12 Ecology and Nature Conservation

12.1 INTRODUCTION

12.1.1 This chapter assesses the impact of the Proposed Development on the identified ecological and nature conservation features of the Site and the surrounding area based upon desk study consultations and field surveys. In particular it considers the potential impacts of the Proposed Development on habitats and protected and notable species.

12.1.2 The assessment has been undertaken in accordance with the Institute of Ecology and Environmental Management (IEEM) *Guidelines for Ecological Impact Assessment in the United Kingdom* (2006) (Ref 12.1). These guidelines are widely used nationally for the production of ecological impact assessments.

12.1.3 The existing ecological potential of the Site and the surrounding area has been reviewed and the character and nature conservation value of the habitats and the potential for protected and notable species assessed. Potential impacts to flora and fauna of the Proposed Development are outlined. Where appropriate, measures to enhance, prevent, minimise or control those impacts are presented and residual impacts following the adoption of those measures are assessed.

12.1.4 This chapter (and its associated figures and appendices) is not intended to be read as a stand alone assessment and reference should be made to the Front End of this ES (**Chapters 1 – 5**), as well as **Chapter 16 'Cumulative Effects'**.

12.2 LEGISLATION, POLICY AND GUIDANCE

Legislation

12.2.1 The applicable legislative framework is summarised below. More detailed explanations of these international and national obligations and objectives are included in **Appendix 12.1**:

- Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora (EC Habitats Directive) (Ref. 12.2);
- Council Directive 79/409/EEC on the Conservation of wild birds (EC Birds Directive) (Ref. 12.3);
- The Conservation of Habitats and Species Regulations 2010 (Ref. 12.4);
- The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention) 1979 (Ref. 12.5);
- The Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) 1983 (Ref. 12.6);
- Convention on Biological Diversity 1992 (Ref. 12.7);
- The Wildlife and Countryside Act 1981 (WCA) (Ref. 12.8);
- The Countryside and Rights of Way Act 2000 (CRoW) (Ref. 12.9); and
- Natural Environment and Rural Communities Act 2006 (NERC) (Ref. 12.10).

Statutorily Protected Sites

12.2.2 Local Nature Reserves (LNRs); National Nature Reserves (NNRs); Ramsar sites; Sites of Special Scientific Interest (SSSIs); Special Areas of Conservation (SAC); and Special Protection Areas (SPAs) contain examples of some of the most important natural and semi-natural ecosystems in Europe and receive strict protection under both United Kingdom (UK) and European legislation.

Non-Statutory Sites

12.2.3 Natural Heritage Sites (NHS) receive protection through the Barnsley Core Strategy (BCS) (Ref. 12.12).

Protected Species

12.2.4 Under European and UK legislation, a number of species and their habitats, including bats (*Chiroptera)* are strictly protected from damage, disturbance and destruction etc. Certain species such as some reptiles and birds receive partial protection under UK legislation, e.g. protection from killing/injuring only or protection at certain times of the year only.

Invasive weeds

12.2.5 The WCA 1981 makes it an offence to plant or otherwise cause to grow in the wild species listed on Schedule 9 of the act, including Japanese knotweed (*Fallopia japonica*), Himalayan balsam (*Impatiens glandulifera*) and giant hogweed (*Heracleum mantegazzianum*).

Policy

12.2.6 Planning policy at the national, county and local level is discussed in **Chapter 5 - Planning Policy Context.** Those policies relevant to ecology and nature conservation are discussed briefly below.. A summary of the scheme's compliance with legislation and planning policy is included in Section 12.6 of this chapter.

National Planning Policy

National Planning Policy Framework (NPPF)

12.2.7 Published in March 2012, the NPFF (**Ref 12.13**) sets out the Government's planning policies for England and supersedes a number of previous Planning Policy Guidance (PPG) Notes and Planning Policy Statements (PPS) (amongst other documents), including PPS 9: Biodiversity and Geological Conservation (Office of the Deputy Prime Minister (ODPM), 2005) (**Ref 12.14**).

12.2.8 Whilst PPS 9 has been made redundant, .Circular 06/05 (ODPM, 2005) (**Ref. 12.15**) remains an active document.

12.2.9 The NPPF states that to:

"*Encourage the effective use of land by reusing land that has been previously developed (brownfield land), provided that it is not of high environmental value*"

12.2.10 In addition to this:

"*Development proposals where the primary objective is to conserve or enhance biodiversity should be permitted*" and "*opportunities to incorporate biodiversity in and around developments should be encouraged*". Also, the "*presumption in favour of sustainable development does not apply where development requiring appropriate assessment under the Birds or Habitats Directives is being considered, planned or determined*"

12.2.11 The NPPF encourages planning policies to:

"*Minimise impacts on biodiversity and geodiversity by identifying and mapping components of the local ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity, wildlife corridors and stepping stones that connect them and areas identified by local partnerships for habitat restoration or creation*"

PPS 9

12.2.12 Whilst PPS 9 has been superseded by the NPPF, in the absence of more detailed technical guidance and to provide further context for this assessment, reference has been made to PPS 9, which is summarised below.

12.2.13 PPS 9 and accompanying Circular 06/05 (ODPM, 2005) states what is required at regional and local levels to ensure that decisions are made that consider:

- The retention of existing natural features;
- The incorporation of wildlife value into the built environment; and
- The adequate implementation of mitigation measures to compensate for significant impacts.

12.2.14 Further details regarding PPS9 are provided in **Appendix 12.1.**

Local Planning Policy

Barnsley Core Strategy

12.2.15 The BCS provides a spatial strategy for the future development of Barnsley up to the year 2026. The Core Strategy sets out the key elements of the planning framework for Barnsley, and the approach to its long term physical development. The BCS went through a process of public consultation between February and April 2010.

12.2.16 Within the BCS the following policies are relevant to the assessment:

- CSP 33 – Green Infrastructure;
- CSP 34 – Protection of Green Belt;
- CSP 35 – Green Space; and
- CSP 36 – Biodiversity and Geodiversity.

12.2.17 Full details of the policy outlined above are provided in **Appendix 12.1**.

Guidance

12.2.18 The Barnsley Biodiversity Action Plan (BBAP) (Ref 12.16) is intended to provide a sound basis for local action to conserve, protect and enhance the biodiversity of the borough. The BBAP identifies those species and habitats which have particular significance in Barnsley and outlines the objectives, targets and actions considered necessary to protect and enhance the wildlife of the Barnsley area until 2012.

12.2.19 The BBAP contains a number of Habitat and Species Action Plans relevant to the proposed development, including bats, otters and rivers.

12.3 ASSESSMENT METHODOLOGY AND SIGNIFICANCE CRITERIA

Study Area

12.3.1 Species data for the desk study were requested within a 2 kilometre (km) radius of the Site, as recommended in the Institute of Environmental Management and Assessment's (IEMA's) Guidelines for Baseline Ecological Assessment (1997) (Ref. 12.17).

12.3.2 As part of the assessment, an initial ecological walkover survey of the Site was undertaken in April 2011 by a suitably qualified ecologist from WSPE&E. An Extended Phase 1 Habitat survey (**Appendix 12.2** and **Figure 12.1**) was carried out within the Site boundary in April 2011 by Matt Oakley, Senior Ecologist with WSPE&E and member of the IEEM. Surveys for bats, water vole (*Arvicola amphibius*) and otter (*Lutra lutra*) were undertaken between July and August 2011, the exact details of which are provided within **Appendix 12.1**.

Ecological Zone of Influence

12.3.3 The Ecological Zone of Influence (EZoI) is an area defined by the assessment in which there may be receptors subject to impact as part of the Proposed Development. Such receptors are likely to include designated sites, notable habitats and protected species, and these could be affected directly, e.g. works affecting a receptor within the Site such as removal of a building occupied by bats, or indirectly, e.g. a designated site downriver of a development being affected by sediment deposition, etc.

12.3.4 The EZoI was determined through:

- A review of the existing conditions in comparison with scheme designs and construction information;
- Consideration of the proposed activities (during site preparation, construction and operation);
- The desk study information including an examination of mapping data;
- Responses from consultees and records of protected species;
- Findings of the site survey work; and

- Through liaison with other specialists involved in assessing the impacts in other interrelated disciplines, such as lighting and noise.

