No reptiles
4th June 2010	Clear, sunny, 26°C	No reptiles
16th June 2010	Clear sunny, 23°C	No reptiles
18th June 2010	Clear sunny, 24°C	No reptiles

Invertebrate Survey

1.39 The south-facing slopes of the old spoil-heaps were considered to be a potentially valuable micro-habitat for invertebrates, in particular nesting bees and wasps. An entomological survey was undertaken in 2010 to assess the value of the site for invertebrates, focusing on the spoil-heaps.

1.40 The survey aimed:

- to assess the potential of the site for invertebrates by visual assessment of the habitats, taking digital photographs to support these observations, and
- to assess the quality of the site by sampling invertebrates.

1.41 The survey was conducted with regard to the guidance contained in Anon. (2005) and Drake et al. (2007). Entomological Consultant Dr Mark G. Telfer visited the site on the 26th and 27th May 2010. Invertebrates were recorded using a range of techniques (Table 4).

Table 4: Techniques employed on this survey to record invertebrates, and their target groups and target habitats.

Technique	Target groups	Target habitats
Yellow pan trapping.	Bees, wasps (aculeate *Hymenoptera*) and flies (*Diptera*).	Foci of bee and wasp activity such as nesting sites or flower-rich foraging patches.
Grubbing at ground level, turning over logs and stones, etc.	A wide range of ground-living invertebrates, particularly beetles (*Coleoptera*), bugs (*Heteroptera*), ants (*Hymenoptera*: *Formicidae*) woodlice (*Isopoda*) and molluscs.	All habitats, especially bare and sparsely-vegetated ground.
Suction sampling (also known as vacuum sampling).	As above but catching species which are too small, too well-camouflaged or too quick-running to be successfully captured by hand.	Grassland and ruderal vegetation.
Sieving.	A useful supplement to grubbing and suction sampling in denser vegetation. Handfuls of vegetation are sieved over a tray to reveal a range of beetles, bugs and other ground-living invertebrates.	Grassland and plant-litter especially.
Sweep-netting.	Solitary bees and wasps; beetles and bugs in grassland vegetation.	All vegetated habitats, paying particular attention to nectar and pollen sources.
Beating.	Beetles and bugs on the branches, flowers and foliage of shrubs and trees.	Shrubs and trees.
Direct observation.	Bees, wasps, flies, butterflies, grasshoppers and crickets (*Orthoptera*), etc.	All habitats, paying particular attention to nectar and pollen sources.

1.42 Where practical, invertebrates were identified in the field but wherever any doubt existed, one or more specimens were collected for more detailed scrutiny. To achieve

accurate identifications, specimens were identified using the surveyor's own library and entomological collections. Selected specimens have been retained in the surveyor's collection as vouchers.

1.43 The weather on 26th May was overcast with a Moderate Breeze (Force 4) and a predicted maximum temperature of 13 ºC. The day was dry except for a light shower at 16.30. The weather on 27th May was windier (Strong Breeze, Force 6) but warmer and with sunny intervals (7 eighths cloud cover). There were two brief light showers, at 10.00 and 11.15. Weather conditions were not ideal for survey of bees, wasps, butterflies and other sun-loving insects. However, the conditions were adequate for survey of other invertebrates.

Method of ecological evaluation

1.44 The assessment methodology for this chapter has been undertaken with regard to the "Guidelines for Ecological Impact Assessment" developed by the Institute of Ecology and Environmental Management (IEEM February 2006). The objective of the Guidelines is to promote a scientifically rigorous and transparent approach to Ecological Impact Assessment (EcIA), as a key component of EIA. The Guidelines comprise advice on best practice in four key areas of EcIA:

- Identifying and evaluating ecological features.
- Characterising and quantifying impacts and assessing their significance.
- Minimising adverse effects and maximising benefits through the scheme design process.

1.45 The IEEM Guidelines recognise that ecological evaluation is a 'complex and subjective process' but describes key considerations that should be taken into account when 'applying professional judgement to assign values to ecological features and resources'. These include consideration of: geographic frame of reference; site designations and features; biodiversity value; large populations or important assemblages of species; potential value, secondary or supporting value.

Evaluation methodology

1.46 In order to evaluate the importance of ecological features identified in the desk study and field surveys, a set of standard measures are outlined in the guidance produced by IEEM. For each site, habitat and species/assemblage, a summary grade is determined using the recommended levels of value in the guidance. This places the importance of each feature in a geographical context, using the following hierarchy:

- international

- UK
- national (England)
- regional (East Midlands)
- county (Derbyshire)
- district (High Peak Borough)
- local (or parish) (Buxton)
- site - within immediate zone of influence only (the development site and immediate surrounds).

1.47 Where possible, formal criteria are used to set features of conservation importance within this geographical context. For example, the Guidelines for the Selection of Biological SSSIs (Nature Conservancy Council, 1989) can be used to assess features at the national level. Similarly, published guidelines for the selection of SINCs are normally used to assess features at the county level.

1.48 However, this is not always possible and there are a number of other frameworks that can be used to help place designated sites, habitats or species into the geographical hierarchy. These include the following:

- International law – EU Birds and Habitats Directives.
- National law – Wildlife and Countryside Act 1981, Countryside and Rights of Way Act 2000, Natural Environment and Rural Communities Act 2006.
- UK Biodiversity Action Plan, Lowland Derbyshire Biodiversity Action Plan.
- Information on national population status, descriptions of "Natural Areas[3]", and local information on rarity Derbyshire Red Data Books.

By considering these factors and by using professional knowledge of species, habitats and the proposed development site, each ecological feature's importance in a geographical context has been determined.

Identification of impacts and ecological effects

1.49 In addition to evaluating the importance of the ecological features identified, this section determines the significance of predicted potential ecological impacts arising from the development proposals prior to any form of mitigation. It does so by assessing and characterising the anticipated impacts on each ecological feature in light of the available

[3] English Nature (now part of Natural England) developed the 'natural areas' approach to describe the locally distinctive wildlife characteristic of 92 areas throughout England. The site is within the White Peak Natural Area. The natural area profiles list key habitats for each area including calcicolous and neutral grassland and woodland

information. Professional judgement is used to determine whether the effects related to these are expected to be ecologically significant.

1.50 The predicted impacts may be direct or indirect in nature and may occur in one or more of the construction or operational phases of the scheme. The impacts identified in relation to each ecological feature are considered with reference to a number of factors as appropriate to each impact and each receptor:

- direction (positive, negative or neutral impact)
- magnitude (the amount or level of impact)
- extent (area in hectares, linear metres, etc)
- duration (in time or related to species life-cycles)
- reversibility (i.e. is the impact permanent or temporary)
- timing and frequency (e.g. related to breeding seasons)
- cumulative effects (between impacts from a number of sources)

1.51 These factors provide a means of characterising impacts on the features identified, thereby allowing significance to be assessed.

Determining Significance

1.52 IEEM guidance states that impacts should be determined as being significant when they have an adverse or positive effect "on the integrity of a defined site or ecosystem and/or the conservation status of habitats or species within a given geographical area". Such impacts may either be significant at the same level of importance as defined in the Evaluation section, or at a lesser geographical scale. For example, limited impacts on a site of County importance might be assessed as being significant at a District level of importance.

1.53 The integrity of a site or ecosystem is defined in Governmental guidance as "the coherence of its ecological structure and function, across its whole area, that enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was classified". This definition applies easily to designated sites, which normally have well-defined reasons for classification and conservation objectives (normally set out in a site 'citation'). However, for sites which have not been designated, the ecologically important characteristics of the area require ecological judgement and background information to provide the necessary context. In determining the significance of any potential impacts, a site can be regarded to have integrity (or 'favourable condition') when its ecological function remains whole, it continues to meet its conservation objectives and it retains the ability to recover from disturbance and to evolve in ways favourable to conservation with a minimum of external management support (European Commission, 2000).

1.54 The concept of 'conservation status' is also used to determine the significance of ecological impacts on a habitat or species. This is defined in IEEM guidance as below:

1.55 For habitats, conservation status is determined by the sum of the influences acting on the habitat and its typical species that may affect its long-term distribution, structure and functions as well as the long-term survival of its typical species within a given geographical area.

1.56 For species, conservation status is determined by the sum of influences acting on the species concerned that may affect the long-term distribution and abundance of its populations within a given geographical area.

1.57 Conservation status can be evaluated at a range of scales from local to international, in line with the evaluation of the resource. For some habitats or species, conservation status may be explicitly stated in documents such as Biodiversity Action Plans, but for others conservation status may have to be determined using other background information or local expertise.

1.58 The conservation status of a habitat or species can be seen as favourable when the following criteria are met:

- The area of habitat is stable or increasing.
- The structure and functions of the habitat necessary for its long-term maintenance continue to exist.
- The population of a species is maintaining itself on a long-term basis.
- The range of a species is stable.
- There is sufficient habitat to maintain the population.

1.59 Using this information a judgement is made as to whether the effects on the integrity (of site/ecosystems) or conservation status (of habitats/species) of each ecological feature will be significant. The impact significance is determined at the appropriate geographical scale.

1.60 Neutral impacts have no level of significance applied to them.

Confidence in significance assessment

1.61 A level of certainty is given to indicate the confidence placed in the assessment of the residual impact significance. The four-point scale identified above is used for this step.

BASELINE ECOLOGICAL DESCRIPTION

1.62 This section provides a summary of the ecological and nature conservation characteristics of the proposed development site. Full details of the results of the survey work and desk study are set out in the Phase 1 Habitat survey reports in Technical Appendix 1..

Desktop Study Results

Statutory and non-statutory sites of nature conservation value

Statutory Designated Sites

1.63 A number of statutory sites of nature conservation interest were located within 5km of the site, including the Peak District Dales Special Area of Conservation (SAC) and the Peak District Moors Specially Protected Area (SPA) and South Pennine Moors SAC. Wye Dales SSSI is located 0.4km to the north of the site at its nearest point (Cunning Dale), centred at OS grid reference SK 154 722. Other dales included within the Wye Dale SSSI such as Deep Dale and Woo Dale are located within 2km distance, to the west of the study site.

Non-statutory designated sites

1.64 Four Local Wildlife Sites: (LWS) and one "recorded site of interest" are located within 2km of the site. A LWS is identified as having county level importance for its nature conservation interest. A site of "recorded interest " is not a designated site.

- Cow Dale, which forms the eastern edge of the survey area, is an unimproved calcareous grassland site and is designated as a LWS (HP 176), covering an area of 8.64 Ha. Approximately half of this LWS (3.79 Ha) is identified as a semi-natural grassland.

