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**UK COAL SURFACE MINES LIMITED**

**Great Oak, Staffordshire**

**Ecological Assessment**

**January 2014**

*your earth our world*



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**UK COAL SURFACE MINES LIMITED**

**Great Oak, Staffordshire**

**Ecological Assessment**

**January 2014**

**PREPARED BY:**

Jonathan Ayres Associate Director (Ecology)

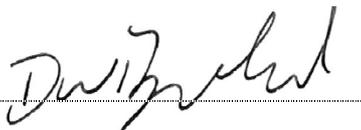


Caroline Mellor Associate Director (Ecology)



**APPROVED BY:**

David Bridgwood Technical Director



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## **1 INTRODUCTION**

1.1 This report has been prepared on behalf of UK Coal Surface Mining Ltd in support of a planning application for development of the Great Oak site as a surface mine for the winning and working of coal and associated minerals. This report will form part of the Environmental Statement which accompanies the planning application. The report aims to:

- Describe the ecological baseline conditions within the proposed development;
- Identify and evaluate the ecological receptors;
- Identify any potential impacts (during the site preparation, construction activities, operational phase and restoration);
- Establish the magnitude and significance of those identified impacts;
- Identify the mitigation measures to address significant impacts; and
- Assess any residual impacts and the need for any compensation.

1.2 This report also includes information to support a Habitat Regulations Assessment (HRA) to identify if there are likely to be any significant effects on European sites; and a Water Framework Directive Assessment (WFDA) to address potential effects on the water environment.

## **2 DEFINITION OF TERMS**

- 2.1 The proposed development site boundary is defined by the red line on drawing number ST12313-002 Site Location Plan (hereafter referred to as the “site”). This chapter considers habitats and species within the site and adjacent 30m zone of influence, or those which are functionally linked to it.
- 2.2 At the time of undertaking the baseline desk study, assessments and field work the development footprint had not been finalised. As such a larger “survey area” shown on ST12313-002 as the blue line boundary was surveyed and the results of the wider survey area are presented in the baseline reports, attached as Appendices 1 to 8.

### 3 SITE DESCRIPTION

- 3.1 The Great Oak site has a total site area of approximately 80 hectares and is predominantly used as agricultural grazing land.
- 3.2 The site is located approximately 6 kilometres to the north-west of Newcastle-under-Lyme. The settlement of Bignall End is located to the south-west of the site. Bignall Hill and Butters Green lie to the south. Red Street is located to the south-east. To the north is the A500 dual carriageway, beyond which lies the settlement of Talke (to the north east of the site). The site location is shown outlined in red on drawing reference 36/D02.
- 3.3 The Site's northern boundary runs mostly parallel to the A500 highway. The A500 is a large, dual carriageway arterial road that runs east-west, linking Stoke-on-Trent with the M6 Motorway, Nantwich and Crewe. The carriageway sits atop an embankment, above the fields to the north of the Site, however the road is at a lower level than a majority of the Site. Woodland plantations have been established along the embankment slopes along the road. The highway follows the line of the old Jamage Branch line, a minerals railway which serviced the Jamage and Rookery collieries in the later part of the 19th and early 20th centuries.
- 3.4 The Site borders a stretch of Bignall End Road. This is a minor road linking the settlements of Bignall End (south of the Site) to the hamlet of Dunkirk and town of Talke further north. The road is bordered by mature hedges along most of its route, and passes beneath the A500 at the Site's northern extents.
- 3.5 Audley Road (B5500) runs east-west to the south of the Site. It is bordered by residential and commercial properties through the settlements of Bignall End, Butters Green and Audley. Audley Road links the village of Audley to the west, with Red Street/Chesterton in the east. The road, although only a single carriageway, has a reasonable width and is embanked in some sections along its sections in proximity to the Site. It is bordered by hedgerows along much of its length when in rural settings, and by dwellings in urban areas.
- 3.6 Residential areas are located to the south and west of the Site at Bignall End, Butters Green, Boon Hill, Rye Hills, Woodland/Megacre, and Audley. Further residential areas are located to the northeast at Talke and Talke Pits. These are predominantly small detached and semi - detached two storey properties. The only premises directly bordering the Site are those of Woodlands Farm and Hall, Northwoods, and Diglake Farm.

3.7 The Site is accessed by 5 public Rights of Way (RoW), within or bordering the Site. These are numbers 77, 80, 92, 113 (Audley) and 1 (Kidsgrove). Many more footpaths interlink and connect with these paths, running in a generally north-south orientation (SCC, Not Dated).

## **4 THE DEVELOPMENT PROPOSALS**

4.1 The proposed development, a surface coal mine, includes the following activities which may have impacts on the ecology of the site:

- Site Preparation (vegetation clearance/stripping);
- Construction Activities;
- Operational Phase (excavation and pumping of void, lighting, vehicle movements and pollution);
- Restoration.

4.2 Detailed information regarding the geology of the site is contained within Chapter 6 of the Environmental Statement. Details of the proposed method of working are contained within Chapter 7 of the Environmental Statement. This report has taken into account the geology of the site and details of the proposed working, so far as this is relevant to the consideration of the ecological conditions on the site.

## 5 METHODOLOGY

5.1 The desk study, field surveys and assessment methods have been undertaken in accordance with the Chartered Institute of Ecology and Environmental Management (CIEEM) guidance on Ecological Impact Assessment (EclA). All ecological surveys undertaken for the ecological impact assessment were carried out by appropriately qualified and experienced ecologists<sup>1</sup>.

### Desk Study

5.2 Baseline data on the nature conservation interest of the Site and its surroundings, including information on statutory and non-statutory designated nature conservation sites and protected and notable species (defined in Table 1) were sought from the following sources:

- A study of aerial photography, Ordnance Survey (OS) mapping, and UK Coal's detailed topographical survey to determine the presence of ponds and other features of nature conservation interest;
- A review of appropriate planning policies, county and UK Biodiversity Action Plans (UKBAP);
- The Multi-Agency Geographic Information for the Countryside (MAGIC) website was consulted for details of European designated sites and Sites of Special Scientific Interest (SSSIs) within 10km and other statutory designated sites within 2km of the site;
- The 'Nature on the Map' website, maintained by Natural England, was searched for details of Local Nature Reserves (LNR) and areas of priority habitats listed in the UKBAP within 2km of the site;
- Staffordshire Ecological Record (SER) was consulted for information on protected species and statutory and non-statutory designated sites within 2km of the site.

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<sup>1</sup> All ecologists are members of, or acted under the supervision of, CIEEM and are bound by its code of professional conduct.

**Table 5: Site of Nature Conservation Value and Protection & Notable Species.**

**Statutory nature conservation sites**

Natural England notified sites that are of national importance for nature conservation as Sites of Special Scientific Interest (SSSIs), although some sites that are of national importance for certain species have not been so designated. Internationally important sites may also be designated as Special Areas of Conservation (SACs), Special Protection Areas (SPAs) or Ramsar sites (it should be noted that SSSI designations also apply to most internationally designated sites).

**Non-statutory nature conservation site**

In Staffordshire non-statutory wildlife sites are entitled Sites of Biological Importance (SBI), these are sites of local importance and contain most of the best remaining areas of semi-natural habitat in the county. A process undertaken by the Local Authority to survey the quality of these sites has resulted in the recognition of a series of county SBIs, ranked into two categories of value, namely Grade 1 and Grade 2. Grade 1 sites are those categorized as SBI's and are the equivalent of the UK governments Local Wildlife Site (LWS) designation and whilst not legally protected they must be taken into account by the Local Planning Authority when considering any applications that affect SBI's. Grade 2 sites or Biodiversity Alert Sites (BAS) are non-statutory wildlife sites considered to be of local importance.

**Protected species**

Many species of animal and plant receive some degree of legal protection. For the purpose of this study, legal protection refers to:

Species included on schedule 1, 5 and 8 of the Wildlife and Countryside Act 1981 (as amended) such as water vole (*Arvicola amphibius*) and otter (*Lutra lutra*), excluding species that are only protected in relation to their sale (see Section 9[5] and 13 [2], reflecting the fact the proposed development does not include any proposals relating to the sale of species;

Species included on Schedule 2 and 5 of the Conservation of Habitats and Species Regulations 2010 as amended in England and Wales, such as bats and otter; and Badgers (*Meles meles*), which are protected under the Protection of Badgers Act 1992 (as amended by the Nature Conservation Act 2004).

**Notable species**

Species listed under the UKBAP and/or Local BAP or those which are of some other conservation interest based on their status nationally, regionally or locally.

### **Field Surveys**

- 5.3 An Extended Phase 1 Habitat Survey was undertaken in June and July 2011. The area was surveyed to Phase 1 standard with target notes taken as appropriate following guidance set out in the Handbook for Phase 1 Habitat Survey – a Technique for Environmental Audit (JNCC, 2010). Habitats were mapped and observations recorded of protected and BAP species along with signs or features. For full details refer to Appendix 1.
- 5.4 In addition to the Extended Phase 1 Habitat Survey the following Phase 2 specialist surveys and assessments were undertaken in 2011, 2012 and 2013. Detailed methodologies are provided within the individual baseline reports, attached as Appendices 2 to 8.