12.3.5 The EZoI is defined as the areas/resources that may be affected by the biophysical changes caused by activities associated with the project, which includes all land within the Site boundary and a buffer 100m upstream of the Site and 500m downstream of the Site to include potential impacts to the River Dearne. Consultation

12.3.6 Information was requested from the statutory and non-statutory organisations listed below.

- Yorkshire Wildlife Trust (YWT);
- Barnsley Metropolitan Borough Council (BMBC);
- South Yorkshire Bat Group (SYBG); and
- The Environment Agency (EA).

12.3.7 A summary of their responses is provided below in **Table 12.1**:

Table 12.1: Summary of Consultation Responses

Consultee	Summary of Response
YWT	Confirmed that YWT does not hold any species records for the Site and that WSP should contact the local Biodiversity Officer (Trevor Mayne). The YWT supplied details of their *Wildlife on the Waterways* project in close proximity to the Site, which aims to protect populations of water vole in the Dearne Valley.
BMBC	BMBC provided the same comments as the EA (see below). Trevor Mayne, Biodiversity Officer for BMBC provided details on white-clawed crayfish surveys undertaken on the River Dearne in 2010. Trevor also supplied details on locally designated sites, as well as details on the Daubentons bat (*Myotis daubentonii*) roost in the Site including previous survey work undertaken by Eric Bennett on behalf of the council.
SYBG	Provided details of bats and bat roosts within 5km of the Site.
EA	The EA confirmed the existence of a significant Daubentons bat roost within the Site which is one of the biggest in Yorkshire. They commented that Natural England must be consulted if there is likely to be any impact on this roost, and it is they who will determine the precise level of protection and mitigation for this roost. Whilst it is not within their remit to comment on bats specifically, the EA made the following general comments: - An updated 2011 bat survey should be undertaken immediately (July - August); - The integrity of the culvert should be maintained in its current form from the location of the roost to the culvert entrance; - The lighting scheme for the development should be carefully designed so that there is no additional illumination of the culvert entrance or the river or river edge along the entire development site; - There must be no public access to the river bank within 30m of the culvert entrance; and - There should be an 8m buffer zone along the watercourse where no development shall take place. Where this buffer zone does not

currently exist, the riparian corridor should be improved via fencing and the planting of a range of native tree and shrub species which will also benefit other species.

Method of Baseline Data Collation

Desk Study

12.3.8 The purpose of the desk study was to review existing information available in the public domain and to obtain information held by statutory and non-statutory consultees.

12.3.9 The following metadatabases were searched for protected habitats and species:

- Multi-agency Geographic Information for the Countryside (MAGIC) website – www.magic.gov.uk;
- National Biodiversity Network website – http://www.searchnbn.net; and
- Nature on the Map – http://www.natureonthemap.org.uk.

12.3.10 In addition to the consultation process, the following literature was reviewed:

- BBAP; and
- UK BAP.

Site Visit / Other Assessment

12.3.11 The Extended Phase 1 Habitat survey of the Site was conducted on 8th April 2011, by Matt Oakley, a Senior Ecologist of WSPE. This survey details the habitats present, based on their plant species composition, and classified according to Phase 1 methodology (Joint Nature Conservancy Council, (JNCC) 2007) (Ref. 12.18). The survey was extended to include the assessment of these habitats for their potential to support protected species and to look for evidence of such species. The timing of the survey was suitable for this type of ecological work, as most plant species likely to be present on the Site are recognisable at this time of year. The desk study, on the other hand provides records of species that may not be present at the time of survey.

12.3.12 The potential presence of protected and rare or notable species was considered. Due to the types of habitats present, particular consideration was given to evidence of bats, otter, water vole and birds. Any invasive species present were also noted.

12.3.13 Whilst undertaking the Extended Phase 1 Habitat survey, external assessments were made of trees within the Site boundary to inform the likelihood of the presence of roosting bats.

12.3.14 Following the results of the Extended Phase 1 Habitat survey, with regard to the suitable habitat present and the potential constraints within the Site, additional bat emergence and activity surveys, otter, and water vole surveys have been undertaken during the suitable optimal survey periods for each species during the period July to August 2011.

12.3.15 Full information relating to the methodology and results of these surveys can be found within **Appendix 12.1**.

Scope and Method of Assessment

12.3.16 WSPE&E received advice from statutory and non-statutory consultees regarding the scope of the required assessment. These are discussed in **Chapter 4 Environmental Impact Assessment Methods**. In general, however, the scope of assessment included the collection of baseline data through document and data review and a desk study, together with survey work, in order to determine the impact of the Proposed Development on habitats and protected species both on-site and adjacent to the Proposed Development during both the construction and operational phases.

12.3.17 In particular it was advised that due to the presence of a Daubentons bat roost of at least County significance within a culvert in the west of the Site adjacent to Old Mill Lane, bat emergence and activity surveys should be undertaken during the optimal survey period to assess the potential impacts of the Proposed Development to the roost and the bats.

12.3.18 The following potential effects of the Proposed Development on the ecological and nature conservation features of the EZoI will be assessed in accordance with the IEEM guidelines for ecological impact assessment.

12.3.19 The scope of the assessment for ecology and nature conservation can be summarised as follows:

Construction

- Potential disturbance to roosting, foraging and commuting bats;
- Potential pollution and contamination of the River Dearne;
- Potential disturbance to foraging and commuting otters; and
- Potential impacts from invasive weeds.

Operation

- Potential disturbance to roosting, foraging and commuting bats;
- Potential disturbance of foraging and commuting otters; and
- Positive contributions towards long-term biodiversity gain.

Excluded Features

12.3.20 The following effects have been scoped out of the further assessment:

- Impacts to the Dearne Valley Park LNR have been scoped out. There will be no direct land take of the LNR as a result of the Proposed Development;
- Due to the negative results returned from the 2011 water vole presence/absence surveys of the Site (**Appendix 12.1**), this species has been excluded from further consideration within the assessment; and
- Following the initial Site visit and further consultation with the BMBC Biodiversity Officer, potential impacts to white-clawed crayfish (*Austropotamobius pallipes*) have been scoped out of the further assessment. Trevor Mayne supplied details of white-clawed crayfish surveys that were undertaken by the county recorder in 2010 of the River Dearne at both the Site, and upstream and downstream of the Site (see **Appendix 12.3**). No white-clawed crayfish were recorded during these surveys, and combined with the fact that signal crayfish have been recorded within the River Dearne, and the history of pollution within the River Dearne, white-clawed crayfish are not thought to be present within the River Dearne in Barnsley.

Impact Assessment

12.3.21 The assessment of the impacts of the Proposed Development follows the IEEM guidelines (2006). These guidelines are widely used nationally for the production of ecological impact assessments.

12.3.22 In order to assess the significance of the different magnitudes of impacts resulting from the Proposed Development, the value of any ecological feature that would be significantly affected is used to identify the geographical scale at which the impact would be significant.

12.3.23 The value or potential value of an ecological resource is determined within a defined geographical context using the following criteria as detailed below in Table 12.2:

- International;
- UK;
- National;
- Regional;
- County;
- District;
- Local; or
- Site.