- Ashwood Dale LWS (HP 027) to the north west of the survey site, and covers an area of 11.3Ha, supporting ancient semi-natural ash woodland. A small area of this LWS lies within the development site.

- Cunningdale North LWS (HP 158) is located approximately 1km to the north of the survey site at its nearest point, covering an area of 2.3Ha, supporting unimproved calcareous grassland.

- Cunningdale South LWS (HP 180) is located approximately 0.5km to the north of the survey site at its nearest point, covering an area of 3.1Ha, and supports unimproved neutral grassland.

- Cowdale Quarry, including the quarry rock face, cliff tops and the quarry floor within the survey area is identified as an "Other recorded site of interest" (DD 135). This is not a

formal designation but simply identifies that the site may be of ecological interest. The site was last surveyed in 2003.

1.65 In addition, Ashwood Dale and Ashwood Dale Quarry Regionally Important Geological Sites (RIGS) are located approximately 0.2km to the north of the survey site on the northern side of the A6.

Species

1.66 The Derbyshire Wildlife Trust provided the following records of protected species within 2km of the site (see Table 5 below). For full details refer to Appendix 1.

Table 5: Protected Species records

Common name	Latin name	Date	OS grid reference	Location	Distance from site
Pipistrelle	*Pipistrellus sp.*	1993	SK080725	Ashford Dale	0.2km north
Pipistrelle	*Pipistrellus sp.*	1998 and 2000	SK060722	White Knowle Rd, Buxton	1.9km west
Soprano pipistrelle	*Pipistrellus pygmaeus*	1999	SK071706	Harpur Hill, Buxton	1.8km southwest
Pipistrelle	*Pipistrellus sp.*	2005	SK065719	Somerset Close, Buxton	1.4km west
Common pipistrelle	*Pipistrellus pipistrellus*	2004	SK063717	Somerset Close	1.4km west
Water vole	*Arvicola terrestris*	1998	SK0872	River Wye	Within 1km
Water vole	*Arvicola terrestris*	1998	SK0872	River Wye	Within 1km
Great crested newt	*Triturus cristatus*	1976	SK087746	Buxton, green Lane	
Badger	*Meles meles*	1989	Confidential	Cowdale Quarry	Within the survey area
Badger	*Meles meles*	1994	Confidential	Cowdale Quarry	Within the survey area
Badger	*Meles meles*	2008	Confidential	Cowdale Quarry	Within the survey area
Badger	*Meles meles*	1994	Confidential	Cowdale Quarry Wood	Within the survey area

1.67 In summary, there is one record for great crested newts over 2km to the north east of Cowdale quarry and there are several records of bat activity in the local area. Water vole is recorded on the River Wye along the northern edge of the survey area. Twenty two records of badger setts have been provided with nine within 1km of the site. There are four records of setts within Cowdale Quarry dating back to 1989, with the most recent recording dating from 2008.

1.68 Three records for bird species of High Conservation Concern (Red List) were provided for the search area (See Table 6 below). None of the records are for the survey site, the nearest being from approximately 0.5km of the site.

Table 6: Birds of conservation concern records –red list and Derbyshire LBAP species, UK BAP species.

Species	Latin Name	Date of record	OS grid reference	Distance from site
Skylark	*Alauda arvensis*	1991	SK 077732	0.5 north
Starling	*Sturnus vulgaris*	1991	SK065723	1km west
Song thrush	*Turdus philomelos*	2001-2008	SK048734 SK067711 SK060722 SK064735 SK065731	1-3 km west

UKBAP Habitats/Species

1.69 The following records were provided for the local area. The reptile records relate to a Derbyshire Wildlife Trust reserve located 2km to the east of the site.

Table 7: UK BAP Priority Species

Common Name	Latin Name	Date	Grid Ref.	Distance from site
Brown hare	*Lepus europaeas*	2002	SK077734	0.5 north
Grass snake	*Natrix natrix*	1996	SK0971	2km east
Slow worm	*Anguila fragilis*	1996	SK0971	2km east

Derbyshire LBAP Habitats/Species

1.70 Three Nationally Scarce plant species (Derbyshire Red Data Book) Mountain currant *Ribes alpinum*, Pale St. John's-wort *Hypericum montanum* and Hutchinsia *Hornungia petraea*, are recorded within Cow Dale LWS (SK 0872). In addition, the Nationally Threatened plant species (Derbyshire Red Data Book) narrow-leaved bittercress *Cardamine impatiens* is recorded for Cow Dale. Clustered bellflower *Campanula glomerata* and saw-wort *Serratula tinctoria* recorded for Cowdale in 1996, this is a Locally Scarce or Declining plant.

Habitats

1.71 The locations of the habitats described below can be found on Figure 1, the Phase 1 Habitat Map. The Phase 1 Habitat Survey Report and Plan is located in Appendix 1. The Ancient Woodland Assessment Report is also located in Appendix 1.

Grasslands

Improved grasslands

1.72 The quarry floor (Target Note 21) supports improved grassland which is intensively managed and of low intrinsic ecological value dominated by perennial rye-grass *Lolium perenne*. Other species include white clover *Trifolium repens*, creeping buttercup *Ranunculus repens*, broadleaved dock *Rumex obtusifolius*, common nettle *Urtica dioica*, Yorkshire fog *Holcus lanatus*, creeping thistle *Cirsium arvense* and spear thistle *Cirsium vulgare*.

1.73 The grasslands surrounding the quarry on the south and west sides (Target Note 17) are also agriculturally improved, and species-poor with a very short sward. Grass species include abundant perennial rye-grass, with frequent cock's-foot *Dactylis glomerata*, common bent-grass *Agrostis capillaris* and red fescue *Festuca rubra*.

1.74 There are a number of both large and small spoil mounds along the north side of the quarry void (Target Notes 10, 20 and 23). They are flat-topped with steep-sided, actively eroding flanks. The plateaus of the spoil mounds support improved grassland which is grazed. Self-sown, immature shrubs and trees are also present on the spoil heaps.

Neutral Grassland

1.75 The fields to the east of the quarry are agriculturally semi-improved neutral grasslands (Target Note 1). The eastern edges of the fields sloping down to the woodland, and the grassland bordering the dry stone walls forming field boundaries where there is less agricultural improvement, support a wider variety of flowering herbs characteristic of unimproved neutral grasslands including meadow saxifrage *Saxifraga granulata*, pignut *Conopodium majus*, yarrow *Achillea millefolium*, lesser celandine *Ranunculus ficaria*, lady's-smock *Cardamine pratensis* and oxeye daisy *Leucanthemum vulgare*.

1.76 At the northeast corner of the site there is a small, grazed neutral grassland (Target Note 16) that supports a variety of grasses including frequent perennial rye-grass, red fescue, common bent-grass and cock's-foot. Herbs are sparse and include occasional creeping buttercup, common sorrel *Rumex acetosa* and creeping thistle. Common vetch *Vicia sativa*, common ragwort *Senecio jacobaea*, greater burnet *Sanguisorba officinalis* and lady's-smock are present but rare in the sward.

1.77 The northernmost edge of the quarry top supports a thin strip (4m x 50m) of unimproved neutral grassland which is rank and dominated by coarse grass species, hogweed *Heracleum spondylium* and raspberry *Rubus idaeus* sp.

1.78 Unimproved neutral grassland occupies a small triangle of land on the south boundary of the site (Target Note 14), above the quarry void. The grassland has a dense cover, near continuous thatch layer and is greater than 0.5m high. The stand consists of mesotrophic herbs and grasses such as common knapweed *Centaura nigra*, greater burnet, melancholy thistle *Cirsium heterophyllum*, creeping buttercup, cock's-foot, false oat-grass and meadow foxtail *Alopecurus pratensis*, but the presence of common nettle, hogweed and broadleaved dock suggests past disturbance and nutrient input.

Species-rich calcareous grassland

1.79 The quarry rock faces support a mixture of calcareous grassland, neutral grassland and tall-herb habitats on the ledges and less-steep slopes (Target Note 22). Trees and shrubs are more frequent at the foot of the rock faces and consist of immature native and

non-native species including ash *Fraxinus excelsior*, goat willow *Salix caprea* and sycamore *Acer pseudoplatanus*. Some areas of species-rich grassland are present on the rock faces. Species include red fescue *Festuca rubra*, sheep's fescue *Festuca ovina,* crested dog's-tail *Cynosaurus cristatus*, cock's-foot, rosebay willowherb *Chamerion angustifolium*, male fern *Triopteris felix-mas*, herb Robert *Geranium robertianum*, a hawkweed *Hieracium diaphanum*, common knapweed *Centurea nigra* and quaking grass *Brizia media*.

1.80 Calcareous grassland and scattered broadleaved trees are located above the quarry void and occupies a thin strip along the southern boundary of the quarry (Target Note 13). At its widest the strip of grassland is approximately 10m, narrowing down to 1.5m in places. The grassland is grazed in places and supports typical calcicole species such as red fescue, sheep's fescue *Festuca ovina*, rough hawkbit *Leontodon hispidus*, fairy flax *Linum catharticum*, yellow oat-grass *Trisetum flavescens*, carline thistle *Carlina vulgaris*, eyebright *Euphrasia officinalis* agg., downy oat-grass *Helictotrichon pubescens*, quaking grass *Brizia media* and glaucous sedge *Carex flacca*, but where soils are deeper the grassland supports more mesotrophic species such as white clover, cock's-foot, meadowsweet *Filipendula ulmaria* and hogweed. Shrubs and trees are occasional to locally frequent and consist of immature sycamore, ash, whitebeam *Sorbus aria* agg., rowan *Sorbus aucuparia*, hawthorn *Crataegus monogyna*, common osier *Salix viminalis* and grey willow *Salix cinerea* ssp. *oleifolia*.

1.81 The flanks of the spoil heaps support a sparse ephemeral calcareous grassland community. The grassland habitat on the flanks of the spoil tips is a rudimentary form of calcareous grassland, but unlike the typical limestone grasslands in the local area, it is relatively species-poor, with a very open structure. The basic components of Derbyshire limestone grasslands such as sheep's fescue *Festuca ovina*, glaucous sedge *Carex flacca* and common bent grass are present at fairly low density, but other typical indicator species such as wild thyme *Thymus polytrichus*, salad burnet *Sanguisorba minor*, common bird's-foot trefoil *Lotus corniculatus* and red clover *Trifolium pratense*, are absent. The improved grasslands on the tip plateaus are heavily grazed and botanically species-poor.