### ***Amphibian Surveys***

- 5.5 Surveys for great crested newt were undertaken in spring 2012 and repeated in spring 2013. The surveys were undertaken in accordance with the guidelines set out in the *Great Crested Newt Mitigation Guidelines* (English Nature (now Natural England) 2001). The methods and results are presented in Appendix 2 Amphibian Survey Report 2013.

### ***Badger Activity Survey***

- 5.6 A detailed badger survey was undertaken in January 2012 and a brief walkover survey was undertaken in October 2013 to check the status of the setts found during January 2012. All further information relating to badgers can be found within Confidential Badger Survey Report.

### ***Bat Survey***

- 5.7 In June 2012 a daytime inspection of trees, buildings and structures for bat roosting potential was undertaken. Following this, dusk emergence and dawn re-entry surveys were undertaken on several buildings, bridges and trees between July and August 2012. Bat activity surveys were also undertaken across the site each month between June and September 2012. Full details are provided at Appendix 3 Bat Survey Report.

- 5.8 Survey methodologies within the Bat Workers' Manual (Joint Nature Conservation Committee, 2004), Bat Surveys: Good Practice Guidelines (BCT, 2012) and Guidance for Natural England's National Nature Reserves, Bat habitat assessment prior to arboricultural operations (Natural England, 2010) were used as guidance.

#### ***Barn Owl Surveys***

- 5.9 A barn owl scoping assessment was undertaken in January 2012. The aim of the survey was to identify locations of potential barn owl breeding/roosting sites; identify the number of sites found to be occupied; and to locate foraging routes/areas within the site. Following the scoping assessment, additional vantage point survey for barn owl focussing on features identified as having potential to support breeding barn owl was completed in June and July 2012. All further information relating to barn owls can be found within the Confidential Barn Owl Survey Report.

#### ***Breeding Bird Surveys***

- 5.10 Following an initial scoping survey during March 2012 breeding bird surveys were undertaken over three site visits between April and June 2012. Survey methods were based on an adapted version of the Common Bird Census (CBC) (Gilbert *et al* 1998). Results and methods are presented in Appendix 4 Breeding Bird Survey Report.

#### ***Invasive Species***

- 5.11 In August 2012 the site was surveyed for the presence of invasive plant species listed under Schedule 9 (section 2) of the Wildlife and Countryside Act 1981 (as amended).

#### ***Invertebrates Scoping Assessment***

- 5.12 An invertebrate scoping study was undertaken in April 2012 to assess the quality of the site for invertebrates and a suite of follow up surveys were undertaken in June and July 2012. The aim of the survey work was to identify the presence of any species assemblages of high potential value and identify any invertebrate species of conservation importance. Detailed methods and results are given in Appendix 5 Invertebrate Assessment Report.

### **Reptile Surveys**

- 5.13 Presence/absence surveys for reptiles were undertaken in May 2012 in areas of suitable habitat identified during the Extended Phase 1 Habitat Survey. The surveys were carried out in accordance with the *Herpetofauna Workers' Manual* (Gent & Gibson, 1998; 2003) and *Reptile Advice Sheet 10* (Froglife, 1999) see Appendix 6 - Reptile Survey Report for details.

### **Wintering Bird Surveys**

- 5.14 The site was visited monthly between November 2011 and February 2012. The survey visits consisted of systematic walkovers of the site recording all bird species observed or heard and approximate numbers recorded. Details are provided in Appendix 7 Wintering Bird Survey Report. Field survey methods were based upon, and adapted from generic wintering bird monitoring methods given in Gilbert et al. (1998).

### **Arboricultural Survey**

- 5.15 An arboricultural survey was undertaken in February and April 2012. The survey and assessment included consultation, desktop review and a site visit. The survey followed the methodology as set out in both Natural England's Specialist Survey Method (SSM) and British Standard 5837:2012 *Trees in relation to design, demolition and construction – Recommendations*, Appendix 8 Arboricultural Survey Report.

### **Presentation of Results**

- 5.16 This section follows the guidance presented in Guidelines for Ecological Impact Assessment (CIEEM 2006). Significance of impacts has been determined by identifying ecological features, evaluating their importance and defining the impacts. The CIEEM guidelines define a significant impact as:

*“an impact (adverse or positive) on the integrity of a defined site or ecosystem(s) and/or the conservation status of habitats or species within a given geographical area, including cumulative impacts.”*

### ***Determining Value of Ecological Features***

- 5.17 In order to objectively assess impacts arising from a particular development it is essential to establish the nature conservation value of each ecological feature/receptor likely to be affected by the development.
- 5.18 The importance of each ecological feature identified through consultation and survey is evaluated according to its importance in a geographical context, each falling into one (or more) of the following categories:
- International (in this case within the EU, unless stated otherwise);
  - National (within the UK or Wales/England, depending on legislative scope);
  - Regional (West Midlands);
  - District (Staffordshire);
  - Local (Stoke-on-Trent/Newcastle-under-Lyme);
  - Within the Zone of Influence;
  - Of negligible importance.
- 5.19 The 'Zone of influence' is defined by IEEM Guidelines for Ecological Impact Assessment (2006) as:
- 'The areas/resources that may be affected by the biophysical changes caused by activities associated with a project'.*
- 5.20 The zone of ecological influence for the site occupies the development boundary and also extends 30m to *include areas which may be indirectly impacted as a result of the proposed development.*
- 5.21 When a feature falls into more than one value category, it is considered within the highest level. Some features can be readily assigned to one of the above categories, particularly statutory designated sites. For example, a feature with a designation assigned through European legislation, such as a Special Area of Conservation (SAC) would be considered of International value and a Site of Special Scientific Interest (SSSI) designated by UK statute would be of *National* value.
- 5.22 Individual species may be protected under European or National legislation, such protection is relevant to the assignment of value to such species, but additional

factors, such as population size and the nature of the distribution of the species are also considered.

- 5.23 The assignment of undesignated features such as Biodiversity Action Plan habitats and species, trees with Tree Preservation Orders (TPOs) or areas of ancient woodland may not fall clearly into the designations as described above. Therefore a number of other criteria are used to assess the nature conservation value of a defined area of land. Accepted criteria are set out in *A Nature Conservation Review* (Ratcliffe, 1977) and include diversity, rarity, naturalness, intrinsic appeal, typicalness and recorded history.
- 5.24 Some features that are currently of no particular ecological interest in themselves may nevertheless perform an ecological function. For example they may act as a buffer against negative impacts.
- 5.25 Each ecological feature is described and evaluated in the 'Baseline Conditions' section of this chapter.

### **Magnitude of Impact**

- 5.26 Likely impacts on the ecological features occurring within the survey area were identified through consideration of the development proposals. The impacts have been characterised with reference to the following:
- levels of certainty in the prediction of an impact occurring;
  - the extent of the impact;
  - its magnitude;
  - duration of the impact;
  - whether the impact is reversible;
  - its timing and frequency; and
  - whether any of the impacts are cumulative in effect.

### **Confidence in Predictions**

- 5.27 The likelihood of change or an activity occurring as predicted has been determined based on the fact that the 5% confidence level is conventionally chosen as the lowest

limit for acceptable statistical significance in common scientific practice, the following four-point scale has been employed:

- Certain/near-Certain: probability estimated at 95% chance or higher.
- Probable: probability estimated above 50% but below 95%.
- Unlikely: probability estimated above 5% but less than 50%.
- Extremely Unlikely: probability estimated at less than 5%.

### **Evaluation of Significance**

5.28 This comprises analysis of the interaction between the value of the ecological features and the nature and duration of impact. However, this is a complex process because, as indicated in the IEEM guidance, the impact may influence the conservation status and integrity of ecological features.

5.29 The definition of significance in relation to habitats is:

*“conservation status is determined by the sum of the influences acting on the habitat and its typical species, which 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.*

*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’.*”

## 6 LEGISLATIVE FRAMEWORK AND PLANNING POLICY

- 6.1 Nature conservation policy is implemented through a series of areas, habitats and species designated under legislation from a local to an international level. The key pieces of legislation relevant to the proposed activities are listed below.
- 6.2 The Wildlife and Countryside Act 1981 (as amended) remains the primary UK mechanism for statutory site designation and protection, and the protection of individual species. Through it, areas of national or regional conservation value (in terms of their biological or geological interest) can be designated as SSSIs. This affords protection by way of limiting the activities which can be carried out on such sites, and imposing penalties for damage or destruction of the special interest. The Wildlife and Countryside Act also contains a number of schedules listing species subject to varying levels of protection. The provisions of the Wildlife and Countryside Act are modified and in some cases replaced by subsequent legislation contained within the Conservation of Habitats and Species (Amended) Regulations 2012.
- 6.3 EC Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Flora and Fauna ('the Habitats Directive') was adopted in May 1992. The Annexes to this Directive list species and habitats identified as of 'community interest' and for which the Commission requires the establishment of a network of sites to protect examples of value at European level. These sites, called Special Areas of Conservation (SACs), in conjunction with Special Protection Areas (SPAs) designated under the Birds Directive, form a network of protected sites across Europe referred to as Natura 2000 Network.
- 6.4 The Countryside and Rights of Way Act 2000 strengthens the provisions of the 1981 Wildlife and Countryside Act both in respect of statutory sites, such as SSSIs, and protected species. It also places a statutory obligation on local authorities and other public bodies to further conservation of biodiversity in the exercise of their functions.
- 6.5 A summary of the legislation protecting relevant taxa/species is provided in Table 2 below.