Table 12.2: Criteria for Evaluation of Ecological Receptors

Value/Importance	Criteria
International (*European*)	**Habitats** An internationally designated Site or candidate Site (Special Protection Area [SPA]), provisional SPA, Special Areas of Conservation (SAC), candidate SAC, Ramsar Site, Biogenetic/Biosphere Reserve, World Heritage Site or an area that would meet the published selection criteria for designation. A viable area of a habitat type listed in Annex I of the Habitats Directive, or smaller areas of such habitat, which are essential to maintain the viability of a larger whole. **Species** Any regularly occurring population of internationally important species, threatened or rare in the UK (i.e. a UK Red Data Book species categories 1& 2 of UK BAP) or, of uncertain conservation status or, of global conservation concern *in* the UK BAP. A regularly occurring, nationally significant population/number of an internationally important species.
National (*England*)	**Habitats** A nationally designated Site (Site of Special Scientific Interest [SSSI], National Nature Reserve [NNR], Marine Nature Reserve [MNR] or a discrete area), which would meet the published selection criteria for national designation (e.g. SSSI selection guidelines). A viable area of a priority habitat identified in the UK BAP or, of smaller areas of such habitat essential to maintain wider viability. **Species** A regularly occurring, regionally or county significant population/number of an internationally/nationally important species. Any regularly occurring population of a nationally important species, threatened or rare in the region or county (see local BAP). A feature identified as of critical importance in the UK BAP.
Regional *(Yorkshire and Humber)*	**Habitats** Sites that exceed County-level designations, but fall short of SSSI selection criteria. Viable areas of key habitat identified in the Regional BAP or, smaller areas of habitat essential to maintain wider viability. **Species** Any regularly occurring, locally significant population of a species listed as being nationally scarce, which occurs in 16 of 100 10km^2 squares in the UK or in a Regional BAP. A regularly occurring, locally significant population/number of a regionally important species. Sites maintaining populations of internationally/nationally important species that are not threatened or rare in the region or county.
Authority Area (e.g. County or District) (South Yorkshire)	**Habitats** Sites recognised by local authorities, e.g. Natural Heritage Sites (NHS). County/District Sites that the designating authority has determined meet the published ecological selection criteria for designation, including Local Nature Reserves (LNR). A viable area of habitat identified in County/District BAP. A diverse and/or ecologically valuable hedgerow network. Semi-natural ancient woodland greater than 0.25ha. **Species** Any regularly occurring, locally significant population of a species listed in a County/District BAP due to regional rarity or localisation. A regularly occurring, locally significant population of a County/District important species. Sites supporting populations of internationally/nationally/regionally important species that are not threatened or rare in the region or county, and not integral to maintaining those populations. Sites/features scarce in the County/District or that appreciably enrich the County/District habitat resource.
Local *(Barnsley)*	**Habitats** Areas of habitat that appreciably enrich the local habitat resource (e.g. species-rich hedgerows, ponds etc). Sites that retain other elements of semi-natural vegetation that due to their size, quality or the wide distribution within the local area are not considered for the above classifications. Semi-natural ancient woodland smaller than 0.25 ha. **Species** Populations/assemblages of species that appreciable enrich the biodiversity resource within the local context. Sites supporting populations of county/district important species that are not threatened or rare in the region or county, and are not integral to maintaining those populations.
Site level (*Limited ecological importance*)	Sites that retain habitats and/or species of limited ecological importance due to their size, species composition or other factors.

Assigning a Threshold Value

12.3.24 In the process of EcIA it is important to select the appropriate features for inclusion in the assessment. A threshold value of Local value has been set and all ecological receptors within the EZoI that are of Local value or higher have been included for consideration within the EcIA.

Significance Criteria

12.3.25 The assessments of potential impacts as a result of the Proposed Development has taken into account both the construction and operational phases. The significance level attributed to each impact has been based on the IEEM guidelines. These guidelines will be followed for the assessment criteria, in addition to those set out within Chapter 2 'Approach to the EIA', as they have been developed by IEEM to promote good practice in EcIAs. They have also been endorsed by the statutory consultees such as Natural England and the Association of Local Government Ecologists (ALGE).

12.3.26 Once the receptors were assigned a value and the EZoI was defined, the next stage in the assessment was to determine which ecological features or resources in the EZoI were of sufficient value to be included in the assessment and vulnerable to significant impacts as a result of the Proposed Development.

12.3.27 The impact assessment has been carried out by comparing the existing conditions on the Site and in the surrounding area with the construction information and the proposals for the construction and operational stages of the Proposed Development.

12.3.28 The assessment of impacts has been undertaken in relation to the baseline in a 'do nothing' scenario and with reference to the phasing information presented in Chapter 3 'The Proposed Development'. Cumulative impacts have been assessed, where necessary, including consideration of any changes in baseline conditions as a result of other consented or scheduled developments. The approach to consideration of these impacts is described in Chapter 2 'Approach to the EIA' and these impacts are also further considered in Chapter 17 'Cumulative Effects'.

12.3.29 Significant impacts have been assessed with reference to the ecological structure and function of the feature in question, for instance the fragility/stability of an ecosystem and its connectivity to other features or available resources (territory/foraging habitat) for the species.

12.3.30 The following parameters have been referred to in assessing impacts on ecological structure and function:

- **Positive or negative**;
- **Magnitude**: refers to the 'size' or 'amount' of an impact determined on a quantitative basis e.g. total or partial;
- **Extent:** the area over which the impact occurs;
- **Duration**: the period over which the impact is expected to last prior to recovery or replacement of the resource or feature e.g. short-term or long-term;
- **Reversibility**: whether recovery from the impact is possible or not e.g. irreversible (permanent) impacts or reversible (temporary) impacts; and
- **Timing and frequency.**

12.3.31 To assess the likelihood that a change/activity will occur as predicted and also the degree of confidence in the assessment of the impact on the ecological structure and function; the following confidence levels are used:

- **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%; or
- **Extremely unlikely**: probability estimated at less than 5%.

Impact Significance

12.3.32 An impact has been assessed as ecologically significant if it affects the integrity of a defined site or ecosystem and/or the conservation status of habitats or species within a given geographical area.

12.3.33 Integrity is taken to be the coherence of ecological structure and function, across its whole area that enables it to sustain the habitats and/or the levels of populations of the species present.

12.3.34 Conservation status is taken to be:

- 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; and
- 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 population within a geographical area.

12.3.35 The impact assessment has been carried out by comparing the existing conditions on the site and in the surrounding area with the construction and operational phases of the proposed development.

12.3.36 The value of any feature that will be significantly affected is then used to identify the geographical scale at which the impact is significant. The value relates directly to the consequences in terms of legislation, policy and/or development control at the appropriate level.

Residual Effects

12.3.37 This is assessed taking into account the proposed mitigation, compensation and enhancement. The significance is assessed as referred to above following implementation of mitigation.

12.3.38 The impacts of the Proposed Development will be summarised in relation to the following headings:

- Description of feature and ecological value;
- Proposed activity;
- Effects of unmitigated impact;
- Impact on integrity or conservation status and confidence level;
- Mitigation and enhancement; and
- Residual effects and confidence level.

12.4 BASELINE CONDITIONS

Limitations to Assessment

12.4.1 The data provided from consultees and metadatabases is based on existing records but does not necessarily constitute a comprehensive list of protected and notable species records. These records are not exhaustive, as there is currently no national or regional policy for systematic data gathering. Therefore, absence of data does not constitute evidence of absence (i.e. it may be that the Site has not previously been surveyed). It is also possible that other data exist within this area that has not been made available to WSPE.

12.4.2 All distances calculated are estimates, measured from the Site centre to the designated site centre.

Desk Study Consultation

Statutory Sites

12.4.3 No internationally or nationally designated sites are present within 2km of the Site.

12.4.4 Deame Valley Park LNR is situated adjacent to the eastern Site boundary. The reserve has been developed from relict habitats and reclaimed colliery around the river valley. The reserve consists of ancient acidic oak woodland, mixed plantation and willow dominated woodland, as well as areas of open grassland and scrub and a mosaic of wetland habitats including two ponds.

Non-statutory Sites

12.4.5 Two LWS and one proposed LWS are present within 2km of the Site, which are detailed below in Table 12.3:

Table 12.3: Details of LWS within 2km of Site

Designated Site	Status	Distance and Direction from the Site	Summary
Old Mill Lane Culvert Bat Roost	Candidate LWS	Within Site	Nationally important Daubentons bat roost within Old Mill Lane culvert adjacent to the River Dearne which flows through the Site. Peak count of 412 bats recorded in 1990.
Cliffe Wood	LWS	0.35km east	The site is a mosaic of habitats including woodland, scrub, grassland, marsh and open water. Much of the woodland is a good example of oak/birch woodland and there are areas of representative willow carr.
Barnsley Canal at Wilthorpe	LWS	0.7km north west	The site includes a stretch of the canal, part of the old course of the river, swamp and grassland. The site supports an assemblage of breeding and over wintering birds and the area supports populations of amphibians such as common toad, common frog and smooth newt. Great created newt have also been reported at Willowbank.

Protected Species

12.4.6 The following protected species relevant to the scheme have been recorded within the Desk Study Search Area:

Otters

12.4.7 Otters have been recorded on the River Dearne 700m north west of the Site in 2007. They have also been recorded 3.2km south east of the Site.