1.82 The east edge of the study site is defined by steep slopes with rocky outcrops that support a mix of unimproved neutral grassland, unimproved species-rich calcareous grassland with scattered and dense scrub (Target Note 5, 6 and 9). This area forms part of the Cow Dale Local Wildlife Site.

1.83 The calcareous grassland habitat on the slopes is dominated by greater knapweed *Centaurea scabiosa* with Yorkshire fog, quaking grass*,* melancholy thistle, salad burnet *Sanguisorba minor*, rough hawkbit *Leontodon hispidus*, ox-eye daisy, harebell *Campanula rotundifolia*, greater knapweed *Centurea scabiosa*, small scabious *Scabiosa columbaria*, and common valerian *Valeriana officinalis*. Meadow oat-grass *Helictotrichion pratense* and hairy

oat-grass *Helictotrichion oliptotirchon,* It is a typical example of a National Vegetation Community CG7 *Festuca-ovina-Hieracium pilosella – Thymus praecox/pulegioides* grassland which is characteristic of carboniferous limestone exposures of Derbyshire. A full species list for the Local Wildlife Site is presented in Appendix 2.

1.84 The calcareous grassland associated with the limestone outcrops supports a range of species including wall rue *Asplenium ruta muraria*, hawkweed *Hieracium* sp., quaking grass, maidenhair spleenwort *Asplenium trichomanes*, common rock-rose *Helianthemum nummularium*, harebell *Campanula rotundifolia*, mouse-eared hawkweed *Pilosella officinarum*.

Woodland

1.85 Secondary mature broadleaved woodland is located on the cliffs and rocky outcrops to the north of the quarry void, as well as on the spoil tips and flanking the A6 road. The woodland occupies a thin strip on steeply sloping ground that terminates in near vertical cliffs and rocky outcrops. A dense canopy of beech *Fagus sylvatica*, sycamore, common lime *Tilia x vulgaris* and Scots pine *Pinus sylvatica* has suppressed the shrub and understorey layers and the field layer is fairly sparse with patches of tufted hair-grass *Deschampsia cespitosa*, dog's mercury *Mercurialis perennis* and male fern *Dryopteris filix-mas*.

1.86 Because of the terrain much of the woodland is inaccessible and is, therefore, relatively undisturbed. The canopy supports sycamore and ash, with an understorey of wych elm *Ulmus glabra*, hazel *Corylus avellana* and hawthorn *Crataegus monogyna*. The field layer supports species such as tufted hair-grass, dog's mercury, common valerian *Valeriana officinalis*, wild angelica *Angelica sylvestris*, bramble *Rubus fruticosus*, wood avens *Geum urbanum* and water avens *Geum rivale*.

1.87 The majority of the secondary broadleaved woodland in the northeast corner of the Application Area is dominated by sycamore with ash, rowan *Sorbus acuparia* and beech *Fagus sylvatica* being common.

1.88 There is a small area (0.12ha) of ancient woodland in the northwest corner of the proposed development site adjacent to the A6 road. This forms part of the Ashwood Dale ancient woodland which in total amounts to 11.33 hectares and extends north, bordering the A6. This is dominated by ash with some wych elm and beech regeneration. The ground flora supports a number of species associated with ancient woodlands including wood anemone, bluebell and dog's mercury, particularly on the higher slopes.

1.89 In terms of the common standard monitoring features for the ancient woodland, the stand is considered to be in unfavourable condition. This is because undisturbed mature/old growth stands are absent and there is a general lack of fallen or standing deadwood within the sample plot. In addition, the cover of non-native trees is greater than 5%. The

herbaceous plants and bryophytes that are present on the slopes and ledges above the trunk road are all species which are generally associated with woodland habitat. However, the regular episodes of disturbance and changes to the composition of the canopy because of safety management may account for limited number of ancient woodland indicator plant species; only six of the 65+ species associated with ancient ash-woods[4] were recorded. Although ancient woodland indicator plants can tolerate regular episodes of disturbance such as coppicing and thinning, any tree / shrub clearance works that cause excessive disturbance of substrates can have an adverse effect on such plants (see Ancient Woodland Assessment Report in Appendix 1).

Other habitats- buildings

A number of disuses, collapsing buildings are located within the site associated with the quarrying and lime production. See Appendix 3 for descriptions and photographs.

Protected Species

Badgers

1.90 A main badger sett with seven active entrance holes with very well-worn paths leading between the entrances was located on the northern edge of the quarry spoil heap at OS grid reference SK 081 725 (see Figure 2, Appendix 4 Badger Activity Plan). Distinctive badger prints, bedding and badger hairs was located within the spoil mounds outside the entrances. A further three badger setts, each with a single entrance, were located at the top of the woodland edge on the northern edge of the development site (see Figure 2: Appendix 4: Badger Plan).

1.91 Signs of badger activity were located on the edge of the woodland bordering the most westerly spoil heap. Well-worn badger paths run along the dry stone wall forming the boundary of the woodland and within the woodland. A single entrance badger sett was located on the top of the north-western quarry edge bordering the woodland.

1.92 It is considered likely that there will be further badger setts within the woodland areas that were not subject to a comprehensive search given the difficulty of access due to the steep terrain.

1.93 No obvious badger tracks led into the open quarry area and there were no signs of foraging on the quarry floor. Evidence of digging was located on the spoil mound close to the sett which is likely to originate from feeding badgers. It is considered likely that badgers are mostly foraging in the extensive woodland areas fringing the north and east of the site.

[4] http://www.derbyshirebiodiversity.org.uk/news/files/Ancient_Woodland.pdf

Amphibians

1.94 No signs of amphibians were recorded on site during any of the surveys. No specific surveys to determine their presence or absence have been undertaken given the limited suitability of the site for amphibians. No ponds were identified.

Breeding Bird Surveys

1.95 A total of 22 bird species were recorded during the breeding bird survey. The breeding status of birds within the site is classified in three categories: confirmed, probable and possible breeders[5], and is shown in Table 8 below.

Confirmed breeding:

- Distraction display or injury feigning
- Used nests with eggshells found (occupied or laid within the survey period)
- Recently fledged young (nidicolous species) or downy young (nidifugous species)
- Adults entering or leaving nest site in circumstances indicating occupied nests or adults sitting on nest
- Adults carrying food for young or faecal sacs
- Nests containing eggs
- Nests seen with young or heard.

Probable breeding:

- Pairs observed in suitable nesting habitat in the breeding season
- Permanent territory presumed through registration or territorial behaviour (song etc.) on at least two different days, a week apart, at the same place.
- Display and courtship
- Visiting probable nest site
- Agitated behaviour or anxiety calls from adults
- Building nest or excavating in nest hole.

Possible breeding:

- Species observed in breeding season in possible nesting habitat
- Single male(s) present or breeding calls heard in breeding season.

1.96 Please note that the bird species denoted by an asterisk are birds that were recorded during other surveys (so their breeding status is not known).

[5] European Ornithology Atlas Committee, 1979. Categories of Breeding Bird Evidence.

Table 8: Bird species and breeding status

Species	Conservation Status[6]	UK BAP/Species of Principal Importance	Habitat Association	No. of Breeding territories	Breeding status
Kestrel *Falco tinnunculus*	Amber list - medium conservation concern -	✓	Quarry face	1	Po
Chaffinch *Fringilla coelebs*			Woodland	3	Pr
Blackbird *Turdus merula*			Woodland	3	Pr
Starling *Sturnus vulgaris*	- Red list - high conservation concern	✓	Grassland – feeding, woodland nesting	1	B
Pheasant *Phasianthus colchicus*	-		Woodland	1	Pr
Green woodpecker *Picus viridis*	-		Feeding on grassland, woodland	1	Pr
Great spotted woodpecker	-		Woodland	1	Pr
Song thrush *Turdus philomelos*	Red list - high conservation concern	✓	Feeding on grassland, woodland	1-2	Pr
Jackdaw *Corvus monedula*	-		Nesting on quarry face	4-5	B
Wren *Troglodytes troglodytes*	-		Woodland	3-4	Pr
Robin *Erithacus rubecula*	-		Woodland	3	Pr
Goldfinch *Carduelis carduelis*	-		Scattered trees, woodland	2	Pr
Dunnock *Prunella modularis*	Amber list - medium conservation concern -		Woodland	1	Pr
Chiffchaff *Phylloscopus collybita*	-		Woodland	2	Pr
Willow warbler *Phylloscopus trochilus*	Amber list - medium conservation concern -		Woodland	2	Pr
Blackcap *Sylvia atricapilla*	-		Woodland	3	Pr
Greenfinch *Carduelis chloris*	-		Garden	1	Pr
Great tit *Parus major*			Woodland	4	Pr
*Blue tit *Parus caeruleus*			Woodland	5-10	Pr

[6] Eaton et al 2009 Birds of Conservation Concern 3:the population status of birds in the UK, Channel Islands and Isle of Man. British Birds 102.

Long-tailed tit *Aegithalos caudatus*			Woodland	1	Pr
Swallow *Hirundo rustica*	Amber list - medium conservation concern -		Feeding over grassland	-	N
House martin *Delichon urbica*	Amber list - medium conservation concern -		Feeding over grassland	-	N

Site status: B= Confirmed breeding, Pr = Probable breeding, Po = Possible breeding, N = Not breeding

1.97 The majority of the birds recorded were present within the woodland fringing the eastern and northern edge of site. The quarry face supported several pairs of breeding jackdaw and possibly one pair of breeding kestrel.

Bats

Trees and quarry face

1.98 No signs of roosting bats were located during the walkover survey. The quarry face supports vertical rock faces with crevices and holes that may have potential to support roosting bats. No targeted surveys were undertaken of the quarry face (the quarry face is not to be affected by the development), although the bat activity surveys started at dusk and followed the base of quarry face in order to pick up any emerging bats.

1.99 Given their size and maturity, the woodland trees are largely unsuitable for roosting bats, although there are cliffs and rocky outcrops with crevices and holes set within the woodland also with some potential to support roosting bats.

Buildings/Structures

1.100 There are a range of structures on site associated with the former quarrying industry and lime production. These buildings have been assessed as having low potential to support roosting bats with no suitable features present (see Appendix 3 for details).

Habitats

1.101 The woodland edge along the northern edge of the site and the scattered trees around the spoil heaps and at the base of the quarry face provide a range of foraging and commuting opportunities for bats.

Evening Activity Bat Surveys

1.102 During the May 2010 transect survey common pipistrelle *Pipistrellus pipistrellus* bats were recorded. They were associated mainly with the woodland edge to the north of the quarry and with the semi-mature trees on the spoil heaps.