**Table 2: Protected Species Legislation**

Species	Key legal protection
<b>Badgers</b>	Badgers and their setts are protected under the Protection of Badgers Act (1992), which consolidated and added to previous legislation. It is illegal to wilfully kill or injure a badger or to interfere with a sett, unless a licence is granted. A licence may be granted by Natural England for the purpose of development (amongst other reasons) as defined in Section 55 (1) of the Town and Country Planning Act 1990.
<b>Bats</b>	All bat species are protected in accordance with Schedule 5 of the Wildlife and Countryside Act (1981, as amended). This protection extends to both the bats themselves and roost sites. Bat roosts are protected at all times of the year regardless of whether bats are present at the time. In addition, all bats are listed under Annex II of the European Unions Habitats Directive.
<b>Birds</b>	All wild birds, their nests and eggs are, with few exceptions, fully protected by law. In addition, over eighty species or groups of species, are listed under Schedule 1 of the Wildlife and Countryside Act. These species are specially protected by increased penalties and cannot be intentionally disturbed when nesting, with additional protection also provided to species listed in Annex IV of the Habitats Directive.
<b>Great crested newt <i>Triturus cristatus</i></b>	Protected under the Wildlife and Countryside Act and under Annex II and IV(a) of the European Union's Habitats Directive. Under the legal protection afforded to great crested newts, it is an offence to knowingly kill, harm, injure or disturb a great crested newt or its habitat. It is also an offence to damage, destroy or obstruct access to any structure or place used for shelter protection or breeding by the species; or to disturb it while it is occupying such a structure or place.

**Table 2: Protected Species Legislation**

<b>Species</b>	<b>Key legal protection</b>
<b>Invasive species</b>	Species are listed under Schedule 9 of the Wildlife and Countryside Act 1981 (as amended). By law it is an offence to plant, or cause plants listed under Schedule 9, to grow in the wild.
<b>Reptiles</b>	All native reptiles receive legal protection arising from the Wildlife and Countryside Act 1981 and the Conservation of Habitats and Species (Amendment) Regulations 2012 (smooth snake and sand lizard). In England and Wales reptiles are all listed on Schedule 6 of the Wildlife and Countryside Act 1981.

## **Planning Policy Context**

6.6 This section outlines the planning policies relating to nature conservation, at a local and national level. These policies guide the planning process and as such the context of this proposed development.

### ***National Policy***

6.7 The National Planning Policy Framework (NPPF) issued March 2012 sets out the Government's policies on planning. It supersedes Planning Policy Statement 9 *Biodiversity and Geological Conservation*. The NPPF is a material consideration to be taken into account by Local Planning Authorities (LPAs) when formulating planning policy and by decision makers when determining individual planning applications. Section 11 of the NPPF refers to *Conserving and enhancing the natural environment*.

6.8 A joint Office of the Deputy Prime Minister (06/2005) and Department of Environment, Food and Rural Affairs (01/2005) Circular *Biodiversity and Geological Conservation – Statutory Obligations* sets out the wide range of legislative provisions at the international and national level that can impact on planning decisions affecting biodiversity and geological conservation issues.

6.9 As part of its commitment to the Convention on Biological Diversity drawn up at the Earth Summit in Rio de Janeiro in 1992, the government published 'Biodiversity: The UK Action Plan' (DOE 1994). Following this a National Biodiversity Action Plan was produced and Species and Habitat Action Plans (SAPs and HAPs respectively) drawn up for key species and habitats. The SAPs and HAPs set out targets for retention and enhancement of the identified key habitats and species.

6.10 Many counties now have their own local Biodiversity Action Plans (LBAPs) which set out objectives for their own localities.

### ***Development Plan***

6.11 The Development Plan currently comprises:

- Staffordshire Minerals Local Plan 1999;
- Newcastle under Lyme Local Plan 2011;
- Newcastle under Lyme and Stoke on Trent Spatial Strategy 2006-2026.

- 6.12 According to the National Planning Policy Framework (NPPF) decision takers may also give weight (unless other material considerations indicate otherwise) to relevant policies in emerging plans according to their stage of preparation, the extent of unresolved objections to relevant policy and the degree of consistency of the emerging plans to the policies in the NPPF.

### ***Local Policy***

- 6.13 The following paragraphs provide the relevant policies within the Newcastle-under-Lyme and Stoke-on-Trent Spatial Strategy, 2006-2026, Newcastle under Lyme Local Plan, Adopted 2003 and the Staffordshire Minerals Local Plan 1999.

### ***Newcastle under Lyme and Stoke on Trent Core Spatial Strategy***

- Policy CSP10 - Planning Obligations;
- Policy CSP4 – Natural Assets

### ***Newcastle under Lyme Local Plan***

- Policy N2 – Development and Nature Conservation – site surveys;
- Policy N3 – Development and nature conservation – protection and enhancement measures;
- Policy N4 – Development and nature conservation – use of local species;
- Policy N8 – Protection of key habitats;
- Policy N10 – New Woodland – considerations;
- Policy N12 – Development and the Protection of Trees;
- Policy N13 – Felling and Pruning of Trees
- Policy N14 – Protection of landscape features of major importance to flora and fauna.

### ***The Staffordshire Minerals Local Plan***

- Policy 9 - Site restoration and aftercare;

- Policy 10 - Off-site environmental improvements or nature conservation works;
- Policy 19 - Special interest of the areas;
- Policy 20 - where approved development affects sites or features of natural or cultural conservation value, appropriate measures will be required;
- Policy 22 - Agreed vegetation establishment.

## 7 BASELINE CONDITIONS

### Desk Study

#### *Aerial Photography and Map Data*

7.1 From the study of aerial photography, OS maps and UK Coal's detailed topographical site survey, the following habitat features were identified:

- Five waterbodies located within the site boundary including ponds and ditches;
- Several ponds located within 500m of the site;
- Blocks of woodland within and adjacent to the site; and
- A former railway line running north to south.

#### *Designated Sites*

7.2 Consultation highlighted the presence of the following statutory designated sites within the search area (information regarding the definition of these terms can be found in Table 5):

- Midlands Meres and Mosses Ramsar site comprising a number of component Sites of Special Scientific Interest (SSSIs) of which the nearest is located approximately 6km north west of the site;
- Bradwell Woods LNR is situated approximately 1km south-east of the site and is noted for its semi-natural woodland, grasslands and water features;
- Metallic Tileries Park House SSSI is situated approximately 1.7km south-east of the site and is designated for non-marine bivalves, ostracods, fish and annelid worms, and a unique non-marine algal flora;
- Bateswood LNR is situated approximately 1.7km south-east of the site boundary and is an area of semi-natural broadleaved woodland with a species rich ground flora;
- Ford Green Reedbed SSSI is located approximately 8km east of the development and comprises a small wetland in the floodplain of the River Trent;
- Roe Park Wood SSSI is located approximately 10km north-east of the development and comprises an area of extensive semi-natural ancient woodland;

- Ganister Quarry is located approximately 10km north-east of the development and is of geological importance;
- Sandbach Flashes SSSI is located approximately 10km north-west of the development and comprises a series of pools freshwater and saline habitats.

### ***Non-Statutory Sites***

7.3 There is one Site of Biological Interest (SBI) within the site:

- Bignall End Coal Yards Site of Biological Importance (Grade 1 SBI) extends north to south in the centre of the site and comprises a section of disused railway line which is designated for its areas of heathland, broadleaved woodland, species-rich grassland and scrub.