Bats

12.4.8 South Yorkshire Bat Group provided records of bats within 5km of the Site, as recommended by the Bat Mitigation Guidelines (English Nature 2004) (Ref 12.19). The following species have been recorded:

- Daubentons bat – a roost of over 400 bats has been recorded within the Site since the 1990's;
- Soprano pipistrelle (*Pipistrellus pygmaeus*);
- Common pipistrelle bat (*Pipistrellus pipistrellus*); and
- Brown long-eared bat (*Plecotus auritus*).

12.4.9 A number of consultees have provided details of the Daubentons bat roost located within the culvert adjacent to the River Dearne in the south west of the Site (**see Figure 12.2**).

12.4.10 The brick culvert is approximately 2m wide, 1.5m high and 90m long (Ref 12.19), running from the River Dearne banks adjacent to the Old Mill Lane road bridge within the Site. The head of the culvert lies beneath the entrance threshold to the former gas site. The roost chamber itself is hidden between the tarmac road surface and the roof of the culvert approximately 1.04m below the road surface, although the exact size of the roost chamber is currently unknown. The bats gain access to the roost chamber through small openings in a manhole type feature in the culvert roof.

12.4.11 In addition there are five small and much older stone culverts leading off the main culvert and crossing beneath Old Mill Lane (**see Figure 12.2**).

12.4.12 A number of monitoring surveys have undertaken at this Site since 1990 when the bat roost was first discovered (Ref 12.20). The counts have been summarised below in Table 12.4:

Table 12.4: Peak counts of Daubentons bats within culvert

Year	Peak Count (individual bats)	Surveyor
1990	412	National Bat Monitoring Programme
1991	325	National Bat Monitoring Programme
1992	316	National Bat Monitoring Programme
1993	309	National Bat Monitoring Programme
1994	286	National Bat Monitoring Programme
1995	266	National Bat Monitoring Programme
1996	196	National Bat Monitoring Programme
1997	261	National Bat Monitoring Programme
1998	No records	National Bat Monitoring Programme
1999	258	National Bat Monitoring Programme
2000	304	National Bat Monitoring Programme
2001	No records	National Bat Monitoring Programme
2002	257	National Bat Monitoring Programme
2003	293	National Bat Monitoring Programme
2010 (September)	67	TEP (on behalf of BMBC)
2011	82	Eric Bennett

12.4.13 There is no evidence that the bats use the culvert in the winter months due to the fact that during high water levels the culvert floods.

Fish

12.4.14 The EA provided records for the River Dearne 2km east of the Site between 2007 and 2010. Species recorded here are:

- Barbel (*Barbus barbus*);
- Common bream (*Abramis brama*);
- Brown trout (*Salmo trutta morpha fario*);
- Bullhead (*Cottus gobio*);
- Chub (*Leuciscus cephalus*);
- Dace (*Leuciscus leuciscus*);
- Gudgeon (*Gobio gobio*);
- Minnow (*Phoxinus phoxinus*);
- Roach (*Rutilus rutilus*);
- Stone loach (*Barbatula barbatula*);
- Perch (*Perca fluviatillis*); and

- Pike (*Esox lucius*).

Aquatic Invertebrates

12.4.15 The EA provided records for the River Dearne 700m north west of the Site between 1995 and 2010. The lowest Biological Monitoring Working Party (BMWP) score recorded was 30 (May 1995) and the highest was 105 (May 2009). The BMWP is an index for measuring the biological quality of rivers using species of macroinvertebrates as biological indicators. Since 2008, the scores recorded have been 77, 101, 105, 95 and 75, with an average BMWP score of 90.6. This score equates to a river quality of Good, clean but slightly impacted.

Flora and Habitats

12.4.16 The Phase 1 habitat map is shown as **Figure 12.1**. The habitat descriptions below should be read in conjunction with this plan and the Site plates in **Appendix 12.2**.

12.4.17 The Site comprises of the following habitats:

- River Dearne;
- Broad-leaved plantation woodland;
- Hardstanding;
- Buildings; and
- Bare ground.

River Dearne

12.4.18 The River Dearne flows west to east through the centre of the Site. At the western end of the Site, where the river flows into the Site underneath Old Mill Lane, the River Dearne is shallow and fast flowing with a substrate consisting of rocks and boulders. There is a culvert on the northern bank of the river adjacent to the bridge which is known to support a large Daubentons bat roost.

12.4.19 From the western boundary of the Site up until the gas holder on the southern bank the river is confined within tall retaining walls, thereafter the river is within more naturally vegetated banks. The whole section is thickly covered with trees, mostly Sycamore (*Acer pseudoplatanus*) and alder (*Alnus glutinosa*) overhanging and shading the river and creating a tunnel effect.

12.4.20 As the River Dearne flows east through the Site the channel becomes wider and deeper and the banks are dominated by scrub and marginal aquatic plants such as common reed and flag iris. Invasive species Japanese knotweed, giant hogweed and Himalayan balsam are all present growing on the banks of the River Dearne towards the eastern end of the Site.

12.4.21 The River Dearne as it flows through Barnsley has been classified as being of Good quality following BMWP guidance.

Broad-leaved plantation woodland

12.4.22 A strip of broad-leaved woodland is present along the northern and southern banks of the River Dearne. The main species present are alder, willow (*Salix* sp.) and sycamore, many of which overhang the river channel. The ground flora is relatively sparse here due to the density of the woodland canopy.

Hardstanding

12.4.23 Areas of hardstanding are present throughout the Site south of the River Dearne associated with the buildings, which has no ecological value.

Buildings

12.4.24 A number of large warehouse are present south of the River Dearne. These buildings were assessed for their potential to support roosting bats and have been classified as having Negligible potential due to them lacking any suitable features such as roof voids, or gaps beneath loose roof and ridge tiles and gaps behind lead flashing (see **Appendix 12.2**).

Bare ground

12.4.25 During the extended Phase 1 habitat survey undertaken in April 2011 construction of the road to access the proposed development had already commenced and therefore the majority of the Site north of the River Dearne consists of bare ground with the associated construction materials and plant and equipment.

Protected Species Surveys

12.4.26 The following protected species surveys have been undertaken between July and September 2011 during the appropriate survey periods for each species:

- Bat emergence and activity surveys;
- Water vole presence/likely absence survey; and
- Otter presence/likely absence survey.

Bats

12.4.27 None of the buildings to the south of the River Dearne, or the trees on Site has potential to support roosting bats.

12.4.28 Two emergence surveys of the culvert adjacent to the Old Mill Lane bridge over the River Dearne at the western end of the Site were undertaken on the 18th July and the 31st August 2011. Immediately following these emergence surveys activity surveys of the Site were undertaken.

12.4.29 Counts of 67 Daubentons bats on the 18th July and 61 Daubentons bats on the 31st August were recorded emerging from the culvert.

12.4.30 Consultation with Eric Bennetts revealed that the culvert was flooded in 2007. Post 2007 the counts of bat numbers have been significantly lower than those recorded between 1990 and 2003. It is likely that either the majority of the colony was killed during the flooding of the culvert, or the colony split up and another as yet undiscovered Daubentons bat roost exists within the locality. The number of bats recorded during the 2011 surveys (WSP) are consistent with the numbers recorded in 2010 (TEP) and 2011 (Eric Bennett).

12.4.31 During the activity surveys significant Daubentons bat foraging activity was recorded under the bridge and outside of the culvert opening. Small numbers of soprano and common pipistrelle were also recorded foraging and commuting along the River Dearne during the activity surveys undertaken in 2011. During lighting surveys undertaken in 2011 the river corridor was recorded as having a lux level of between 0.01 and 0.16 (see **Chapter 15: Lighting** for more details). This level is ideal for species of bats which are more susceptible to artificial lighting, such as Daubentons bats.

12.4.32 The bats were recorded foraging both downstream of the roost entrance and upstream to the west of the Site. The tree canopy and tall retaining walls provides an ideal dark corridor through the Site and wider landscape for foraging and commuting bats.

12.4.33 The main feeding grounds for the Daubentons bat colony are likely to be The Fleets, a large stillwater adjacent to the River Dearne approximately 200m north west of the Site. During previous survey work undertaken by Eric Bennetts in 2004 the Daubentons bats were recorded flying upstream from the roost entrance through the small woodland area to the west of the Site to avoid the weir on the River Dearne.