1.103 During the June transects common pipistrelle bats were recorded foraging along the quarry face, particularly where trees are present on the quarry top and at the foot of the cliff in the western end of the quarry. In addition, they were recorded feeding around the spoil heaps with scattered sycamore.

1.104 Figure 3 in Appendix 4 illustrates all the bat activity recorded. Tables 9a, b and c list the number of bat passes during the three activity surveys.

Table 9a: Bat passes recorded on25th May 2010.

Date	Time	Species	Number of bat passes
23/05/2010	21:50	Ppip	1
23/05/2010	21:55	Ppip	1
23/05/2010	22:00	Ppip	1
23/05/2010	22:05	Ppip	1
23/05/2010	22:10	Ppip	2

Table 9b: Bat passes recorded on 24th June 2010.

Date	Time	Species	Number of bat passes
24/06/10	22:10	Ppip	2
24/06/10	22.20	Ppip	2
24/06/10	22.25	Ppip	1
24/06/10	22:26	Ppip	1
24/06/10	22:28	Ppip	1
24/06/10	22:30	Ppip	1
24/06/10	22:55	Ppip	1

Table 9c: Bat passes recorded on 28th June 2010.

Date	Time	Label	Number of bat passes
28/06/10	22:02	Ppip	1
28/06/10	22:05	Ppip	2
28/06/10	22:07	Ppip	1
28/06/10	22:10	Ppip	1
28/06/10	22.11	Ppip	2
28/06/10	22.13	Ppip	1
28/06/10	22.15	Ppip	1
28/06/10	22.22	Ppip	1
28/06/10	22.25	Ppip	1

Key to Species in Tables 11a-c:
Ppip = Common Pipistrelle

Invertebrate Survey

1.105 The survey identified 135 species of invertebrate including representatives of the following groups: woodlice, harvestmen, millipedes, earwigs, grasshoppers, bugs, beetles, ants, bees, flies, butterflies, moths, slugs and snails. Aside from effort dedicated to finding

bees and wasps, there was a concentration of effort on beetles with 70 species recorded, 52% of the total species list.

1.106 A system of conservation statuses has been in use since the British Red Data Book for insects (Shirt, 1987), amended and supplemented by a series of JNCC Nature Conservation reviews. By this system, the rarest and most threatened species are given one of the Red Data Book (RDB) statuses. Species which do not qualify as RDB but are nonetheless uncommon are given one of the Nationally Scarce statuses.

1.107 Amongst the 135 species recorded by this survey, three (2.2%) have a Nationally Scarce conservation status but no Red Data Book species were recorded (Table 10). These scarce species are discussed further below.

Table 10: The 'Key Species' recorded by this survey. The table is ordered by Conservation Status (most important first)

Scientific name	English name	Conservation Status	Location on site
Ceutorhynchus pectoralis	a weevil	Nationally Scarce (Na)	Semi-improved grassland
Glocianus punctiger	a weevil	Nationally Scarce (Nb)	Semi-improved grassland
Beris clavipes	Scarce Orange Legionnaire	Nationally Scarce	Wanderer – usually associated with wetland habitats

1.108 Two of the three scarce insects found by this survey (*Ceutorhynchus pectoralis* and *Glocianus punctiger*) were collected from the semi-improved pasture at the eastern edge of the survey area which will not be adversely affected directly by the development.

Ceutorhynchus pectoralis (Coleoptera: Curculionidae) a weevil, Nationally Scarce (Na)

1.109 This weevil feeds on *Cardamine* species, the larvae developing in stem-galls. In Britain the weevil has been mainly recorded from large bitter-cress *Cardamine amara* in marshy places, at stream-sides, and in lightly shaded woodland (Morris, 2008). It has been described as “an obscure and poorly understood species” by Morris (2008). It is widely but very patchily distributed in England and southern Scotland northwards to Edinburgh but not recorded from Wales.

1.110 On the current survey, a single male was recorded by suction sampling in the semi-improved pasture on 27th May where it was probably associated with cuckoo flower.

Glocianus punctiger (Coleoptera: Curculionidae) a weevil, Nationally Scarce (Nb)

1.111 This weevil feeds on dandelions, mainly the Section *Ruderalia* which is by far the commonest Section of this large genus, and mostly includes micro-species which are weeds of lowland areas. Although the host plants are widespread and abundant, the weevil is much more restricted, typically being found in grasslands, waste places, at the sides of roads and tracks, in woods and in open and rough ground generally (Morris, 2008). It occurs very locally throughout England and Wales.

1.112 On the current survey, a single female was recorded by suction sampling in the semi-improved pasture on 27th May 2010.

Beris clavipes (Diptera: Stratiomyidae) Scarce Orange Legionnaire, Nationally Scarce

1.113 A medium-sized (6 - 6.5 mm) soldier-fly with an orange abdomen and smoky wing membranes. This species is widely distributed across England and lowland Wales, though with few records from northern England, and with isolated records in Scotland in Dumfriesshire and around Glasgow (Stubbs and Drake, 2001). It is thought to prefer wetland habitat, especially lush fens, though it is an elusive species about which ecological information is scant.

1.114 On the current survey, a single male fly was beaten from tree foliage on the top of the spoil-heaps on 27th May, where many flies were sheltering in dull conditions. In view of the apparent association of this species with wetland habitat, it may be best to regard this specimen as a wanderer.

Reptile Surveys

1.115 No reptiles were recorded during the surveys.

ASSESSMENT OF EFFECTS

General

1.116 This section of the document presents an evaluation of each key receptor and then reviews the development proposals and discusses the likely impacts and effects which could arise from these. These are then related to the potential ecological receptors (designated sites, habitats and species) identified in the baseline surveys to determine the potential interactions between the two. A structured review of the significant ecological impacts arising from these activities is then provided. A comprehensive Masterplan for the whole of the Cowdale Quarry site has been produced. The Application Area comprises approximately 8 hectares of land within the former quarry, which is now used for grazing livestock. Much of the quarry floor is flat but the northern section is occupied by large spoil mounds.

The development will involve development of a new water bottling plant and associated storage areas in the western half of the quarry floor area, with a new access off the A6, entering the site from the north west, internal roads and a small Heritage Centre in the south east corner of the quarry floor.

1.117 To facilitate the creation of the new access road approximately a fifth of the spoil mounds will be removed and approximately 6200m^2 of broadleaved woodland will be lost. The quarry floor will support the bottling plant, Heritage Centre and road infrastructure and this will result in the loss of the improved grassland habitat. The buildings will, however, be set back from the quarry face. The agricultural fields to the east and south of the quarry will be retained as will the Cow Dale Local Wildlife Site and the broadleaved woodland fringing the northern and eastern sides of the site.

1.118 The assessment of impacts is carried out in stages; the first in the absence of mitigation and then the residual impacts are set out, with the mitigation, compensation and enhancement taken into account.

Effects during the construction phase

Designated sites

Statutory designated sites

Evaluation and conservation objectives

1.119 A number of statutory sites of nature conservation interest were located within 5km of the site, including the Peak District Dales Special Area of Conservation (SAC) and the Peak District Moors Specially Protected Area (SPA) and South Pennine Moors SAC.

1.120 The Peak District Dales SAC is located 0.4km to the north of the site at its nearest point (Cunning Dale). Other dales included within the SAC site include Deep Dale and Woo Dale which are located within 2km distance, to the west of the study site. This site is also designated as a SSSI (Wye Valley). The Peak District Dales SAC site is considered to be of **International** value for its ecological and interest.

Requirements of the Habitats Directive

1.121 The Conservation of Habitats and Species Regulations 2010 makes provision for implementing the EC Directive on the Conservation of Natural Habitats and Wild Fauna and Flora in Great Britain. They detail measures relating to the conservation of Special Areas of Conservation (SACs) and Special Protection Areas (SPAs). These sites are known as European sites and form a European network known as Natura 2000. The Natura 2000 series of sites contains habitats and species which are rare, endangered or vulnerable in the European Community (in this report, these are referred to as European features). ():

1.122 Under Regulation 61, a competent authority, before deciding to undertake, or give any consent, permission or other authorisation for, a plan or project which

(a) is likely to have a significant effect on a European site in Great Britain (either alone or in combination with other plans or projects), and

(b) is not directly connected with or necessary to the management of the site,

shall make an appropriate assessment of the implications for the site in view of that site's conservation objectives.

1.123 Regulation 61 (2) requires that ‘a person applying for any such consent, permission or other authorisation shall provide such information as the competent authority may reasonably require for the purposes of the assessment.’

Ecological effects

1.124 There is no surface runoff from the site and all incident rainfall recharges the underlying limestone. Paragraphs 1.133-1.137 below are taken directly from the Hydrological Report prepared by Professor John Gunn.

1.125 The quarry is situated in the catchment for Rockhead Spring (see Section 3.2 below) which was recognised as a Natural Mineral Water in 2000. It is planned that water from Rockhead Spring will be bottled in the factory. Hence, protection of groundwater quality is of paramount importance to the developer as any contamination of the spring water, particularly by hydrocarbons, would have very serious consequences. The water from Rockhead Spring is currently piped to the Staden Industrial Estate for bottling. It is proposed to take a spur from this line into the new bottling plant in the quarry. No impacts on groundwater are foreseen.

1.126 As part of the present Abstraction Licence for Rockhead Spring it is necessary for the abstractor to provide compensation water to the River Wye when the discharge of the river (and that of rivers to which it is a downstream tributary) falls below certain threshold levels. Currently the compensation water is provided by a borehole some 1.6km from the river but subject to agreement from the Environment Agency it is proposed that some compensation water will be provided from the development area.

1.127 It is proposed that clean water from roofs will be channelled to storage lagoons on site and that 6000 cubic metres of water will be stored during the winter for use as compensation water if required later in the year.

1.128 Once the storage lagoons have reached 6000 cubic metres any additional clean water from roofs will be directed to a soakaway or soakaways. As part of the design process a water tracing experiment will be undertaken from each soakaway to establish the direction and speed of groundwater movement.

1.129 No water from roads and vehicle parking areas will be allowed to infiltrate or be sent to soakaways to avoid any possibility of groundwater pollution. All such water will be passed through interceptors and discharged directly to the River Wye at an agreed rate.

1.130 It is not anticipated that there will be any direct or indirect impact upon the aquatic or terrestrial habitats of the SAC site which is separated from the development site by the A6 and the River Wye. The development will not lead to an increase in polluted surface water run-off, any impacts on the groundwater or a lead to a significant rise in the level of air pollution, two of the key threats to the integrity of the SAC site.