7.4 The following SBIs and Biodiversity Alert Sites (BAS) are located within 2km of the site:

- Bignall End Road BAS (Grade 2 SBI) is located immediately adjacent to the west site boundary. The BAS is an area of species poor semi-improved, marshy grassland running along the Brierly Brook;
- Parrots Drumble SBI is located approximately 170m from the site is an area of ancient semi-natural valley woodland, managed as a Staffordshire Wildlife Trust Reserve;
- Apedale Marsh SBI is located approximately 0.8km south of the site boundary and comprises plantation and semi-natural broadleaved woodland with associated fishing pools;
- Audley Castle Banks Biodiversity Alert Site (BAS) is located approximately 1km south west of the site and is an area of scattered scrub and unimproved acidic grassland;
- High Carr Colliery (woodland south of) BAS is located approximately 2.1km east of the site boundary and comprises woodland with an associated stream;
- Kent Hill Quarry BAS is located approximately 2.2km west of the site boundary. This BAS is an area of woodland and is also of geological interest;

- Bradwell Wood SBI is located approximately 2.5km south-east of the site boundary and comprises broadleaved woodland, pools and a stream;
- Watermills Wood SBI is located approximately 2.5km south-west of the site boundary and comprises woodland, scrub, grassland and waterbodies;
- Podmore Pool SBI is located approximately 2.5km south-west of the site boundary and comprises a mixture of habitats including semi-natural and planted broadleaved woodland, acid and neutral grassland, acidic dry heath and a pool;
- Apedale Disused tips BAS is located approximately 2.5km south of the site boundary and was previously an opencast workings and now comprises plantation woodland, scrub, grassland, standing and running water;
- Bates Wood BAS is located approximately 3km south-west of the site and comprises semi-natural broadleaved woodland with an associated stream;
- Burgess's Wood BAS is located approximately 3km south-west of the site boundary and comprises an area of woodland;
- Bathpool Park SBI is located approximately 3.3km north-east of the site boundary and comprises an extensive mosaic of woodland and grassland habitats;
- Hayes Wood and Dismantled Railway SBI is located approximately 3.5km south-west of the site and comprises ancient semi-natural woodland and semi-improved grassland along a disused railway line.

### ***Biodiversity Action Plans (BAPs)***

7.5 The current Staffordshire Biodiversity Action Plan (SBAP) has adopted an ecosystem or landscape level approach. The county has been split into different ecosystem action plans (EAPs). The development site falls within the "Urban" EAP. The following habitats and species plans are included within this EAP, shown within Table 3 below. This has been summarised to include plans that are relevant to the proposed development:

<b>Table 3: Staffordshire Biodiversity Action Plan</b>
<b><i>Habitats within the Urban EAP</i></b>
Lowland meadows
Native woodland
Hedgerows
Lowland dry acid grassland
Lowland heathland
Wood pasture-parkland
Eutrophic standing water
Ponds
<b><i>Species within the Urban EAP</i></b>
Bats
Bumble bees
Cornflower <i>Centaurea cyanus</i>
Farmland seed eating birds
Grasshopper warbler <i>Locustella naevia</i>
Great crested newt <i>Triturus cristatus</i>
Grey partridge <i>Perdix perdix</i>
Hedgehog <i>Erinaceus europaeus</i>
House sparrow <i>Passer domesticus</i>
Lapwing <i>Vanellus vanellus</i>
Otter <i>Lutra lutra</i>
Polecat <i>Mustela putorius</i>
Skylark <i>Alauda arvensis</i>
Slow worm <i>Anguis fragilis</i>
Spotted flycatcher <i>Muscicapa striata</i>
Song thrush <i>Turdus philomelos</i>
Toad
V moth <i>Macaria wauaria</i>
Wall <i>Lasiommata megera</i>
Water vole <i>Arvicola amphibious</i>
White-letter hairstreak <i>Satyrrium w-album</i>
Yellow wagtail <i>Motacilla flava</i>

### ***Protected/Notable Species Records***

7.6 The desk study results are summarised below and full details can be found within Appendix 1:

- Great crested newt (the closest record is located approximately 800m south of the site) and common toad *Bufo bufo*;
- Polecat, brown hare and hedgehog *Erinaceus europaeus* (UKBAP priority species and listed within the SBAP);
- Brown long-eared *Plecotus auritus*, pipistrelle *Pipistrellus sp.*, *Myotis* and soprano pipistrelle *Pipistrellus pygmaeus* bats;
- Water vole;
- Small heath *Coenonympha pamphilus*, dingy skipper *Erynnis tages*, white-letter hairstreak *Satyrion w-album* and several UKBAP moth species;
- Grass snake *Natrix natrix* and common lizard *Zootoca vivipara*;
- Bluebell *Hyacinthoides non-scripta*;
- Schedule 1, birds of conservation concern and UKBAP species; of particular note are records of merlin *Falco columbarius*, redwing *Turdus iliacus* and fieldfare *Turdus pilaris* (Schedule 1 species) within the site.

### **Field Surveys**

#### ***Habitats***

7.7 The main habitats within the site are described below. Additional details are shown on the Extended Phase 1 Habitat Survey Plan ST12313-005. The target notes and species recorded during the site survey are listed within Appendix 1. The following paragraphs summarise information within the Extended Phase 1 Habitat Survey Report.

#### ***Buildings and Disused Railway Line***

##### ***Diglake Farm***

7.8 A farm comprising a farmhouse and adjacent storage barns (Appendix 1, Target Note B3). The farmhouse is a two storey property of brick construction with a tiled roof. The adjacent barn is also of brick construction with a pitched tiled roof.

### Disused Railway Line

- 7.9 Throughout the centre of the site is a disused derelict railway line that was formerly associated with the mining works (the former Madeley to Alsager railway line from Bignall End). The railway line is now encroached by scrub and self-set woodland largely comprising oak *Quercus* sp., sycamore *Acer pseudoplatanus*, hawthorn *Crataegus monogyna* and silver birch *Betula pendula*. Ground flora is sparse due to the dense canopy structure limiting light availability at the woodland floor however; scattered areas of bluebell *Hyacinthoides non-scripta* remain. Patches of bramble *Rubus fruticosus* agg., common heather *Calluna vulgaris* and herb-rich grassland are located around the peripheries. Old, disused railway bridges are still in place in association with the redundant railway line (Appendix 1, Target Note 4 and 5).

### *Adjacent properties*

- 7.10 There are several farm buildings, residential properties and a small gas sub-station (Appendix 1, Target Note B6) located within the 30m zone of influence:
- Woodlands Farm located to the north of the site boundary (B4);
  - Jamage Farm located to the north-east of the site boundary (B5).

### *Broad-leaved semi-natural woodland*

- 7.11 Broad-leaved, semi-natural woodland can be found across the site with significant stands located along the disused railway line (in association with the SBI) and around the disused mine shafts. The woodland areas have regenerated following the cessation of mining and industrial works and are currently composed of a sycamore dominated wooded gully associated with the disused railway line and a dense stand of sycamore located north west of Bignall Hill.

### *Hedgerows*

- 7.12 Hedgerows are associated with the boundaries of agricultural and grassland fields on site. Many of the hedgerows on site are species poor and defunct.

### *Water Features*

- 7.13 There are two ponds (WB1 and WB5) and several ditches (WB4, WB27 and WB28) located within the site; these are shown on drawing number ST12313-004 and described in Appendix 1.

### *Scrub*

- 7.14 Areas of scattered scrub exist throughout the site generally comprising stands of gorse, bramble and hawthorn.

### *Grassland*

- 7.15 The site is dominated by improved and semi-improved grassland with a more acidic species composition at higher elevations particularly associated with the area around the Wedgewood Monument. There are also sporadic patches of rush pasture associated with areas of poor drainage. Areas of marshy grassland are located across the site and comprise, amongst grasses and other species, soft rush *Juncus effusus*, marsh thistle *Cirsium palustre* and common sorrel *Rumex acetosa*.

### *Arboricultural Survey*

- 7.16 The majority of trees were found to be in fair to good physiological and structural condition. A number of high retention value individual, hedgerow and grouped oak trees were identified. The remainder of the tree population on site is of moderate to low value. The site is covered by Tree Preservation Order Number 1 (refer to Appendix 8).

### ***Species***

#### *Badger*

- 7.17 Badgers were recorded on site.

#### *Amphibians – Great Crested Newt*

- 7.18 There are several waterbodies within the site and within 500m of the site boundary which are considered suitable for breeding amphibians (with terrestrial habitat connectivity to the site). No great crested newts were recorded during the

presence/absence surveys undertaken in 2012 and 2013. Great crested newts are not considered a constraint to development and are not addressed further in this chapter.

#### *Bats*

- 7.19 Bat roost sites were confirmed within a barn at Diglake Farm (single common pipistrelle), a bridge along the former railway line in the north (suspected small soprano pipistrelle maternity roost) and a bridge also along the former railway line in the south near to Diglake Farm (non-breeding common pipistrelle roost). See Appendix 3 for full details.
- 7.20 Bat foraging activity was largely concentrated along the former railway line and associated woodland and scrub which bisects the site north to south. Species recorded during the site surveys were common pipistrelle, soprano pipistrelle, noctule, serotine, *Myotis* and brown long-eared bat. No tree roosts were confirmed; however several trees with features suitable for bat roosting potential were recorded within the site.

#### *Breeding and Wintering Birds*

- 7.21 Several birds listed on the UKBAP, and birds of conservation concern (BoCC) were recorded within the site during both the breeding and wintering bird surveys. For full details please refer to Appendices 4 and 7.

#### *Barn Owl*

- 7.22 Barn owl were identified within the wider survey area, but were absent from the site.