12.4.34 Apart from the river corridor, which is sheltered from artificial light spill by the strip of broad-leaved plantation woodland and therefore remains dark, the Site provides poor foraging habitat as it consists of bare ground, buildings and hardstanding, and only one common pipistrelle was recorded commuting over the bare ground in the north east of the Site during the August 2011 activity survey.

12.4.35 Full details of the bat surveys are provided in **Appendix 12.1.**

Otter

12.4.36 No evidence of otter presence was recorded within the Site during the 2011 survey. However, given the records of otter both upstream and downstream of the Site, and the fact that individual otters can have territories extending to 40km of linear habitat it is likely that otters commute through the Site.

12.4.37 There is no suitable habitat within the Site to support an otter breeding holt.

Water vole

12.4.38 No evidence of water vole presence was recorded during the 2011 survey. The banks of the River Dearne within the Site are suboptimal for this species given that they have shallow gradients which prevent burrowing and are heavily shaded and riparian vegetation is therefore sparse along the majority of the River Dearne that flows through the Site.

Birds

12.4.39 The Site does not possess any features that would suggest it would be of any special ornithological value. The small strip of broad leaved plantation woodland is likely to be used by small numbers of commoner nesting bird species. The buildings also provide nesting locations, although no evidence of this was recorded during the extended Phase 1 habitat survey undertaken in April 2011.

12.4.40 The River Dearne provides suitable foraging habitat for kingfisher (*Alcedo atthis*), although given the lack of suitable overhanging banks it is unlikely that this species breeds within the Site. No records of this species being present within 2km of the Site were returned during the 2011 desk study consultation.

Future Baseline

12.4.41 If the current regime were to continue there might be some small scale changes in the distribution or composition of habitats on the Site, although the ecological baseline would remain largely unchanged. It can be assumed that the Site currently supports species at its carrying capacity. This means that a net increase in species population numbers would not be expected should the Proposed Development not go ahead if the Site is to continue with the current management regime.

12.5 VALUE OF THE ENVIRONMENTAL RESOURCES AND RECEPTORS

Valued Ecological Features

12.5.1 All of the ecological receptors within the EZoI that have the potential to suffer significant negative impacts as a result of the Proposed Development have been valued according to the criteria outlined above in Table 12.2.

12.5.2 The value of habitats and species is measured against published selection criteria where available. Recognised site selection criteria are applied for the designation of sites of International importance, such as SACs and nationally important sites such as SSSIs (Nature Conservancy Council, 1989). Other selection criteria may be present at a regional or county level, most often prepared by the Local Authority or county Wildlife Trusts.

12.5.3 For the evaluation of habitats and species, reference has been made to UK and local HAPs and Species Action Plans (SAP's), although the recognition of an ecological receptor subject to an Action Plan (AP) reflects the fact that the receptor concerned is threatened and hence conservation action is required. The AP does not necessarily imply any specific level of value to the receptor type concerned.

12.5.4 Based upon the initial Site visit undertaken in April 2011, and the further survey work undertaken in July and August 2011, following guidance provided within *Valuing Bats in Ecological Impact Assessment* (Wray etc al 2010) (Ref 12.21) the following values have been assigned:

- Roosting Daubentons bat (maternity roost) – Regional; and
- Commuting and Foraging rarer species of bat – Regional.

12.5.5 Pre-2007 flooding the roost on Site was thought to be amongst the largest Daubentons bat maternity roosts in the country, if not the largest. Whilst the current size of the bat roost on Site is above the typical average size for a Daubentons bat maternity roost (20-50 bats), since the 2007 floods the numbers of bats have reduced from 300-400 to 60-80, and therefore the bat roost has been valued as being of Regional rather than National importance.

12.5.6 Due to the size of the Site and the habitats present, a breeding bird survey was not undertaken as part of this assessment. Given the limited habitat present on Site it is likely that the Site will only support common and widespread species and with only small areas of suitable habitat the numbers of breeding birds present are likely to be low and therefore the Site is considered to have only Site level at most for breeding birds.

Table 12.5: Value of Sensitive Receptors/Resources

Sensitive Receptor / Resource	Value	Justification for Value
River Dearne	County	A viable area of habitat identified in both local and national BAP that supports species threatened or rare in the UK and Europe. .
Broad-leaved plantation woodland	Site[1]	Small areas of plantation woodland that have potential to support common species of breeding birds.
Bare Ground / Buildings / Hardstanding	Negligible	Habitat of limited ecological value that is abundant in the local area.
Bats	Daubentons Bat Roost – Regional Foraging and Commuting Bats - Regional	The Site supports a Daubentons bat maternity roost of approximately 60-80 bats. The River Dearne provides optimal foraging and commuting habitat for the bats.
Otters	County	The River Dearne provides a safe corridor of movement through the wider landscape. No breeding sites exist on or adjacent to the Site.
Birds	Site	The Site is likely to support small numbers of common bird species.

[1]The broad-leaved woodland has been valued independently of the fact that it contributes to the foraging and commuting habitat for the Daubentons bat roost. Impacts to bats through the removal of the woodland have been assessed under the potential impacts to roosting, foraging and commuting bats.

12.6 ASSESSMENT OF POTENTIAL EFFECTS AND MAGNITUDE OF CHANGE PRIOR TO MITIGATION

Description of Potential Effects

12.6.1 An assessment of the potential effects during both the construction and operational phase that the Proposed Development may have upon each ecological resource has been made below.

12.6.2 Receptors outside the EZoI will not be affected by any activities or processes involved in the scheme and are therefore not considered further in this assessment.

Construction Impacts

Impacts to roosting, foraging and commuting bats

12.6.3 The construction phase has the potential to impact upon the Daubentons bat roost present within the culvert at the western end of the Site, along with the associated foraging and commuting routes of the bats.

Increases in artificial lighting

12.6.4 In the absence of mitigation there is the potential for indirect impacts to the Daubentons bat roost through disturbance of roosting bats resulting from increases in artificial lighting and light spill in the vicinity of the roost entrance during the construction phase. Illuminating a bat roost creates disturbance and may cause the bats to desert the roost. Light falling on a roost access point will at least delay bats from emerging and this shortens the amount of time available to them for foraging. As the main peak of nocturnal insect abundance occurs at and soon after dusk, a delay in emergence means this vital time for feeding is missed.

12.6.5 The River Dearne corridor is used as both an important *foraging* area for the Daubentons bats when they first emerge from the roost, as well as a dark corridor for commuting into the wider landscape both upstream and downstream of the Site. Increases in artificial lighting and light spill onto the River Dearne corridor will have an impact in the absence of mitigation. Daubentons bats are slow flying and avoid artificial lights, and therefore an increase in lighting onto the river corridor is likely to decrease the areas of foraging habitat available and prevent the Daubentons bats from commuting to their preferred feeding grounds upstream and downstream of the Site.

12.6.6 Many night flying insects are attracted to light, especially those that emit an ultra-violet component. Whilst studies have shown that some species of bats, such as pipistrelle, noctule and Leislers swarm around such lights feeding on the insects attracted to the light, slower flying species such as the myotid bats, including Daubentons bats, avoid such lights. Erection of this type of lighting in the vicinity of the River Dearne is likely to decrease the numbers of night flying insects available to the bats foraging over the river as the insects are attracted to the artificial lighting.

12.6.7 Artificial lighting is also thought to increase the chances of bats being preyed upon by avian predators such as kestrels (*Falco tinninculus*) hunting at night under the artificial light along motorways.

12.6.8 Increases in artificial lighting levels at the Site during the Construction Phase, in particular during the construction of the bridge over the River Dearne and in the vicinity of roosting, foraging or commuting Daubentons bats will result in a **Probable Temporary, Direct Long-term Negative** impact at the **Regional** scale prior to the implementation of mitigation measures.

Increases in noise and vibration

12.6.9 Whilst the culvert entrance is located adjacent to the River Dearne, the actual roost chamber itself is located approximately 90m north of the culvert entrance underneath the current Old Mill Lane entrance to the Site (see **Figure 12.**), and is approximately 1m below the road surface. The potential therefore exists for heavy noise and vibration in the vicinity of the roost chamber to disturbance roosting bats, especially during critical life-cycle stages such as breeding. However, the bat roost has been present within the culvert since at least 1990 when it was first discovered and has been subject to certain levels of disturbance from everyday road traffic, as well as construction works associated with road improvements and historic demolition of buildings associated with the former gas works on Site.