Impact significance

1.131 The proposed works will not adversely affect (directly or indirectly) any statutory designated nature conservation sites including the nearest, the Peak District Dales Special Area of Conservation (SAC) which is also designated as the Wye Valley Site of Special Scientific Interest (SSSI). The impact of the development on designated sites will therefore be **neutral.** There is **high** confidence in this assessment.

Non-statutory designated sites

Evaluation and conservation objectives

1.132 There are four Local Wildlife Sites: (LWS) within 2km of the site. Cow Dale LWS forms the eastern edge of the survey area and is an unimproved calcareous grassland site covering an area of 8.64 hectares (see paragraph 1.91 for description). Ashwood Dale LWS is located immediately to the north west of the survey site, and covers an area of 11.33 hectares, supporting ancient semi-natural ash woodland.

1.133 Cunningdale North LWS is located approximately 1km to the north of the survey site at its nearest point, covering an area of 2.3Ha, supporting unimproved calcareous grassland. Cunningdale South LWS is located approximately 0.5km to the north of the survey site at its nearest point, covering an area of 3.1Ha, and supports unimproved neutral grassland.

1.134 A LWS is identified as having **county** level importance for its nature conservation interest.

Ecological effects

1.135 1200 m^2 (0.12 ha) of the southern edge of the Ashwood Dale ancient woodland within the proposed application site will be subject to a permanent loss where the new access road from the A6 is to be constructed. A further 695 m^2 (0.0695 ha) will need to be managed to maintain the site lines for the access road. The section to be lost is the southernmost edge of the LWS which is located on the rock face above the lay by and on the adjacent steep bank side within the site.

Impact significance

1.136 The area of woodland to be lost borders the A6 and does not support the characteristic ash woodland species and mature ecologically valuable trees usually associated with ancient woodland of this type. The ground flora of this area of ancient woodland is relatively species-poor, it does not support many of the characteristic ancient woodland indicator species which could be expected to occur in a more typical and undisturbed example of this habitat type. Only a very small area of the total woodland (circa 1%) will be affected. Due to the small amount of the site being lost, the fact that this area is on the southern edge of the LWS and the site will not be fragmented, it is considered that the

loss of this small area of the LWS is unlikely to affect the overall integrity of the LWS. Although the LWS is assessed to be of county value it is unlikely to give rise to an impact of county significance and is likely to only be significant at most at a **district** level. There is **high** confidence in this assessment.

1.137 There will be no direct or indirect impacts on any other non-statutory site of nature conservation interest.

Habitats

Ancient woodland

Evaluation and conservation objectives

1.138 The proposed route of the new access route from the A6 crosses a small area on the southern edge of the Ashwood Dale ancient woodland located on the steep bank bordering the southern edge of the A6.

1.139 Lowland Mixed Deciduous Woodland is a Priority Habitat within the UK and Lowland Derbyshire Biodiversity Action Plan (BAP). In addition, lowland mixed deciduous woodland (which includes ancient woodland) is a Habitat of Principal Importance.

1.140 The UK BAP Priority Habitat description states that "*there is no precise data on the total extent of lowland mixed deciduous woodland in the UK, but in the late 1980s the Nature Conservancy Council estimated the total extent of this type to be about 250,000ha. There is however no doubt that the area of this priority type on ancient woodland sites has declined in area by clearance, overgrazing and replanting with non-native species, by about 30-40% over the last 50 years*"[7].

1.141 The stand of ancient woodland to be affected by the development is considered to be in unfavourable condition (see Appendix 1 for the completed condition assessment recording form within report). This is because undisturbed mature/old growth stands are absent and there is a general lack of fallen or standing deadwood within the sample plot. In addition, the cover of non-native trees is greater than 5%.The herbaceous plants and bryophytes that are present on the slopes and ledges above the trunk road are all generally associated with woodland habitat. However, the regular episodes of disturbance and changes to the composition of the canopy because of safety management may account for limited number of ancient woodland indicator plant species; only six of the 65+ species associated with ancient ash-woods were recorded.

1.142 The ancient woodland as a whole is assessed to be of **county** ecological importance.

[7] UK BAP Priority Habitat Descriptions: Lowland Mixed Deciduous Woodland

Ecological effects

1200 m^2 (0.12 ha) of the southern edge of the Ashwood Dale ancient woodland within the proposed application site will be subject to a permanent loss where the new access road from the A6 is to be constructed. A further 695 m^2 (0.0695 ha) will need to be managed to maintain the site lines for the access road. This would entail the coppicing of the trees to ensure the site lines are clear. However, the trees within 450 m^2 of this area have recently been coppiced by Derbyshire County Council, thus reducing the area that would initially require clearance to 265 m^2 (0.0265 ha).

Impact significance

The area of woodland to be lost borders the A6 and does not support the characteristic ash woodland species and mature ecologically valuable trees usually associated with ancient woodland of this type. The ground flora of this area of ancient woodland is relatively species-poor, it does not support many of the characteristic ancient woodland indicator species which could be expected to occur in a more typical and undisturbed example of this habitat type. Only a very small area of the total woodland (circa 1%) will be affected. Because the loss of this small area on the southern edge of the ancient woodland is unlikely to affect the overall integrity of the block of ancient woodland which is assessed to be of county value, it is likely to be significant at most at **district** level. There is **high** confidence in this assessment.

<u>Broadleaved Secondary Woodland</u>

Evaluation and conservation objectives

1.143 The proposed new access road from the A6 will involve the loss of secondary broadleaved woodland that has developed on the steep bank of fill spoil beneath the exposed cliff located in the north-eastern part of the site.

1.144 Lowland Mixed Deciduous Woodland is a Priority Habitat within the UK and Lowland Derbyshire Biodiversity Action Plan (BAP). In addition, lowland mixed deciduous woodland is a Habitat of Principal Importance.

1.145 The secondary woodland is dominated by sycamore with ash, rowan and beech being common. The woodland ground flora plants generally associated with well-established and ancient woodlands are poorly represented. This habitat is widespread across the UK with an

estimated 250,000 hectares in 1980[8]. This secondary woodland is assessed to be of some **local** ecological importance.

Ecological effects

1.146 Approximately 7.5% (5000m^2, 0.5 ha) of the secondary broadleaved woodland (which is in total across the whole site 66,140 m2 or 6.64 ha) will be lost to allow for the new access road from the A6 to be constructed.

Impact significance

1.147 The woodland area requiring removal is semi-mature and dominated by semi-mature sycamore with some ash, beech and willow. The ground flora is sparse. The impact arising from the loss of the area of secondary woodland is considered likely to be significant at a **local** level. There is **high** confidence in this assessment.

Species-rich calcareous grassland

Evaluation and conservation objectives

1.148 Calcareous grassland occurs on the quarry top and rock faces of the quarry and also within Cow Dale LWS to the east of the proposed development site. The grasslands are species-rich and support melancholy thistle, a Derbyshire Red Data Book plant[9] and there are historical records of several locally scarce or declining plants. , It is a typical example of a National Vegetation Community CG7 *Festuca-ovina-Hieracium pilosella – Thymus praecox/pulegioides* grassland which is characteristic of carboniferous limestone exposures of Derbyshire.

1.149 Lowland calcareous grasslands are UK BAP Priority Habitats and Section 41 Habitats of Principal Importance. In addition, lowland calcareous grasslands are a Lowland Derbyshire Priority Habitat which has a Habitat Action Plan prepared. The species-rich calcareous grasslands within the site are assessed as being of **county** ecological importance as they are considered to be good examples of calcareous grassland typical of lowland Derbyshire and support a Derbyshire Red data book species and other scarce plants.

Ecological effects

1.150 There will be a no loss of species-rich calcareous grassland or any indirect effects from the development. The Cow Dale LWS species-rich grassland area will not be adversely affected by the proposed development.

[8] BRIG (ed. Ant Maddock) 2008. UK BAP Priority Habitat Descriptions : Lowland Mixed deciduous Woodland
[9] Flora of Derbyshire website. http://www.derby.gov.uk/dccwebdev/museum/flora/Flora.asp

Impact significance

1.151 The impact of the development on lowland calcareous grassland will therefore be **neutral**. There is **high** confidence in this assessment.

Semi-improved neutral grassland

Evaluation and conservation objectives

1.152 The fields to the east of the quarry are agriculturally improved, neutral grasslands. The eastern edges of the fields sloping down to the woodland and the grassland bordering the dry stone walls forming field boundaries where there is less agricultural improvement support a wider variety of flowering herbs characteristic of unimproved neutral grasslands including meadow saxifrage *Saxifraga granulata*, pignut *Conopodium majus*, yarrow *Achillea millefolium*, lesser celandine *Ranunculus ficaria*, lady's-smock *Cardamine pratensis* and ox-eye daisy.

1.153 Lowland meadows (which include neutral grassland) grasslands are UK BAP Priority Habitats and Section 41 Habitats of Principal Importance.

1.154 In addition, lowland meadows are a Lowland Derbyshire Priority Habitat which has a Habitat Action Plan prepared. Two of the three scarce invertebrate species recorded in 2010 were located within this pasture on the more herb-rich sward occupying the sloping easternmost part of the field. The semi-improved neutral grasslands are currently assessed as being of **local** ecological importance. There is **high** confidence in this assessment.

Ecological effects

1.155 There will be a no loss of the semi-improved neutral grassland fields to the east of the quarry. The fields will be retained and will not be adversely affected by the proposed development.

Impact significance

1.156 The impact of the development on lowland calcareous grassland will be **neutral**. There is **high** confidence in this assessment.

Ephemeral grassland on spoil mounds

Evaluation and conservation objectives

1.157 The steeply sloping flanks of the spoil mounds support a sparse ephemeral calcareous grassland community. This grassland habitat is a rudimentary form of calcareous

grassland, but unlike the typical limestone grasslands in the local area, it is relatively species-poor, with a very open structure within a mosaic with bare ground.

1.158 Lowland Calcareous Grassland and Open Mosaic Habitats on Previously Developed Land are both UK BAP10 (Biodiversity Action Plan) Priority Habitats and are listed as Habitats of Principal Importance under the provisions of Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006 (updated 2008).

1.159 It is considered that the grassland habitats located on the sides and tops of the spoil tips are of relatively low botanical value. This is because the survey did not locate any county or nationally rare, or scarce plant species; all of the species located are common-place elsewhere within the study site and the surrounding countryside, and the botanical community is species-poor. The ephemeral grasslands are therefore assessed as being of **local** ecological importance.