#### *Invertebrates*

- 7.23 The Great Oak site was found to be significant as invertebrate habitat at a local level and possibly at district level. No protected invertebrates were recorded. For full details please refer to Appendix 5.

### *Reptiles*

- 7.24 During the site surveys the presence of common lizard was confirmed within the site.

### *Water Vole, Otter and White Clawed Crayfish*

- 7.25 No suitable habitat for water vole, otter or white clawed crayfish is present within the site and these species are not addressed further in this chapter.

### *Invasive Species*

- 7.26 Two areas of Japanese knotweed are located within the site boundary shown on drawing number ST12313-018 - Invasive Species Plan.

## **Nature Conservation Evaluation**

### ***Statutory Designated Sites***

- 7.27 In accordance with their designated status, Bradwell Woods LNR and Bateswood LNR are of **district importance** and Metallic Tileries Park House, a SSSI, is of **national importance**. The Midlands Meres and Mosses Ramsar site is of **international importance**.

### ***Non-Statutory Designated Sites***

#### *Non-Statutory Sites of Nature Conservation Designation*

- 7.28 The identified Sites of Biological Interest and Biodiversity Alert Sites (Table 5) are of **county importance**.

## **Habitats and Protected Species Evaluation**

### ***Habitats***

#### *Hedgerows*

- 7.29 The hedgerows within the site are species poor, often defunct with little or no notable ground flora and no associated undisturbed field margins. However, they do provide wildlife corridors and are listed within the Staffordshire BAP and UKBAP. Hedgerows are considered to be important within **the zone of influence only**.

### *Woodland*

- 7.30 The section of woodland (WB1) located along the former railway line is largely naturally regenerating woodland dominated by sycamore, hawthorn and silver birch. It is considered to be of low ecological value due to the relatively young age of the trees and the dominance of non-native sycamore which supports fewer insect species than native trees. The heavy shade cast by the tree canopy has also generally precluded the development of a rich ground flora. However, this section provides a wildlife corridor which links the north and south of the site, is part of Bignall End Coal Yards SBI and is listed within the Staffordshire BAP. It is therefore of importance at a **county level**.

### *Trees*

- 7.31 A total of 16 individual broadleaved trees, one broadleaved woodland (W1) and one group of broadleaved trees (G12) will be lost. Eleven are considered to be high value, six are considered to be medium value, including W1 and G12, and one is considered to be low value. The site is also covered by Tree Preservation Order Number 1. As such the trees within the site are considered to be important at a **local level**.

### *Standing Water and Ditches*

- 7.32 Two ponds (WB1 and WB5) and a ditch (WB27) will be lost. The ponds and ditch are considered to be of relatively low ecological value; WB1 is heavily stocked with fish with an associated high water turbidity and lower invertebrate diversity. WB5 is small, ephemeral and heavily shaded. Ponds are nonetheless listed within the SBAP as such they are important **within the zone of influence only**.

### *Other Habitats*

- 7.33 The improved grassland, ditches and scrub are considered to be of **negligible importance** for nature conservation. Improved grassland is dominated by lush grasses which preclude the establishment of a diverse floral range and the ditches on site are heavily grazed by cattle and seasonally dry. A small patch of marshy grassland will also be lost in the east of the site. The grassland is species poor, over grazed and heavily poached by cattle and as such is considered to be of **negligible**

**importance** for nature conservation. A small section of woodland along a ditch to the east of the site will also be lost. Due to the small size, fragmentation and poaching by cattle of this area, it is considered to be of **negligible importance**. A small section of semi-improved grassland in the east will be lost. The grassland is species poor and over grazed and is considered to be of **negligible importance**.

### ***Species***

#### *Badger*

- 7.34 Habitats within the site, including grassland and woodland were found to support individual setts and foraging badger. Badgers were also recorded within the wider survey area and are considered to inhabit similar habitats within the surrounding land. The site is therefore considered to be **important within the zone of influence for badgers**.

#### *Bats*

- 7.35 During the activity transects a high level of bat activity was recorded along the former railway line running north to south. Species recorded during the surveys were largely common species of bat such as pipistrelle and noctule, however serotine *Eptesicus serotinus* calls were recorded (a notable species within Staffordshire). Roosts were recorded for common and soprano pipistrelle, including a likely small maternity roost for soprano pipistrelle. All bat species are SBAP Priority species in the Urban section of the SBAP. The site is therefore considered to be **important at a local level for bats**.

#### *Wintering and Breeding Birds*

- 7.36 No confirmed breeding Schedule 1 species were recorded within the site; however a number of birds of conservation concern/UKBAP were recorded during both the wintering and breeding bird surveys. The survey area, as defined by the blue line (Appendices 4 and 7) was found to be of local importance for breeding and wintering birds, but the proposed development site itself, as defined by the red line is of relatively lower value for avifauna than the remainder of the survey area. As such the site is considered to be **important within the zone of influence for wintering and breeding birds**.

### *Barn Owl*

- 7.37 The survey area supports habitat considered suitable to support breeding and foraging barn owls (including grassland, buildings and mature trees); however, during the 2012 surveys no barn owls were recorded within the site. As such the site is considered to be **important within the zone of influence for barn owl**.

### *Reptiles*

- 7.38 The site is dominated by heavily grazed, improved grassland and woodland which are not suitable habitats for significant populations of reptiles. A single common lizard was recorded within an area of scrub in the east of the site. The woodland edge, scrub and habitats surrounding and including WB1 and also WB26 are considered to be suitable habitats for common lizards. The site is considered to be **important within the zone of influence only for reptiles** as a small population was found to be present.

### *Invertebrates*

- 7.39 The site was assessed as providing significant habitat at a local level and possibly at district level for invertebrates. However, even with further survey it is highly unlikely that the site would be shown to be of county significance or higher. No protected or species of conservation concern were recorded during the surveys and species richness was assessed as being relatively low for all taxonomic groups. The site is considered to be of **importance at the local level for invertebrates**.

## 8 IMPACT ASSESSMENT

- 8.1 Habitats that will be lost as a result of the development are semi-improved grassland, improved grassland, marshy grassland, scrub, trees, woodland and flowing and standing water. The proposed activities are also likely to impact upon badger, foraging and roosting bats, breeding and wintering birds including barn owl, reptiles and invertebrates. Impacts on these habitats and species are discussed below..
- 8.2 Opportunities to avoid impacts on ecology have been considered from the early stages of scheme design, including a significant reduction in site area so that it is limited to the east of Bignall End Road. An additional area of land to the west of Bignall End Road was initially considered, but the assessment undertaken identified that this area contained a significant number of mature trees that were rich in biodiversity as well as a significant number of field ponds, hedgerows and potentially valuable wetland areas. As a consequence the decision was taken to reduce the site footprint to remove this area from development.
- 8.3 The majority of the development area will be screened by topsoil mounds approximately 30m in width (within the site boundary). These mounds will create an area of land between the site works and adjacent habitat which will remain undisturbed between their construction and until the cessation of operations on site. This 'buffer zone' will minimise any impacts upon adjacent habitats outside of the site boundary. Where there is no proposed topsoil mound between the site boundary and adjacent habitats, areas of undisturbed habitat within the site boundary will act as a buffer zone. In the small areas where there are no proposed topsoil mounds and there is no undisturbed area as a retained buffer zone, the adjacent habitat is considered to be of low ecological value and as such no significant impacts are anticipated on habitats immediately adjacent to the site boundary.

### **Statutory Designated Sites**

- 8.4 No impacts are anticipated on statutory designated sites. A Habitat Regulations Assessment in relation to the Midlands Meres and Mosses Ramsar site is presented at the end of this chapter.

## Non-Statutory Designated Sites

- 8.5 Bignall End Coal Yards SBI is located within the development footprint, as shown on drawing number ST12313-006. The central section of the SBI is a woodland corridor which connects the north of the site to the south. The northern section outside the application site has been subject to some recent tree loss and this will change the nature of the habitat in this area. The central section of this SBI will be temporarily lost for the duration of the activities on site. The wildlife corridor is a significant feature for species which require connectivity between the north and south of the site, particularly foraging bats, though its botanical species assemblage is relatively poor. The most ecologically valuable habitats present within the SBI will be retained to the south of the site – consisting of broadleaved semi-natural woodland and a scrub/heath vegetation mosaic and the connectivity of the wildlife corridor will be reinstated and improved following restoration. The impact on Bignall End Coal Yards SBI is assessed as **certain moderately adverse impact at a county level, when considered without mitigation.**
- 8.6 Bignall End Lane BAS is located adjacent to west of the development. A 30m buffer zone will be created between the site and the SBI through the creation of screening topsoil mounds within the site boundary and as such no direct impacts are anticipated. This impact is assessed as **not significant.**
- 8.7 No impacts are anticipated on other non-statutory designated sites within 2km of the site.