12.6.10 Heavy plant use in the vicinity of the roost chamber causing significant noise and vibration during the Construction Phase will result in an **Unlikely Temporary, Direct Short-term Negative** impact at the **Regional** scale upon roosting bats prior to the implementation of mitigation measures.

Damage/Destruction of the bat roost

12.6.11 The bat roost, being only 1m below the road surface, is vulnerable to damage or destruction due to excavations being undertaken in the vicinity of the roost chamber. Should the roost chamber be breached this could lead to the total destruction of the roost and loss of the Daubentons bat colony.

12.6.12 The roost is also susceptible to flooding. During the Construction Phase the potential exists for surface water run-off from the development site to raise water levels within the River Dearne which could lead to the total loss of the bat colony.

12.6.13 Excavations in the vicinity of the roost chamber and excessive surface water run-off into the River Dearne leading to flooding of the culvert during the Construction Phase will result in a **Probable Permanent, Direct Long-term Negative** impact at the **Regional** scale upon roosting bats prior to the implementation of mitigation measures.

Loss of the woodland strip

12.6.14 The plantation woodland strip along the banks of the River Dearne provides a dark enclosed corridor of movement for bats to move through the Site to more optimal foraging grounds upstream and downstream of the Site, in particular the Daubentons bats which roost in the Site and travel upstream to the open waters of The Fleets, a large lake to the north west of the Site.

12.6.15 Removal of this woodland will increase the natural and artificial lighting levels upon the River Dearne, in particular from the warehouses to the south of the Site which all have security lighting illuminating them during night time hours. This increase in lighting would lead to the same impacts detailed above.

12.6.16 Removal of the woodland in the Site along the banks of the River Dearne during the Construction Phase will result in a **Probable Permanent, Indirect Long-term Negative** impact at the **Regional** scale upon roosting, foraging and commuting bats prior to the implementation of mitigation measures.

Mitigation

Increases in artificial lighting

12.6.17 A Construction Environmental Management Plan (CEMP) will be prepared and agreed in advance of commencement of the construction activities. The CEMP will highlight sensitive environmental receptors and the

potential impacts from construction, and will require contractors to sign up to its adoption. The CEMP will specify the locations of the contractor's compound, material storage areas and temporary security/health and safety lighting required throughout the works to ensure that the siting of such features considers the surrounding sensitive receptors and that any disturbance impact from lighting is reduced to a minimum.

12.6.18 Lighting provided during the Construction Phase will be limited to certain areas of the EZoI at any one time and its use will be short term in nature. This will mainly comprise security lighting in the vicinity of plant, temporary buildings etc. for the duration of the Construction Phase. No artificial night time lighting will be present in the vicinity of the culvert entrance or the River Dearne corridor, reducing the overall impacts upon foraging bats.

12.6.19 The lighting levels within the river corridor will be maintained at their current levels of between 0.01 and 0.16 lux following the above mitigation measures.

Increases in noise and vibration

12.6.20 No construction works that have the potential to cause significant levels of noise or vibration will be undertaken in the vicinity of the roost chamber between the months of May and September when the bats are breeding.

12.6.21 No night working will be undertaken and therefore impacts to foraging and commuting bats through increases in noise and vibration are not anticipated to occur during the construction phase.

Damage and/or destruction of the bat roost.

12.6.22 No excavation work will be carried out within 5m of the centre line of the culvert unless undertaken by hand with extreme care to prevent the roost chamber being damaged or destroyed.

12.6.23 Drainage systems (as detailed in **Chapter 14 Road Drainage and the Water Environment**) will be implemented at the Site during the Construction Phase to prevent excessive surface water run-off entering the River Dearne and flooding the culvert.

Loss of the woodland strip

12.6.24 No trees will be removed along the banks of the River Dearne during the construction phase and therefore the integrity of the dark corridor along the River Dearne will be maintained.

Residual Effects

Increases in artificial lighting

12.6.25 Providing the mitigation measures outlined above are implemented throughout the Construction Phase, no significant direct or indirect effects on roosting, foraging or commuting bats are anticipated. The residual impacts are therefore assessed as being **'not significant'**.

Increases in noise and vibration

12.6.26 Providing the mitigation measures outlined above are implemented throughout the Construction Phase, no significant direct or indirect effects on roosting bats are anticipated. The residual impacts are therefore assessed as being **'not significant'**.

Damage and/or destruction of the bat roost.

12.6.27 Providing the mitigation measures outlined above are implemented throughout the Construction Phase, no significant direct or indirect effects on roosting bats are anticipated. The residual impacts are therefore assessed as being **'not significant'**.

Loss of the woodland strip

12.6.28 Providing the mitigation measures outlined above are implemented throughout the Construction Phase, no significant direct or indirect effects on roosting, foraging or commuting bats are anticipated. The residual impacts are therefore assessed as being **'not significant'**.

Pollution and Contamination of the River Dearne

12.6.29 During the construction phase, there is an elevated risk of potential leakages or accidental spillage of potential pollutants used within the Site entering the River Dearne. Contaminated runoff resulting in the pollution of waterbodies could result from:

- Unstable exposed soils;
- Excavated materials;
- Stored aggregates;
- Washout facilities (washing of tools, plant and equipment);
- Storage and use of various liquids and soluble solids;
- Fuel storage and handling; and
- Disposal of foul drainage and waste storage.

12.6.30 Silt laden runoff can arise from:

- Land clearance;
- Exposed ground;
- Excavations;
- Stockpiles;
- Plant and wheel washing;
- Site roads;
- Movement and storage of materials to and from the Application Site; and
- Other construction activities.

12.6.31 Silt laden runoff could cause increased sediment loads in receiving waterbodies resulting in direct effects such as increased turbidity and a reduction in dissolved oxygen. Indirect effects could be caused by suspended sediments that have associated inorganic and organic compounds (such as heavy metals and pesticides) and include: reducing light penetration; reducing plant growth; smothering vegetation and bed substrates; impacts on invertebrate and fish communities and the destruction of feeding areas, refuges and breeding / spawning areas. These impacts can have an effect upon organisms at the top of the food chain such as otters that will rely on key fish stocks to survive.

12.6.32 The magnitude of any impact from contaminated runoff or accidental spillage of potential pollutants will depend on the scale and nature of any incident and thus is difficult to predict.

12.6.33 Prior to the implementation of mitigation measures, there will be a **Probable Permanent, Direct Long-term Negative** impact at the **County** scale upon the River Dearne.

Mitigation

12.6.34 Pollution of the River Dearne via site drainage during construction will be prevented through the use of interceptors, settlement tanks, attenuation ponds or filters, use of designated washdown areas and safe disposal of surface water run-off from excavations as appropriate which may be contaminated with silt.

12.6.35 Contamination of groundwater and watercourses during re-fuelling and oil changes will be prevented by undertaking these activities within a physically bunded area with an impermeable base away from the river. This area will be sited to avoid both direct and indirect effects upon valued ecological features.

12.6.36 Pollution of watercourses due to excavated soils entering and causing siltation will be prevented through careful siting of any excavated materials to prevent surface waters leaching soils or nutrients into them and the installation of interceptors and silt traps. Further details are provided in **Chapter 14 Road Drainage and the Water Environment.**

12.6.37 A CEMP or similar document will be produced for the construction works in advance of works commencing to include method statements for specific construction activities.

12.6.38 Construction work will be undertaken in accordance with measures as stated under guidance such as the Environmental Alliance, Pollution Prevention Guidelines 5, 6, 21 and 22 (SEPA, Environment Agency and EHSNI) (Ref 12.22).

12.6.39 It is recommended that monitoring of the River Dearne is undertaken during the construction phase of the Proposed Development to confirm that the mitigation techniques detailed above are suitable and that no pollution, sedimentation or contamination is occurring to this watercourse.

12.6.40 This monitoring should take the form of water quality analysis, and therefore a baseline of the River Dearne needs to be established prior to construction beginning.

Residual Impacts

12.6.41 Following the implementation of mitigation measures, water quality impacts associated with the construction phase are considered to result in an ecological impact which is not significant.

Impacts to foraging and commuting otters

12.6.42 Whilst no signs of otter presence was recorded within or adjacent to the Site, given the recent records of otters both upstream and downstream of the Site, and the fact that this species has territories of up to 40km of linear habitat, it is likely that otters commute through the Site along the River Dearne corridor. It is unlikely that otters breed within or adjacent to the Site given the lack of any potential holt locations.