Ecological effects

1.160 The most westerly two spoil heaps will be removed to allow for the development of the access road. The remaining two small and the two large spoil heaps to the east of the proposed access road will be retained. The loss amounts to 11,500 m^2 of which approximately 6500m^2 supports ephemeral grassland. All the spoil heaps amount to approximately 50,000 m^2 in total. Therefore the loss equates to a loss of 23% of the receptor.

Impact significance

1.161 It is considered that, without mitigation or compensation, the removal of approximately a quarter of the spoil tip vegetation as a consequence of the proposed development will have an adverse impact, which is likely to be significant at a **site** level. There is **high** confidence in this assessment.

Improved grassland habitat

Evaluation and conservation objectives

1.162 The improved grassland occupying the quarry floor is considered to be of low ecological interest. The survey work has not highlighted any nationally or locally rare species of particular interest and the species recorded are considered to be widespread. These grasslands are common and widespread in the British Isles and locally, are not of significant conservation value and are therefore assessed to be of **site** interest only.

[10] www.ukbap.org.uk/newprioritylist

Ecological effects

1.163 The proposed development will involve the permanent loss of the improved grassland habitat of some 8 hectares, occupying the quarry floor and the improved grassland on the spoil heap plateaus.

Impact significance

1.164 Overall, the impact arising from the loss of this improved grassland habitat is considered likely have an adverse, significant at the **site** level. There is **high** confidence in this assessment.

Protected Species

Birds

Evaluation and conservation objectives

1.165 All nesting birds are protected under the Wildlife and Countryside Act 1981, which makes it an offence to intentionally kill, injure or take any wild bird or take, damage or destroy its nest whilst in use or being built, or take or destroy its eggs. In addition to this, for some rarer species (listed on Schedule 1 of the Act), it is an offence to intentionally or recklessly disturb them while they are nest building or at or near a nest with eggs or young, or to disturb the dependent young of such a bird.

1.166 The Birds of Conservation Concern (BOCC) listing assesses bird species on the basis of their population status, reflecting changes in their abundance and range.

1.167 Of the species recorded on site, two are on the BOCC Red List and are species of high conservation concern (song thrush and starling) and are breeding within the woodland to the eastern side of the site. Five species (kestrel, house martin, swallow, dunnock and willow warbler) are listed as species of medium conservation concern on the Amber List. Of the amber list species dunnock and willow warbler has been identified as being probably breeding on site within the woodland areas. House martin and swallow were recorded feeding over the eastern semi-improved neutral grassland areas. A pair of kestrels was located in the quarry in the last survey and during the evening bat surveys indicating that they could be breeding or roosting in the quarry.

1.168 The red list species listed above are also UK BAP Priority Species and are listed as Species of Principal Importance under Section 41 of the NERC Act and are therefore a material consideration in planning terms.

1.169 The majority of the birds recorded are common and widespread in the British Isles and locally, however the woodland habitats support a range of woodland birds including

several species of high and medium conservation concern and the bird assemblage is considered to be of **local** interest.

Ecological effects

1.170 The principal habitats being used for breeding purposes are the woodlands around the eastern and northern edges of the site. The majority of the woodland is to be retained within the development. There will be a small loss of 6200 m2 of secondary woodland in association with the creation of access road. Several common woodland bird species were recorded within this woodland area (including blue tit, chaffinch, wren, robin, great tit) The grassland habitats providing a feeding resource for swallow and house martin will be unaffected by the development.

Impact significance

1.171 The development is likely to give rise to an impact on birds through a reduction in the overall potential nesting and foraging resource within the site. The principal habitats to be lost are the quarry floor grasslands, the northwest edge of the quarry top, two of the five spoil heaps, scattered semi-mature trees, and an area of secondary broadleaved woodland and ancient woodland. Birds use the woodland and trees for nesting purposes. No ground nesting birds were located on the open grassland areas of the quarry floor and therefore no impact on nesting birds is anticipated in association with this habitat.

1.172 In addition, if work which affects habitats suitable for nesting birds is carried out during the nesting season (generally March to August) then an impact on nesting birds is possible. This would amount to an offence under the Wildlife & Countryside Act.

1.173 The impact on nesting birds arising from the loss of a small area of secondary broadleaved woodland is considered likely to be significant at a **site** level. There is **moderate** confidence in this assessment.

<u>Badgers</u>

Evaluation and conservation objectives

1.174 Badgers are protected under the Protection of Badgers Act 1992 (the Badger Act). This makes it an offence to wilfully kill, injure, take, possess or cruelly ill-treat a badger, or to attempt to do so; or to intentionally or recklessly interfere with a sett. Sett interference includes disturbing badgers whilst they are occupying a sett, as well as damaging or destroying a sett or obstructing access to it".

1.175 The site supports an active main badger sett and several single-entrance outlier setts, all located along the northern part of the site within the steeply sloping woodland. In addition, there is a further outlier on top of the quarry ridge in the north-west corner. It is considered

likely that one social group of badgers is occupying these setts. There are a number of well-worn badger paths running through the woodland, connecting the sett entrances and there are signs of foraging within the woodland and the grasslands of Cow Dale LWS.

1.176 Badgers are widespread and common throughout most of Britain and are protected for reasons of welfare rather than conservation. The badger use of the site is therefore considered to be of ecological value in a **Local** context.

Ecological effects

1.177 The main badger sett is located on the edge of the woodland approximately 100 metres from the proposed new access road. A further single-entrance sett is located within the woodland to the north of the most easterly spoil heap, approximately 300m from the proposed new road location. The third sett, a single-entrance sett, is located close to the main sett within the woodland.

1.178 Because the main sett is approximately 100m from the development footprint, and if the recent NE guidance on what is likely to constitute disturbance is applied then, disturbance is unlikely to arise. There will be no direct/indirect impact on these three badger setts.

1.179 However, there is a further single sett entrance on the top of the quarry face in the north-west part of the site. Due to the engineering works associated with the creation of the new access road, there is likely to be a high level of disturbance to badgers occupying this sett. Temporary closure under a development licence is recommended in the mitigation section below.

Impact significance

1.180 The Badgers Act 1992 defines a badger sett as “any structure or place which displays signs indicating current use by a badger” and makes it an offence, amongst other things, to disturb a badger when it is occupying a sett. However, what constitutes “disturbance” to badgers occupying a sett have been the subject of debate and can be interpreted in different ways.

1.181 Natural England (NE), the Government statutory advisorary body on Nature Conservation, has issued new guidance on what constitutes disturbance to a badger occupying a sett.

1.182 The guidance states the following:

“*badgers live in urban and rural settings, they are widespread and common, they create setts under roads and railways and in urban gardens well used by children and pets. They therefore appear to be able to withstand significant amounts of noise or activity near to their setts without apparently being disturbed*”.

And that:

"*badgers are relatively tolerant of moderate levels of noise and activity around their setts and that low or moderate levels of apparent disturbance around setts do not necessarily disturb the badgers occupying those setts*".

Impact on badger setts

1.183 There is likely to be an indirect impact on the single-entrance sett located in the north-west part of the site at the top of the quarry face. This will occur during the creation of the new access road which will involve the removal of some of the woodland lower on the slope and major engineering works to the rock face below the badger sett. Currently the badgers are undisturbed and in a rural location. The level of noise and activity is likely to disturb any badgers within the sett and could, depending on the method of removing the rock face to the north; result in damage to the sett through vibration.

Foraging

1.184 At present, the badgers principally appear to be using the woodland for foraging and all the well-worn commuting paths occur along the woodland edges or within the woodlands and unimproved calcareous grasslands of Cow Dale LWS. There were no obvious signs of regular use of the quarry floor for feeding purposes, there were no well-worn paths crossing the grassland of the open quarry floor.

Commuting

1.185 Without mitigation, the new access road is set within a deep cutting along much of its length which is likely to present a physical barrier to the movement of badgers both through the site and from the site in to the land to the north of the quarry. This could, without mitigation, fragment the territory of the local badger population.

1.186 Vehicle movements at night could give rise to an increased chance of injury as the animals cross the new road which is to be constructed through the north-west section of secondary woodland.

1.187 Overall, the impact in terms of disturbance and loss of foraging and commuting routes is considered likely to be adverse and significant at the **local** level in terms of its effect on the badger population currently using the overall site. There is **high** confidence in this assessment.

Bats

Evaluation and conservation objectives

1.188 Bats and their habitats are protected under the Wildlife and Countryside Act 1981 (as amended by the CRoW Act 2000), and by the Conservation of Habitats and Species

Regulations 2010. In summary, these make it an offence to damage, destroy or obstruct any place used by bats for breeding and shelter, disturb a bat, or kill, injure or take any bat.

1.189 Seven bat species are listed in the UK Biodiversity Action Plan and are listed as Species of Principal Importance under the provisions of the NERC Act 2006.

1.190 Although no bat roosts have been located within the quarry face and the level and time of bat activity is low, the quarry face does have a wide range of features which bats could use for roosting purposes. However, the quarry face will not be affected directly by the development which will be located 30 metres from the foot of the base.

1.191 The quarry is very open with only a limited level of trees located on the top and foot of the quarry face. The site is relatively high being located at the top of the dale and is exposed to the wind. This could explain the lack of activity on the spoil heaps and open field to the east of the site. Where there was shelter, such as at the base of the quarry face where there is tree growth, common pipistrelle bats were located feeding around the trees.

1.192 Common pipistrelle bats use the quarry face (particularly the more sheltered western end), the woodland edge and scattered trees on the spoil mounds for feeding. Given the abundance of suitable foraging habitats within the surrounding area, the proposed development area is assessed to be of **local** level importance for foraging bats. There is **high** confidence in this assessment.

Ecological effects

1.193 The proposed development will involve the permanent loss of the improved grassland habitat and the two most westerly spoil heap habitats occupying the quarry floor. There will be a loss of a small proportion of the secondary broadleaved woodland in the northwest of the site where the new access road will be created. In addition, the power house structure will be moved. None of the trees within the woodland or the semi-mature trees on the spoil heaps have any features suitable for roosting bats. The power house building is considered to have low potential to support roosting bats.

Impact significance

1.194 No impact on roosting bats is anticipated in relation to the removal of the built structures or semi-mature trees on the spoil heap or the secondary broadleaved woodland.