## Site Preparation - Vegetation Clearance and Stripping

### *Habitats*

#### *Hedgerows*

- 8.8 The hedgerows within the development site are largely defunct and floristically species poor. Their limited functionality as wildlife corridors and bird nesting habitat will be lost temporarily for the duration of development. The loss of the hedgerows on site will result in **certain minor adverse impact at the local level, when considered without mitigation.**

### *Woodland*

- 8.9 The broadleaved woodland which is proposed to be lost through development is confined to the central section of Bignall End SBI. The woodland here is relatively young, dominated by sycamore and with a poor ground flora. Although the woodland species composition is poor, as a habitat it forms an important connection between the north and south of the site. When mitigation is not taken into account the loss of broadleaved woodland would result in a **certain moderately adverse impact at the county level.**

### *Trees*

- 8.10 Eleven trees of Category A retention value are proposed to be permanently lost to the development. These comprise largely of old, standard hedgerow oaks as well as smaller numbers of sycamores. The general lack of regeneration due to poor management of hedgerows, over-grazing and lack of new planting of field and hedgerow standard trees in the wider landscape means that there will be a cumulative impact resulting from the loss of these trees. When mitigation proposed is not taken into account the loss of individual trees (a total of sixteen), one tree group and one woodland will result in a **certain moderately adverse impact at a local level.**

### *Standing water and Ditches*

- 8.11 WB1 is a fishing pond with little submerged macrophytic vegetation. It is however a confirmed breeding pond for common toads – a SBAP species. WB5 is small, ephemeral and shaded with limited ecological value. Ditch WB27 is a small feature of limited ecological value. The loss of these ponds and ditch are temporary and reversible and as such when proposed mitigation is not taken into account will result in a **reversible moderately adverse impact within the zone of influence.**

### ***Protected Species***

#### *Badger*

- 8.12 The development will result in the loss of setts, displacement of individuals to surrounding land, increased collision risk with existing and proposed roadways, loss of foraging habitat and fragmentation of territories. When the mitigation proposed is

not taken into account loss of habitat and affect to badgers will have a certain **significant adverse impact within the zone of influence.**

#### *Bats*

- 8.13 No bat roosts will be lost as a result of development. The three confirmed roosts within the site are all over 30m from the boundary of the site and will be protected from disturbance by the topsoil mounds or undisturbed area shown on the phasing drawings.
- 8.14 The temporary loss of hedgerows, grassland areas, woodland and woodland edges will result in the reduction of commuting and foraging habitats for bats. No confirmed roosts will be affected by the development, however potential tree roosts that were not confirmed as roosts during survey work may be affected. Tree roosts are difficult to confirm due to their often sporadic use by bats. When the mitigation proposed is not taken into account the loss of foraging habitats and potential tree roosts is considered to **have a certain moderately adverse impact for bats at a local level.**

#### *Breeding and Wintering Birds*

- 8.15 The site supports several species of conservation concern as well as more widespread species. When the mitigation proposed is not taken into account the temporary loss of habitats supporting breeding and wintering birds is considered to have a **reversible moderately adverse impact within the zone of influence level**

#### *Barn Owl*

- 8.16 No evidence of barn owl was recorded on site during the 2012 surveys, although barn owl is known to inhabit the land to the west of the site. No known foraging habitat or roost sites will be lost; therefore the development will result in an impact which is **negligible at the zone of influence level.**

#### *Reptiles*

- 8.17 The development will result in the loss of reptile habitats and has the potential to harm individual reptiles. When the mitigation proposed is not taken into account this is considered to have a **probable moderately adverse impact at a local level.**

### *Invertebrates*

- 8.18 No legally protected species were recorded, nor was it anticipated that any significant population would be found on site. When the mitigation proposed is not taken into account the size of the area of habitat to be lost will result **probable moderately adverse impact at the local level.**

### **Construction Activities and Operational Phase**

- 8.19 Construction activities during the operational phase (and during site preparation) have the potential to harm/kills animals if present on site. Any excavations could pose a threat of entrapment, and machinery on site has the potential to result in collisions. Without the mitigation proposed, these activities have a **probable moderately adverse impact at a zone of influence to local level.**
- 8.20 Lighting has the potential to affect species such as badger, bats and birds, particularly around the edges of the development. Lighting within the site may displace these species. Without the mitigation proposed this is considered **probable minor adverse impact at a local level.**
- 8.21 During the operational phase (and site preparation) there will be vehicle movements within the site. This will increase noise and dust levels which could lead to the disturbance and displacement of species utilising the site. When the mitigation proposed is not taken into account this is considered to have a **probable minor adverse at a local level.**
- 8.22 During the operational phase the site will experience an increase in traffic levels and associate noise. It is therefore thought that the site will be subjected to increased disturbance levels. When the mitigation proposed is not taken into account the increase in traffic associated impacts is considered be **minor adverse at a local level.**
- 8.23 A summary of impacts on habitats and species is presented in Table 4 below.

**Table 4: Impact Assessment Summary**

<b>Habitats</b>					
	<b>Target Note</b>	<b>Approximate loss/Impact</b>	<b>Value</b>	<b>Gained through restoration</b>	<b>Net Loss/Gain</b>
<b>Broad-leaved woodland</b>	W1	Loss – 2.47ha	Staffordshire BAP habitat. Wildlife corridor. Site of Biological Interest (Bignall End Coal Yards).	5.0 Ha (of which 0.7 Ha would be advance planted outside application site in Year 1 of coaling)	1.3 Ha GAIN
<b>Wet woodland</b>	N/A	N/A	Staffordshire BAP habitat.	0.5 Ha	0.5 Ha GAIN
<b>Trees</b>	T89, T90, T91, T92, T93, T96, T97, T98, T99, T100, T101, T105, T106, T107, T110, T112 and G12	Loss – a total of 16 individual trees, and one group.	11 are considered to be of high value, 6 medium value, including G12, and 1 low value. Tree Preservation Order Number 1.	0	Loss – a total of 16 individual trees, and one group.

**Table 4: Impact Assessment Summary**

<b>Newly planted hedgerow trees</b>	N/A	N/A	Local value to the site, once matured these trees will provide habitat for a range of species and connective corridors for commuting species such as birds and bats.	280 No.	280 No. GAIN
<b>Hedgerows</b>	N/A	Loss – 2400m (linear)	Staffordshire BAP habitat. Wildlife corridor.	5700 linear m	330 linear m GAIN
<b>Improved grassland</b>	N/A	Loss – 68ha	No ecological value.	53 Ha	5 Ha LOSS
<b>Semi-improved grassland</b>	N/A	Loss – 4.3ha	No ecological value.	0	4.8 Ha LOSS
<b>Unimproved neutral grassland</b>	N/A	N/A	Staffordshire BAP habitat.	6.3 Ha	6.3 Ha GAIN
<b>Marshy grassland</b>	N/A	Loss – 0.15ha	Local value to the site.	0	LOSS – 0.15ha

**Table 4: Impact Assessment Summary**

<b>Table 4: Impact Assessment Summary</b>					
<b>Scrub</b>	N/A	Loss	No ecological value.	0	Net LOSS.
<b>Standing water</b>	WB1 and WB5	Loss – 2 ponds	Staffordshire BAP habitat.	1 large angling pond with 9 field ponds	7 No. GAIN
<b>Flowing water</b>	WB4, WB27, WB28	Loss – 3 ditches	Staffordshire BAP habitat.	1 ditch, numerous localised shallow areas and scrapes	Net GAIN.
<b>Species</b>					
	<b>Habitats of Value</b>	<b>Present</b>		<b>Impact Anticipated</b>	
<b>Badger</b>	Grassland, scrub, woodland and hedgerow.	Reside and forage.		Temporary loss of foraging habitats, dispersal of individuals, increased collision routes, displacement and territory fragmentation.	
<b>Bats</b>	Hedgerows, woodland, woodland edge, trees and scrub.	Roosting and foraging/commuting.		Temporary loss of foraging and commuting routes. No known roost sites to be disturbed.	
<b>Breeding and wintering birds</b>	Woodland, hedgerows, grassland, trees and scrub.	UKBAP and BoCC.		Temporary loss of foraging and breeding/over-wintering habitat.	
<b>Barn owl</b>	Grassland and mature trees.	Not confirmed within the site.		Negligible.	
<b>Reptiles</b>	Scrub, woodland edges and grassland.	Reptile hotspot areas.		Temporary loss of habitat.	
<b>Invertebrates</b>	Hedgerows, grassland, trees.	Locally important species.		Temporary loss of habitat.	

## 9 MITIGATION

### Statutory Designated Sites

- 9.1 There are no impacts on statutory designated sites and no mitigation is required (refer also to the Habitat Regulations Assessment at the end of this chapter).

### Non-Statutory Designated Sites

- 9.2 The following SBI and BAS sites occur within 500 metres of the site;
- Bignall End Road BAS is located immediately adjacent to the western boundary of the site, however it lies outside of the zone of impact and therefore will not be directly impacted by the development. The overall impact will therefore be negligible.
  - Sections of Bignall End Coal Yards SBI are located within the centre of the site and extend outside the site boundary to the north and south. Following initial development works it is intended to replant the affected areas with suitable native woodland plantings, to the north of the SBI additional woodland planting will provide a connective link to the wider environment benefitting species such as bats, in the short term the loss of woodland habitats will have a **certain minor adverse impact at the county level**, however following the **successful establishment of the mitigation works will result in a minor beneficial impact within the zone of influence**.