Disturbance

12.6.43 Some potential for otters to be using the woodland as a temporary resting place exist, although no evidence off this was recorded. Where construction activities occur in close proximity to these areas disturbance could occur. The physical disturbance caused by noise, machinery and an increase in human activity associated with a construction site all have the potential to cause otters to deviate from their normal behaviour.

12.6.44 Furthermore if an otter is sheltering in close proximity to any construction area prior to works beginning, any associated disturbance could increase stress within an animal and force it into moving away from the area, particularly during daylight hours

12.6.45 The construction of the bridge crossing the River Dearne will cause disturbance/disruption to this area of the Site. Whilst otters are inquisitive animals and likely to investigate any changes to habitats in their home range, they may also avoid such areas particularly if vulnerable i.e. if young are present. In doing so, there may be a reduction in the available foraging habitat during the works. Otters have a large territory, potentially up to 40km of linear habitat for a male. If otters do avoid the area this may result in them being unable to reach more favourable forging ground or potential resting/breeding sites within their territory downstream or upstream of the Site.

12.6.46 As stated, otters can be particularly inquisitive where change has occurred within their home range. Construction sites can therefore be hazardous to otters if they become trapped or injured whilst investigating construction areas and associated machinery.

12.6.47 Increased light levels within the Site, such as those described previously, have the potential to disturb otters whilst they are commuting and foraging along the river corridor, which could reduce their territory range both upstream and downstream of the Site.

12.6.48 Disturbance during the Construction Phase will result in an **Unlikely Temporary, Direct Short-term Negative** impact at the **County** scale to otters prior to the implementation of mitigation measures.

Water Quality

12.6.49 The otter is dependant to a degree on relatively clean water, which is of sufficient quality to support prey items. In addition, otters, being at the top of the food chain, may accumulate certain compounds in food, which can have detrimental effects on otter survival and fecundity.

12.6.50 During the Construction Phase, there is an elevated risk of potential leakages or accidental spillage of potential pollutants used within the Site entering the River Dearne. Contaminated runoff resulting in the pollution of waterbodies could result from those activites detailed in 12.6.28 and 12.6.29.

12.6.51 The magnitude of any impact from contaminated runoff or accidental spillage of potential pollutants will depend on the scale and nature of any incident and thus is difficult to predict. However, it has the potential to significantly impact upon the aquatic ecosystem upon which otters rely upon to survive.

12.6.52 Pollution of the River Dearne during the Construction Phase will result in a **Probable Temporary, Indirect Long-term Negative** impact at the **County** scale prior to the implementation of mitigation measures.

Mitigation

Disturbance

12.6.53 No night working will be undertaken and all working periods restricted to those within the period from one hour after dawn to one hour before sunset.

12.6.54 All machinery and materials associated with the road construction will be left overnight/stockpiled at least 30m away from the River Dearne wherever possible.

12.6.55 Lighting will be minimised and directed to avoid spill on to the River Dearne and the woodland strip along the banks of the River Dearne, reducing the overall impacts during the construction phase.

12.6.56 As detailed above a CEMP will be prepared and agreed in advance of commencement of the construction activities, to ensure that the impacts through lighting on the Site are controlled and minimised.

12.6.57 Deep excavations (> 1m) will not be left open when unattended. Alternative means of safe egress, in the form of scaffold planks (placed at angles no greater than 45°) will be provided in all deep excavations when left unattended to allow otters a means of escape if they enter such an excavation.

Water Quality

12.6.58 Mitigation measures to protect the River Dearne will be implemented as detailed in 12.6.32 to 12.6.37 will help to minimise the potential impacts to fish populations which otter feed upon.

12.6.59 Every effort will be made to ensure that recommendations made within relevant EA Pollution Prevention Guidelines (PPG) are followed during the Construction Phase of the Proposed Development, that the proposed works are carried out in an environmentally sensitive manner and that a preventative approach is adopted.

Residual Effects

Disturbance

12.6.60 Providing the mitigation measures outlined above are implemented throughout the Construction Phase, no significant direct or indirect effects on otters are anticipated. It is anticipated that should otters be present during the Construction Phase there will be an **Unlikely Temporary Direct Short-term** impact at **Site** level.

Water Quality

12.6.61 Providing the mitigation measures outlined above are implemented throughout the Construction Phase, no significant direct or indirect effects on otters are anticipated. The residual impacts are therefore assessed as being **'not significant'**.

Spread of Invasive Weeds

12.6.62 Large sections of the vegetated banks of the River Dearne are dominated by Japanese knotweed, Himalayan balsam and giant hogweed. These plants, in particular Japanese knotweed cause a variety of problems including those which can be categorised as detrimental to nature conservation, recreation and landscape, and the built environment.

12.6.63 Japanese knotweed shoots are able to push up through tarmac; therefore damaging public facilities such as pavements and car parks. Rhizomes have been recorded penetrating foundations and other walls, land drainage works and lifting interlocking concrete blocks (e.g. flood defence revetments) causing a wide variety of damage with high associated costs. Damage is not only costly to repair, but will become a recurring expense unless the Japanese knotweed is controlled.

12.6.64 During construction works in the vicinity of the River Dearne, in particular the construction of the bridge over the river, there is a risk of spreading these invasive weeds across both the Site and further afield. Therefore the impact

through the spread of invasive weeds and potential environmental damage will be a **Probable, Direct, Permanent Long-term Negative** impact at the **Site** scale.

Mitigation

12.6.65 Areas of the Site where invasive weeds are growing, or suspected as being present, will be fenced off and no construction works will take place until the control methods outlined below have been fully implemented.

12.6.66 The exact treatment method will have to be agreed by BMBC and the EA before any works are undertaken.

On-site Treatment

12.6.67 The first choice method to miligate against the presence of invasive weeds will be on-site treatment, which can involve the following:

- Chemical treatment;
- Manual control; and
- Mechanical control

12.6.68 Chemical treatment using herbicides alone can effectively control invasive weeds such as Japanese knotweed. However the presence of the River Dearne will restrict the type of herbicide that can be used, and the strength of the herbicide reflects the time taken to achieve eradication.

12.6.69 Manual control involves cutting the stems at specific locations on the stem several times per year, which exhausts the energy reserves the Japanese knotweed has stored in the underground rhizomes. However this method takes several years to become effective, but is a useful alternative on sites where herbicides or heavy machinery cannot be used.

12.6.70 Mechanical control involves on site burial, which must follow the EA Code of Practice. On site burial will be possible if:

- there are no other contaminants;
- the water table is sufficiently deep;
- the ground will remain undisturbed; and
- EA approval has been given.

12.6.71 If on site burial is approved, excavation to a depth of 2m and up to 7m radius from the leading edge of the Japanese knotweed clump will be undertaken to ensure removal of all rhizomes, roots and shoots. Material will be buried to a depth of at least 5m and covered with a suitable geotextile membrane or heavy gauge polythene prior to infilling.

Off-site Treatment

12.6.72 If on site treatment is not possible, then off-site treatment will follow the excavation methods outlined above, but the waste is disposed of to a landfill site licenced to receive invasive weeds such as Japanese knotweed contaminated material.

Residual Effects

Following the mitigation strategy outlined above it is anticipated that impacts from invasive weeds such as Japanese knotweed associated with the construction phase are considered to result in an ecological impact which is not significant.

Operational Impacts

Impacts to roosting, foraging and commuting bats

12.6.73 The operational phase has the potential to impact upon the Daubentons bat roost present within the culvert at the western end of the Site, along with the associated foraging and commuting routes of the bats.

Increases in artificial lighting

12.6.74 In the absence of mitigation there is the potential to disturb roosting, foraging and commuting bats during the Operational Phase resulting from increases in artificial lighting and light spill in the vicinity of the Daubentons bat roost entrance and the River Dearne corridor. These impacts can result from street lighting, lighting on buildings, lighting of the bridge over the River Dearne, and car headlights on both the road and the car parks.

12.6.75 An increase in lighting can impact upon bats as described in 12.6.3 to 12.6.8.

12.6.76 Increases in artificial lighting levels at the Site during the Operational Phase in the vicinity of roosting, foraging or commuting Daubentons bats will result in a **Probable Permanent, Direct Long-term Negative** impact at the **Regional** scale prior to the implementation of mitigation measures.