1.195 No bats were recorded emerging from or commuting/foraging along the quarry cliff face. However, features such as cracks and gaps, which offer potential roosting opportunities, are present within the quarry face, and such features can be used irregularly or unpredictably by roosting bats and can sometimes be hard to detect. At its nearest point the water bottling building will be located 40 metres from the base of the quarry face and should therefore not directly impact upon any bats that may roost within the quarry face in the future.

1.196 An impact through the use of artificial lighting is possible where habitats used by bats could be affected. This could occur during the construction phase though, for example, the use of lighting in working areas during the period when bats are active (from dusk to dawn, between spring and autumn).

1.197 Overall the impact on foraging bats from noise and light disturbance during construction is likely to be negligible but, should inappropriate lighting be used at sensitive times, could possibly be significant at **site** level. There is **moderate to high** confidence in this assessment.

Invertebrates

Evaluation and conservation objectives

1.198 Two days of survey at Cowdale quarry recorded 135 species: this is slightly below what would normally be expected for a site of this size in this location and supporting a range of habitats. This shortfall probably merely reflects the relatively northerly location of Cowdale quarry: No species of invertebrate which are afforded legal protection under UK or European law were recorded from the site.

1.199 For a general assessment, the percentage of Red Data Book or Nationally Scarce species is a useful guide to the overall quality of the site for invertebrates, in comparison to other sites surveyed using similar techniques. Of the 135 species found by this survey, three (2.2%) were Nationally Scarce. A figure of 2.2% is low in a national context. However, the site is possibly the only known Derbyshire site for *Scopaeus sulcicollis* (though this is a species which is likely to go undetected or unreported), on which basis it may have some importance for invertebrates at the **local** level.

Ecological effects

1.200 The proposed development will involve the permanent loss of approximately 8ha improved grassland habitat and two of the spoil heaps occupying the quarry floor (amounts to 23% of the overall spoil heap habitat). The surveys results suggest the spoil heaps are not of high invertebrate value. No rare or scarce invertebrates were found associated with the scree-slopes of the spoil-heaps. There were however, some noteworthy invertebrates: *Scopaeus sulcicollis* and *Armadillidium pulchellum* on the steep face of the spoil-heaps, and *Hydrothassa glabra* and *Malthodes pumilus* from the rubble-strewn grassland at the foot of the slopes. The microhabitat of *Scopaeus sulcicollis* is specialised and this species is unlikely to be able to persist at Cowdale quarry in the absence of scree-slopes. The other species are less dependent on bare, eroding ground and may be more widely distributed on open, calcareous grassland within and around the Cowdale quarry survey area.

Impact significance

1.201 Overall, the impact arising from the loss of improved grassland and approximately a quarter of the spoil heap habitats within the quarry will be adverse and is likely to be significant at a **local** level. There is **high** confidence in this assessment.

Effects during the operation phase

Birds

1.202 Lighting around the bottling plant or security lighting and noise from the new development may have adverse effect on species such as birds, affecting normal diurnal rhythms and communication. This can affect bird breeding success.

1.203 The increased public presence from the workforce that could result from the creation of a new development could give rise to disturbance to birds reducing breeding success.

1.204 During the operational stage, the development could to give rise to an adverse impact on birds which could potentially be significant at a **site** level. There is **high** confidence in this assessment.

Bats

1.205 An impact through the use of artificial lighting is possible where habitats used by bats could be affected (such as quarry edge, woodland edges or mature trees). This will occur during operation phase, for example, through the positioning of any new external lighting and security lighting close to foraging habitats.

1.206 During the operational stage, impacts through lighting could to give rise to an adverse impact on bats which could potentially be significant at a **site** level. There is **moderate** confidence in this assessment.

Badgers

1.207 No impact through the use of artificial lighting is considered likely as the main areas of badger activity is the woodland There will be no external lighting or security lighting close to setts or the woodland.

1.208 The development will lead to an increase the level of traffic entering the quarry bottom where the new bottling plant will be located. The number of traffic movements will be higher during the daytime with staff entering and leaving the various buildings. HGV movements in association with the bottling plant will vary during the year but on a typical day between 50

and 120 HGV movements would be expected (two way total). 70% of the daily movements are between 6am-3pm (i.e. 35-80 HGV movements). Low flows would be expected during the night.

1.209 During the spring, summer and early autumn, badgers would be unlikely to be active when the majority of traffic is using the road. Only in winter and late autumn would there be traffic after dusk and the predicted number of HGV movements is lower in the winter.

1.210 There are potentially significant operational impacts from the increased chance of injury to badgers from vehicles at night, as the animals are likely to be able to cross the new road which is to be constructed through the northern section of secondary woodland. The new road will be set in a deep cutting and without mitigation badgers are unlikely to be able to cross the cutting and access the land to the north of the new road.

1.211 During the operational stage, impacts through an increase in traffic and road fatalities could to give rise to an adverse impact on badgers which could potentially be significant at a **local** level. There is **high** confidence in this assessment.

PROPOSED MITIGATION COMPENSATION AND ENHANCEMENT MEASURES

1.212 A series of mitigation, compensation and enhancement measures have been included within the development design proposals. These have been developed through discussion between the consultant team ecologists, and the consultant team architects and engineers. This has resulted in a variety of mitigation measures being included in the design of the proposed development, aimed at avoiding or minimising identified impacts and where this has not been possible to provide compensation for any adverse effects. In addition, in line with Paragraph 14 and Key Principal iv of PPS9, measures have been included in the development proposals to enhance the biodiversity value of the site overall. These measures are described below:

- The preparation and implementation of a site-wide Ecology Management Plan to enhance the semi-improved grassland areas (68,000m^2), species-rich calcareous grasslands (22,000m^2) and secondary woodland habitats within the site;
- The creation of a 7500 m^2 green roof on the bottling plant building and a 265m^2 brown roof on the Heritage Visitor Centre to compensate for the loss of the ephemeral calcareous grassland and invertebrate habitat (approximately 6530 m^2).
- The planting of 9600 m^2 woodland along the northern edge of the site and on the southern edge to compensate for the loss of ancient and secondary woodland;

- Translocation of ancient woodland ground flora and some of the soil to secondary woodland areas being retained within the development;
- The rock face associated with the creation of the new access road will be sown with a native calcareous grassland see mix using hydro-seeding techniques. The seed mix will be based on the species present within the Cowdale LWS and quarry top.
- The creation of a new pond habitats with native aquatic marginal planting to encourage biodiversity;
- Interpretation of the ecological interest of the site and the management being undertaken within the new Heritage Centre.
- The use of native plant species in formal areas that also provide foraging, nesting and over wintering habitat for wildlife;
- The footprint of the bottling plant building will be set away from the quarry face, and the quarry face will continue be available for wildlife such as nesting birds and bats;
- A Natural England development licence will be secured to allow the exclusion and temporary closure of the outlying badger sett on the top of the north-west corner of the quarry.
- A wildlife bridge will be installed across the new access road to allow badgers and other wildlife to cross to the north east part of the quarry and to access the land beyond.
- It is proposed to minimise the potential for badger road casualties through the use of reflectors on both sides of the road. The reflectors will direct light from car headlights onto the sides of the road, where they would be visible to badgers. This simple measure should be sufficient to deter badgers from crossing the road as vehicles approach.
- The provision of new nest boxes for breeding bird species.

IMPACT ASSESSMENT WITH MITIGATION, COMPENSATION AND ENHANCEMENT MEASURES AND RESIDUAL IMPACTS

1.213 The section assesses the impacts of the proposed development on key ecological receptors taking into account the likely effect of the proposed mitigation, compensation and enhancement measures. The resulting residual impacts following are summarised in Table 11 below.

Non-statutory designated sites

Construction phase

1.214 The loss of a 0.12ha from the southern edge of the Ashwood Dale LWS is unavoidable during the construction phase. In order to compensate for the loss of this ancient woodland, 9600 m^2 of new woodland habitat will be planted along the northern side of the site bordering the existing broadleaved woodland. Woodland will also be allowed to naturally regenerate on the roadside cutting.

1.215 The ancient woodland indicator ground flora species in the area to be lost (where accessible) will either be translocated, or seeds will be collected and propagated to be planted within the well-established secondary woodland within the site which currently supports a relatively impoverished ground flora. A Method Statement will be developed to set out the proposed methodology.

Residual impacts

1.216 The pre-compensation impacts on the Local Wildlife Site are assessed as being adverse and significant at a district level. The proposed compensation will seek to provide new native woodland habitats for species and will reduce the level of habitat loss in the long-term. However, initially the woodland will not fully compensate for the loss of mature ancient woodland. Hence, the significance of the impact is considered to be only slightly reduced, to **local,** in the short-term. There is **high** confidence in this assessment.

Ancient woodland

Construction phase

1.217 The loss of 0.12ha of ancient woodland within the site is unavoidable during the construction phase. In order to compensate for the loss of all the woodland, new woodland habitat of an equivalent area (9600 m^2) will be planted along the northern side of the existing broadleaved woodland and on the southern part of the site.

1.218 The ancient woodland indicator ground flora species in the area to be lost (where accessible) will either be translocated, or seeds will be collected and propagated to be planted within the well-established secondary woodland within the site which currently supports a relatively impoverished ground flora. A Method Statement will be developed to set out the proposed methodology.

Operational phase

1.219 The new woodland habitats within the development will grade into the existing woodland habitats to the north of the spoil mounds. These will provide a buffer to the woodland and the wildlife it supports during the operational phase of the development.

Residual impacts

1.220 The pre-compensation impact on ancient woodland is assessed as being adverse and significant at a district level. The proposed compensation will seek to provide new native woodland habitats (9600m^2) and will reduce the level of habitat loss in the long term. In addition, the broadleaved woodland along the northern and eastern edges of the site (43,500m^2) will be managed to promote the ecological value through the implementation of the Conservation Management Plan. The woodlands will be entered into the Woodland Grant Scheme. However, because initially the new woodland will not fully compensate for the loss of ancient woodland, the significance of the impact is considered to be only slightly reduced, to **local** in the short-term. There is **high** confidence in this assessment.

<u>Secondary woodland</u>

Construction phase

1.221 The loss of secondary woodland within the site is unavoidable during the construction phase. In order to compensate for the loss of the woodland habitats, 9600 m^2 of new woodland will be planted along the northern side of the existing broadleaved woodland and on the southern part of the site.

Operational phase

1.222 The new woodland habitats within the development will grade into the existing woodland habitats to the north of the spoil mounds. These will provide a buffer to the woodland and the wildlife it supports during the operational phase of the development.