### Site Preparation - Vegetation Stripping and Clearance

#### *Hedgerows*

- 9.3 Upon completion of the proposed activities hedgerows will be re-planted, this is shown on drawing number 36/D03 – Restoration Plan. The hedgerows within the site are currently species poor with little or no ground flora. They consist largely of intensively managed and defunct hawthorn. Newly planted hedgerows will be species rich and will provide improved habitat connectivity across the site and surrounding habitats. With this mitigation in place, the loss of hedgerows will in the **short term have a probable minor adverse impact within the zone of influence but in the long term following the successful establishment of the mitigation works will result in a minor beneficial impact within the zone of influence**.

### ***Woodland***

- 9.4 The section of woodland along the former railway line will be reinstated. New areas of woodland planting are proposed which will strengthen and enhance existing woodland areas. With mitigation in place, the loss of this section of woodland will result in a **certain short term minor adverse impact at a local level but in the long-term following the establishment of mitigation works will result in a probable minor beneficial impact at the local level.**

### ***Trees***

- 9.5 In total sixteen individual trees, one area of woodland and one tree block (of high, medium and low value) will be lost. Upon completion of the proposed activities, native tree species will be planted within the re-instated hedgerow boundaries (see plan 36/D03 – Restoration Plan) to improve habitat connectivity within the site and surrounding habitat. With mitigation in place, the loss of trees will have a **certain short term minor adverse impact within the zone of influence but in the long term following establishment of planted trees will result in a probable minor beneficial impact within the zone of influence.**

### ***Standing Water and Ditches***

- 9.6 The two ponds and ditches which will be lost as a result of the proposed development will be re-instated and in addition eight ponds will be created. With the proposed mitigation in place, the creation of an additional 7 new field ponds and re-instatement of the watercourse will provide opportunities for a range of fauna and flora and as such **in the short-term and long-term will result in a certain moderately beneficial impact within the zone of influence.**

### ***Protected Species***

#### ***Badger***

- 9.7 Due to the sensitive nature of information in relation to badger setts a confidential badger annexe that includes details of the proposed mitigation strategy will be included with the ES.

### *Bats*

- 9.8 The development will result in the temporary loss of foraging and commuting habitat for bats. No confirmed bat roosts will be affected by the proposals due to the implementation of buffer zones between the site and confirmed roosts. However, trees with bat roosting potential were recorded and surveyed on site and although no roosts were confirmed to be present, trees may support opportunistic roosting bats. Prior to felling or alteration of any of the trees within the site suitable to support roosting bats, a detailed inspection survey will be undertaken to determine presence/absence of bats. Should a bat roost be confirmed to be present, an appropriate mitigation strategy will be prepared and a licence obtained from Natural England. Should a mitigation site be required for bats, it will be located to the west of Bignall End Lane by agreement of the landowner.
- 9.9 The restoration proposals include the restoration of existing site habitats and the creation of new foraging areas in the form of hedgerows and ponds. With mitigation in place, the **probable** impact on bats is assessed as being **short-term minor adverse at a local level but in the long term following establishment of the mitigation measures will have a probable minor beneficial impact at the local level.**

### *Breeding and Wintering Birds*

- 9.10 All vegetation clearance will be undertaken outside of the breeding bird season (March to August inclusive). Given that the majority of the habitats considered to be of most value to breeding and wintering birds is located outside of the site boundary, with mitigation in place the **probable** impact is anticipated to be **minor adverse within the zone of influence in the short term but will be minor beneficial in the long term following establishment of proposed planting and mitigation measures within the zone of influence.**

### *Barn owl*

- 9.11 No confirmed roosts or foraging habitat will be affected by the proposals. However, as a precautionary approach, detailed inspection of all mature trees within the site with the potential to support roosting/breeding barn owl will be undertaken prior to removal. Should a roost or nest site be found then an appropriate mitigation strategy will be prepared and guidance obtained from Natural England. Should a mitigation site be required it will be located within the wider survey area (within land

controlled by UK Coal Surface Mines Limited). **As this species would not be affected the magnitude of impact would be no change, resulting in a neutral significance of effect.**

### *Reptiles*

- 9.12 A destructive hand search of the site will be undertaken by an ecologist (no machinery will be used during this process) and all suitable reptile refugia will be translocated from the development area to suitable off-site locations.
- 9.13 Passive dissuasion techniques will be adopted from all grassland areas (suitable to support reptiles) prior to the onset of construction activities. Passive dissuasion involves the gradual manipulation of habitats under ecological supervision to dissuade reptiles onto adjacent land, and includes the following protocol:
- Strimming the grassland habitats in 3 staged passes, the first to reduce sward height to no less than 300mm working away from the centre of the construction area;
  - The second pass to be timed to occur 2 days after the initial vegetation clearance and further reducing the vegetation height from 300mm to 100mm;
  - The third and final pass to remove all vegetation from the construction area, leaving bare earth or extremely short turf so no cover of viable reptile habitat remains; and
  - To regularly (at least weekly) maintain a very short (less than 50mm) sward to discourage reptiles from recolonising the construction area from adjacent habitat.
- 9.14 All of the above should be undertaken under the direct supervision of the Ecological Clerk of Works (ECoW), and can only be undertaken during the appropriate time of year when reptiles would be anticipated to be active i.e. (May-September inclusive) and during good weather conditions i.e. no rain, light winds and temperatures of at least 15 degrees Celsius.
- 9.15 The restoration plan includes extensive areas of reptile habitat such as woodland edge and established grasslands. With this mitigation in place the impact of the development on reptiles is assessed as **not significant**.

### *Invertebrates*

- 9.16 The development will result in the temporary loss of invertebrate habitat through site clearance and excavation works. This is anticipated to result in a **certain minor adverse impact within the zone of influence in the short-term**. Invertebrate habitats will be re-instated as part of the restoration scheme.
- 9.17 Creating an open mosaic of habitats across the site that will include basking areas, food plants and nectar rich habitats will benefit a range of invertebrate species, connecting different habitats through hedgerow and grassland planting will encourage insects to move across the site and seek out individual niches, new ponds will create habitat for a range of aquatic and terrestrial invertebrates who may rely on aquatic habitat at different life stages. The proposed mitigation works have a **probable minor beneficial impact in the long-term for invertebrates within the zone of influence**.

### *Other notable/BAP Priority species*

- 9.18 The development will result in the temporary loss of two ponds which are amphibian breeding habitat. The common toad is a SBAP Priority species and the temporary loss of breeding habitat will result in a **probable minor adverse impact within the zone of influence in the short-term**. In the long term the creation and establishment of eight new ponds **will result in a certain moderately beneficial impact to common toads and other amphibians**.

### *Invasive species*

- 9.19 Japanese knotweed is located within the site. This species is listed under Schedule 9 of the Wildlife and Countryside Act 1981 (as amended). As such it is an offence to 'plant or otherwise cause to grow' species listed under Schedule 9 in the wild. This includes spreading of the species or transferring polluted ground material from one area to another. Should development occur within 10m of a known stand of Japanese knotweed then a mitigation/eradication strategy will be required to comply with current legislation.

### Construction Activities and Operational Phase

- 9.20 Site preparation and construction activities have the potential to harm/kill animals within the site. Any excavations could pose a threat of entrapment and machinery on site could result in collisions. All excavations will be suitably fenced and a means of escape provided for the duration of the operational phase. With mitigation this is assessed as **not significant**.
- 9.21 Site working will be undertaken during daylight hours, however, if this is not possible then low level or directional lighting to minimise light spill, particularly from the edge of the working area. The residual impact from lighting is considered to be **not significant**.
- 9.22 All vehicle movements will cease upon the end of daylight hours. This will reduce the risk of collision by foraging badger and other fauna. This impact is assessed as **not significant**.
- 9.23 Best practice will be carried out during the operational phase to address potential noise and pollution issues arising from the operational phase. The impact is assessed as **not significant**.

## 10 CUMULATIVE IMPACT

- 10.1 There are no other developments in the vicinity of the site which are likely to give rise to cumulative impacts.

### **Habitat Regulations Assessment (HRA)**

- 10.2 The key feature of the development which is considered to have potential for significant effects on the European sites is the drawdown of ground water associated with surface mining development. The hydrogeology and hydrology sections of Environmental Statement present an assessment of the potential effects of the development (on surface) and ground water. It concludes that there would be localised drawdown of ground water in the immediate vicinity of the development but this would not extend outside of the development boundary. Mitigation measures, such as settling lagoons and controlled discharge into watercourses will ensure that there will be no adverse impact upon water quality and flooding. No significantly adverse impacts in terms of hydrogeology and hydrology are anticipated as a result of the development.
- 10.3 It is concluded that there would be no significant effect on the Midlands Meres and Mosses Ramsar Phase 1 and 2 sites and no Appropriate Assessment is required.

### **Water Framework Directive Assessment**

- 10.4 Mitigation measures, such as settling lagoons and controlled discharge into watercourses will ensure that there will be no adverse impact upon the existing and future chemical status of the sites catchment (classified as “good”). Restoration of the site following development has potential to increase biodiversity and current ecological status which is currently defined as “poor”.
- 10.5 No significantly adverse impacts in terms of hydrogeology are expected as a result of the development. There will be no adverse impact on flood risk and water quality in the surrounding and downstream water environment during the operation of the scheme or following restoration.
- 10.6 Overall it is considered that the development will not cause deterioration in the ecological status of any waterbodies and would not compromise the Water Framework Directive status objectives.

### **Restoration Proposals, Habitat Management and Monitoring**

- 10.7 A Restoration Plan for the site has been prepared shown on drawing number 36/D03.

## **11 SUMMARY AND CONCLUSIONS**

- 11.1 This ecological assessment has identified and evaluated the elements that make-up the local ecosystems and has considered how the impacts of the development may affect each of these in accordance with NPPF and the IEEM Guidelines for Ecological Impact Assessment (2006). A summary of the impacts in the absence of mitigation is provided in Table 5 below along with a summary of the residual impacts following mitigation.
- 11.2 Survey and consultation on ecology and nature conservation has been undertaken from the early stages of the proposed development. This work has allowed the compilation of a baseline that comprehensively characterises the ecological conditions within the site and adjacent areas.
- 11.3 The application site has been assessed and does not affect the nature conservation of a site of national or international importance.
- 11.4 In terms of protected and notable species the proposal will result in the short term loss of habitats giving rise to a degree of displacement of some groups, including breeding and over-wintering birds and badgers. Such impacts could though be minimised by the implementation of a scheme of mitigation measures which could be secured by the imposition of planning conditions. Given the relatively short period of working therefore and long term benefits that will be brought by the restoration proposals, the potential impacts are likely to be short-term and not likely to significantly affect local populations.
- 11.5 In the light of the above it is considered that the proposal will not affect important sites of nature conservation value or cause significant disturbance to protected species or important local designations. Residual negative impacts could be mitigated by a scheme of mitigation measures to ensure that potential impacts do not come close to the thresholds of unacceptability. The restoration benefits will bring a number of positive ecological enhancements which further offsets the overall negative impacts in the long term. The proposal is therefore considered compliant with Development Plan policy and national planning guidance.

**Table 5 – Summary of the proposed impact upon ecological features of the site**

Feature	Impact without mitigation during site clearance	Impact without mitigation during construction and operation	Mitigation measures	Impact following inclusion of mitigation measures	Residual impact
				Short-term	Long-term
Bignall End Coal Yards SBI	Certain moderately adverse impact at the county level.	Certain minor adverse impact at the county level.	Habitat replacement planting to include suitable species of local provenance where possible.	Certain minor adverse impact at county level.	Probable minor beneficial impact at county level.
Hedgerows	Minor adverse impact at the local level.	Minor adverse impact at the local level.	Replacement hedgerow planting using a suitable mix of trees and shrubs.	Probable minor adverse impact within the zone of influence.	Probable minor beneficial within the zone of influence.
Woodland	Certain moderately adverse impact at the county level.	Certain minor adverse impact at the local level.	Replacement planting to occur in suitable areas, this will include native species of local provenance where possible.	Certain minor adverse impact at the local level.	Probable minor beneficial impact at the local level.
Mature Trees	Certain moderately adverse impact at the local level.	Certain minor adverse impact at the local level.	Native tree species to be replanted across the site.	Certain minor adverse impact within the zone of influence.	Probable minor beneficial impact within the zone of influence
Standing water and ditches	Certain moderately adverse impact within the zone of influence.	Probable minor adverse impact within the zone of influence.	Creation of eight new ponds across the site.	Certain moderately beneficial impact within the zone of influence.	Certain moderately beneficial impact within the zone of influence.
Badger	Certain significant adverse impact within the zone of influence.	Certain significant adverse impact within the zone of influence.	See badger report.	See badger report.	See badger report.

**Table 5 – Summary of the proposed impact upon ecological features of the site**

Feature	Impact without mitigation during site clearance	Impact without mitigation during construction and operation	Mitigation measures	Impact following inclusion of mitigation measures	Residual impact
				Short-term	Long-term
Bats	Certain moderately adverse impact at the local level.	Probable moderately adverse impact at the local level.	Inspection to be carried out on suitable roost areas such as mature trees prior to removal. Combined mitigation planting will provide a range of new habitats such as hedgerows, woodlands and ponds.	Probable minor adverse impact at a local level.	Probable minor beneficial impact at a local level.
Birds	Probable moderately adverse impact within the zone of influence.	Probable moderately adverse impact within the zone of influence.	Vegetation clearing to avoid the main bird nesting season (March to August inclusive). Combined mitigation planting will provide a range of alternative habitats for birds.	Probable minor adverse within the zone of influence.	Probable minor beneficial impact within the zone of influence.
Reptile	Probable moderately adverse impact within at a local level.	Probable minor adverse impact at a local level.	Reasonable avoidance measures to be incorporated into any vegetation clearance activities under ECoW supervision. Habitat planting will include reptile habitats such as grassland and woodland.	Neutral.	Neutral.

**Table 5 – Summary of the proposed impact upon ecological features of the site**

Feature	Impact without mitigation during site clearance	Impact without mitigation during construction and operation	Mitigation measures	Impact following inclusion of mitigation measures	Residual impact
				Short-term	Long-term
Invertebrates	Minor adverse.	Minor adverse.	Replacement habitat planting will include habitats utilised by a range of invertebrate species.	Probable minor adverse impact within the zone of influence.	Probable minor beneficial impact within the zone of influence.

## 12 REFERENCES

- 12.1 Bat Surveys: Good Practice Guidelines, Bat Conservation Trust. Hundt, L., 2012
- 12.2 The Bat Workers' Manual, JNCC, 2004
- 12.3 Biodiversity: The UK Action Plan, DOE, 1994
- 12.4 Great Crested Newt Mitigation Guidelines, English Nature, 2001
- 12.5 Guidelines for Baseline Ecological Assessment, Institute for Environmental Assessment, 1995
- 12.6 Guidelines for Ecological Impact Assessment, Institute for Ecology and Environmental Management, 2006
- 12.7 The Handbook for Phase 1 Habitat Survey – a Technique for Environmental Audit, JNCC, 2010
- 12.8 Herpetofauna Workers' Manual, Gent & Gibson, 2003
- 12.9 A Nature Conservation Review, Ratcliffe, 1977
- 12.10 New Flora of the British Isles, 2nd Edition, Stace, C., 1997

STOKE-ON-TRENT  
Sir Henry Doulton House  
Forge Lane  
Etruria  
Stoke-on-Trent  
ST1 5BD  
Tel: +44 (0)845 111 7777

CARDIFF  
22 Windsor Place  
Cardiff  
CF10 3BY  
Tel: +44 (0)29 2072 9191

EDINBURGH  
Suite 2/3, Great Michael House  
14 Links Place  
Edinburgh  
EH6 7EZ  
Tel: +44 (0)131 555 3311

GREATER MANCHESTER  
2 The Avenue  
Leigh  
Greater Manchester  
WN7 1ES  
Tel: +44 (0)1942 260101

LONDON  
Third Floor  
46 Chancery Lane  
London  
WC2A 1JE  
Tel: +44 (0)20 7242 3243

NEWCASTLE UPON TYNE  
City Quadrant  
11 Waterloo Square  
Newcastle upon Tyne  
NE1 4DP  
Tel: +44 (0)191 232 0943

PENRYN  
Tremough Innovation Centre  
Tremough Campus  
Penryn  
Cornwall  
TR10 9TA  
Tel: +44 (0)1872 560738

SHEFFIELD  
Unit 5  
Newton Business Centre  
Newton Chambers Road  
Thorncliffe Park  
Chapelton  
Sheffield  
S35 2PH  
Tel: +44 (0)114 245 6244

TRURO  
Wheal Jane  
Baldhu  
Truro  
Cornwall  
TR3 6EH  
Tel: +44 (0)1872 560738

WEST BROMWICH  
Thynne Court  
Thynne Street  
West Bromwich  
West Midlands  
B70 6PH  
Tel: +44 (0)121 580 0909

International offices:

ALMATY  
29/6 Satpaev Avenue  
Rakhat Palace Hotel  
Office Tower, 7th Floor  
Almaty  
050040  
Kazakhstan  
Tel : +7-727-3341310

MOSCOW  
Suite 2, Block 10,  
Letnikovskaya St.  
Moscow, Russia  
115114  
Tel: +7(495) 980 07 67

Wardell Armstrong Archaeology:

CUMBRIA  
Cocklakes Yard  
Carlisle  
Cumbria  
CA4 0BQ  
Tel: +44 (0)1228 564820