Residual impacts

1.223 The pre-compensation impact on secondary broadleaved woodland is assessed as being adverse and significant at a local level. The proposed compensation will seek to provide new native woodland habitats (9600m^2) for species and will reduce the level of

habitat loss in the long term. In addition, the broadleaved woodland along the northern and eastern edges of the site (43,500m^2) will be managed to promote the ecological value through the implementation of the Conservation Management Plan. The woodlands will be entered into the Woodland Grant Scheme. However, initially the new woodland planting will not fully compensate for the loss of mature woodland. Hence, the significance of the impact is considered to remain as **local** in the short-term. There is **high** confidence in this assessment.

Species-rich calcareous grassland

1.224 None of the species–rich calcareous grassland situated on the quarry top or face, or within the Cow Dale LWS (22,000m^2) or the semi-improved neutral grassland (68,000m^2) to the east of the development footprint is to be lost as part of the development. Currently the species-rich calcareous grasslands are unmanaged and the sward is becoming rank and scrub is encroaching. A Conservation Management Plan will be developed to set out detailed management prescriptions for these areas and the aim is to enter the whole site into the Environmental Stewardship Scheme. The long-term aim for these habitats will be to maintain and enhance their botanical and entomological interest.

Residual impacts

1.225 The pre-compensation impacts on the calcareous grassland are assessed as being neutral. The proposed long-term management of the calcareous grassland through the implementation of the proposed Conservation Management Plan and through the Environmental Stewardship Scheme will enhance its botanical interest and the residual impact will be **positive.** There is **high** confidence in this assessment.

Semi-improved neutral grassland

1.226 The semi-natural neutral grasslands (68,000 m^2) on the eastern edge of the site are currently heavily grazed and are improved agriculturally. However, the less intensively grazed areas where the field slopes in a north easterly direction, support a number of species which indicate that historically these areas were of greater botanical interest. A change in the grazing regime to reduce the stocking density will help to restore the whole area to species-rich neutral grassland (excluding a small area behind the houses which will be planted with woodland as part of the woodland compensation).

1.227 *Residual impacts*

1.228 The proposed changes to the management regime of the semi-improved neutral grassland fields will enhance the botanical interest of the fields and the residual impact will be **positive.** There is **high** confidence in this assessment.

Improved grassland habitat

1.229 The pre-compensation impacts on the improved grassland are assessed as being adverse and significant at site level. The proposed compensatory long-term management of the species-rich calcareous grasslands, which are considered to be of county importance and the restoration of the semi-natural neutral grassland, are considered to compensate for the loss of this species-poor habitat.

Residual impacts

1.230 The residual impact will therefore be **positive.** There is **high** confidence in this assessment.

Ephemeral grassland on spoil mound flanks

1.231 The two most westerly spoil heaps will be lost. These amount to 11,500 m^2 in area, of which approximately 6,500m^2 supports ephemeral grassland.

1.232 The loss of the species-poor calcareous grassland communities present on the spoil heaps will be partially compensated for, by the incorporation of a 265m^2 brown roof on the top of the Heritage Centre and a 7500m^2 green sedum roof on the water bottling plant. The brown roof will support ephemeral/calcareous grassland habitats similar to those found on the flanks of the spoil mound and will be specifically designed to provide an enhanced habitat for the fauna, such as invertebrates, associated with the spoil mounds. The sedum roof will also provide a nectar source for invertebrates.

1.233 In addition, the species-rich retained calcareous grasslands within the site will be managed to promote their ecological interest through the re-introduction of low intensity grazing which will be guided by the Conservation Management Plan and Environmental Stewardship Scheme.

Residual impacts

1.234 The pre-compensation impacts on the species-poor, ephemeral calcareous grassland are assessed as being adverse and significant at the site level. The creation of the brown roof on the Heritage Centre and green roof on the bottling plant will help to compensate for the loss of ephemeral grassland on the two spoil mounds and the improved management of the calcareous grassland within the overall site will more than compensate for loss of the species-poor ephemeral calcareous grassland. The residual impact will, in the long-term, be **neutral.** There is **high** confidence in this assessment.

Birds

1.235 Impacts on nesting birds will be avoided by carrying out work which affects suitable nesting habitats (for example, woodland or mature tree clearance) outside the bird nesting season which generally runs between early-March and late-August.

1.236 If this is not possible, and works must take place in the spring and summer, then surveys and supervision will be undertaken to ensure that nests are avoided.

1.237 In the long-term, the creation of 9600m^2 woodland planting to replace the loss of the ancient and secondary woodland to be lost, and the provision of nest boxes and the new tree and shrub planting within the development, will provide replacement foraging and nesting habitat for birds.

Residual impacts

1.238 Pre-mitigation impacts on birds are assessed as being adverse and significant at a site level. The proposed mitigation will seek to minimise the physical impacts on nesting birds, and the birds are not breeding within the habitats that will being lost. The creation of the new native woodland and the provision of nest boxes will compensate for the small loss of existing woodland and the residual impact will in the long-term be **neutral.** There is **high** confidence in this assessment.

Bats

1.239 The pre-mitigation impacts on foraging bats from noise and light disturbance during construction could be significant at **site** level but only if works are carried out at night.

1.240 During the construction phase mitigation will involve minimising the use of artificial light, particularly during summer months along the woodland edges, and the base of the quarry, when bats may susceptible to disturbance from light pollution.

1.241 Mitigation during the operation phase will involve minimising unnecessary artificial lighting of the quarry face and woodland edges within the development site.

Residual Impacts

1.242 Pre-mitigation impacts on bats are assessed as being adverse, and significant at a site level. The proposed mitigation will seek to avoid causing disturbance to bats through the use of artificial lighting along known foraging areas including the quarry edge. Some habitat loss will be unavoidable but this is not considered to be significant given the abundance of suitable foraging habitats within the local area. The significance of the residual impact is considered to be at the **site** level. There is **high** confidence in this assessment.

Badgers

There will be no direct or indirect impact on three of the badger setts, including the very active main sett, as they are all located over 100m from the nearest point of the development and are separated by several spoil mounds which are to be retained.

In order to avoid disturbance or injury to badgers that may be present within the fourth sett on the top of the quarry face it will be necessary to apply for a Development Licence form Natural England to close the sett during the construction phase. This will be re-opened one the construction is completed.

The construction of the new access road will potentially cause disturbance to badgers and could act as a barrier to badgers movement along the northern woodland edge in the long term and could result in an increase in road fatalities.

1.243 During the operational stage, impacts through an increase in traffic and road fatalities could give rise to an adverse impact on badgers which could potentially be significant at a **local** level. There is **moderate** confidence in this assessment.

1.244 A wildlife bridge will be installed to allow badgers (and other wildlife) to cross the new access road to access the woodland to the north- west of the site.

1.245 It is proposed to minimise the potential for badger road casualties from vehicles entering or leaving the site during the hours of darkness by the use of reflectors on both sides of the road. The reflectors will direct light from car headlights onto the sides of the road, where they would be visible to badgers. In addition a site speed limit of 10mph will be set.

Residual Impacts

1.246 The pre-mitigation impact in terms of increase in road fatalities could to give rise to an adverse impact on badgers which could potentially be significant at a local level. The proposed mitigation will reduce the likelihood of impacts but will not remove this risk entirely and there is still a potential for adverse impacts at the **local** level because it cannot be predicted in detail where or when badgers will move. There is **moderate** confidence in this assessment.

Invertebrates

1.247 Replacement compensation habitat will be created on the brown roof of the Heritage Centre building. The species mix that will be sown onto the brown roof will be based on the existing flowering grasses and herbs that occur on the spoil heaps and species-rich calcareous grassland habitats nearby.

1.248 In general, brown roofs are likely to be valuable to invertebrates and their value can be enhanced by incorporating a range of features such as a varied topography and structure, the incorporation of specific flowering plants to provide pollen and nectar source, areas of bare ground, partially buried ridge tiles and clay plant pots with gaps to provide nesting sites for bumble bees.

1.249 The brown roof and newly created grassland habitats will be managed to provide a suitable habitat for invertebrates in the long-term through the production of an Ecology Management Plan.

Residual impacts

1.250 The pre-compensation impact on invertebrates is assessed as being significant at a local level. The creation of the brown roof and the long-term management of species-rich calcareous grassland and the semi-improved neutral grassland habitats will reduce the significance of the impact to be adverse, but only at the **site** level. There is **high** confidence in this assessment.

Table 11: Significance of residual impacts after implementation of proposed mitigation/compensation

Feature	Evaluation	Impact and significance prior to mitigation/compensation	Residual Impact	Confidence
Peak District Dales SAC	International importance	Neutral	Neutral	High
Cow Dale LWS	County importance	Neutral	Positive	High
Ashwood Dale LWS	County importance	Adverse, district level	Adverse, significant at local level	High
Ancient woodland	District importance	Adverse, district level	Adverse, significant at local level	Moderate to High
Secondary broadleaved woodland	Local importance	Adverse, local level	Adverse, significant at local level	Moderate to High
Calcareous grassland	County importance	Neutral	Positive	High
Neutral grassland	Site importance	Adverse, site level	Positive	High
Semi-improved neutral grassland	Local importance	Neutral	Positive	High
Improved grassland	Site Importance	Negligible at a site level	Positive	High
Ephemeral calcareous grassland	Local importance	Adverse, significant at a site level	Neutral	High
Birds	Local importance	Adverse, significant at a site level	Neutral	High
Badgers	Local importance	Adverse, significant at a local level	Adverse, significant at local level	High
Bats	Local importance	Adverse, significant at a site level	Adverse, significant at site level	High
Reptiles	Not considered to be present	Neutral	Neutral	High
Invertebrates	Local importance	Adverse, significant at a local level	Adverse, significant at site level	High

Summary of Residual Effects

1.251 Local level residual impacts remain for receptors Ashwood Dale LWS, ancient woodland and secondary woodland. The mitigation measures proposed will slightly reduce the significance of the majority of the impacts but they are still assessed to be significant at **local** level. The Impact on badgers will remain significant at the **local** level because the new access road could lead to an increase in road fatalities and could act as a barrier to movement of the local badger population. Impacts on nesting birds and invertebrates will remain significant at a **site** level. A site level impact is the lowest level of impact significance, the impacts being significant only within the context of the site and insignificant in any wider context.

1.252 With the creation of the green and brown roofs the residual impacts will be neutral for the ephemeral grassland receptor and similarly with birds, with the new planting and other compensation measures the impact has been reduced to neutral.

1.253 The proposed management of the grassland habitats within the site will result in a positive residual impact for calcareous grassland receptors.

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