Increases in noise

12.6.77 Roosting bats are susceptible to noise and vibration disturbance in the vicinity of a roost, and therefore the operational phase, which will lead to an increase in the levels of disturbance at the Site from road traffic and human activity has the potential to disturb roosting and foraging bats. However, the Daubentons bat roost is already subject to relatively high levels of disturbance as it is situated adjacent to Old Mill Lane and therefore a large volume of traffic passes over the culvert every day.

12.6.78 The increase in activity at the Site during the Operational Phase will result in an **Unlikely Permanent, Direct Long-term Negative** impact at the **Regional** scale upon roosting and foraging bats prior to the implementation of mitigation measures.

Damage or destruction of the bat roost

12.6.79 The roost is susceptible to flooding. During the Operational Phase the potential exists for surface water run-off from the Site to raise water levels within the River Dearne which could lead to the flooding of the culvert and total loss of the bat colony.

12.6.80 Excessive surface water run-off into the River Dearne leading to flooding of the culvert during the Operational Phase will result in a **Probable Permanent, Direct Long-term Negative** impact at the **Regional** scale upon roosting bats prior to the implementation of mitigation measures.

Mitigation

Increases in artificial lighting

12.6.81 The dark corridor along the River Dearne will be maintained. To facilitate this, no artificial night time lighting will be present in the vicinity of the culvert entrance. No light spill from either street or road lighting, the bridge over the River Dearne or lighting on buildings will impact upon the River Dearne corridor through careful design of a detailed lighting strategy for the proposed development. To prevent car headlights illuminating the river corridor a closeboard fence 2m high will also be provided between the woodland strip and the rest of the Site. These proposals should maintain the operational light levels along the river corridor at a level equivalent to the current baseline, which is between 0.01 and 0.16 lux within the river corridor and allow bats continued use of the River Dearne for foraging and commuting.

Increases in noise

12.6.82 No public access during the Operational Phase of the proposed development will be allowed within 30m of the culvert entrance. The 2m high close board fence will prevent public access to the River Dearne. A minimum 8m buffer will be maintained between the River Deane and any development to help minimise the impacts from noise disturbance to roosting, foraging and commuting bats.

Damage or destruction of the bat roost

12.6.83 Drainage systems (as detailed in **Chapter 14 Road Drainage and the Water Environment**) will be implemented at the Site during the Construction Phase to prevent excessive surface water run-off entering the River Dearne and flooding the culvert.

Residual Effects

Increases in artificial lighting

12.6.84 Providing the mitigation measures outlined above are implemented throughout the Operational Phase, no significant direct or indirect effects on roosting, foraging or commuting bats are anticipated. The closeboard fence will result in the continuity of the dark corridor and therefore, and due to the presence of some light spill from the current warehouses to the south of the river the residual impacts are therefore assessed as being a **Probable Direct Permanent Long-term Positive** impact at the **Site** scale.

Increases in noise and vibration

12.6.85 Providing the mitigation measures outlined above are implemented throughout the Operational Phase, no significant direct or indirect effects on roosting, foraging or commuting bats are anticipated. The residual impacts are therefore assessed as being **'not significant'**.

Damage or destruction of the bat roost

12.6.86 Providing the mitigation measures outlined above are implemented throughout the Operational Phase, no significant direct or indirect effects on roosting bats are anticipated. The residual impacts are therefore assessed as being **'not significant'**.

Impacts to foraging and commuting otters

Lighting

12.6.87 The installation of lighting at the Site, along with the increase in noise and visual disturbances associated with the Operational Phase of the proposed development could result in a direct disturbance to otters who are commuting through and foraging along the River Dearne.

12.6.88 The physical disturbance caused by noise and an increase in human activity associated with a busy development site all have the potential to cause otters to deviate from their normal behaviour and could increase stress within an animal and force it into moving away from the area.

12.6.89 Disturbance during the Operational Phase will result in an **Unlikely Permanent, Direct Long-term Negative** impact at the **County** scale to otters prior to the implementation of mitigation measures.

12.6.90 Mitigation

12.6.91 As detailed above, artificial lighting will be minimised and directed to avoid spill on to the River Dearne and the associated woodland strip. The closeboard fence will also reduce disturbance from lighting, visual and noise upon otters foraging and commuting along the River Dearne through the Site.

Residual Impacts

12.6.92 Providing the mitigation measures outlined above are implemented throughout the Construction Phase, no significant direct or indirect effects on otters are anticipated. The residual impacts are therefore assessed as being **'not significant'**.

Positive contributions towards long-term biodiversity gain

12.6.93 The Proposed Development includes scope for the protection and long-term management and enhancement of the Daubentons bat roost, River Dearne and the existing plantation woodland strip to maximise biodiversity gain.

Mitigation

12.6.94 The plantation woodland along the banks of the River Dearne will be managed to maintain its structural integrity in the long-term through the adoption of sensitive and appropriate pruning, the thinning out or supplementary planting of appropriate woody species. This, in combination with the closeboard fence erected along the River Dearne, will maintain the River Dearne as a dark corridor for bat foraging and commuting.

12.6.95 The new bridge over the River Dearne will contain integral bat bricks (exact number to be agreed at the detailed design stage) to provide bats, in particular the Daubentons bats with additional and alternative roosting locations within Site.

Residual Effects

12.6.96 It is considered **Probable** that provision of an appropriate habitat management strategy for the River Dearne and the associated woodland, the erection of a closeboard fence along the River Dearne and the inclusion of integral

bat bricks within the new bridge over the River Dearne, that there will be a **Positive Long-term Direct** impact of significance at the **Site** level.

12.7 MONITORING AND FOLLOW UP

12.7.1 Monitoring of the River Dearne, as outlined in the Mitigation section above, should be undertaken during the Construction Phase to confirm that the mitigation techniques are suitable and that no pollution, sedimentation or contamination is occurring to this watercourse. This monitoring should take the form of water quality analysis, and therefore a baseline of theRiver Dearne needs to be established prior to construction beginning.

12.7.2 It is recommended that monthly monitoring surveys of the Daubentons bat roost are undertaken between May and September during the Construction Phase to confirm that that the mitigation techniques are suitable and that no significant impact upon roosting, foraging or commuting bats are occurring.

12.7.3 Following completion of the development, three monitoring surveys of the Daubentons bat roost should be undertaken between May and September for five years following completion of the development, to assess the suitability and success of the mitigation proposals outlined above.

12.7.4 Results of the surveys will be sent to Natural England, the Bat Conservation Trust and BMBC.

12.8 LIMITATIONS AND ASSUMPTIONS

12.8.1 All of the protected species surveys undertaken in 2011 to establish the ecological baseline of the EZoI were carried out within the recognised survey season for each species by suitably qualified and experienced ecologists and therefore the conclusions of this assessment have been based upon robust up to date survey data.

12.8.2 The data provided from consultees and metadatabases is based on existing records but does not necessarily constitute a comprehensive list of protected and notable species records. These records are not exhaustive as there is currently no national or regional policy for systematic data gathering. Therefore absence of data does not constitute evidence of absence (i.e. it may be that the Site has not previously been surveyed). It is also possible that other data exist within this area that has not been made available to WSPE.

12.9 CUMULATIVE IMPACTS

12.9.1 With the exception of the A61 Quality Bus Corridor Phase 3 Wakefield Road/ Burton Junction Improvement it is considered that there will be no cumulative effect upon ecology and nature conservation as all other committed developments are located at a sufficient distance from the Proposed Development and are of a small scale.

A61 Quality Bus Corridor Phase 3 Wakefield Road/Burton Road Junction Improvement

12.9.2 This development, which is situated within the Site boundary, involves the construction of a highway from a point on Burton Road 260m south east of its junction with Wakefield Road and Old Mill Lane (A61), generally south westwards then generally north westwards to a point on Old Mill Lane (A61) 178m south of its junction with Burton Road.

12.9.3 The construction of the highway began in March/April 2011, which involved the removal of existing scrub and ruderal vegetation on the Site.

12.9.4 No supporting information was available for this project on the BMBC website, so it is unknown whether any ecological surveys, mitigation or enhancement has been undertaken.

Cumulative Impact

12.9.5 The constructions of the new highway within the Site will result in a **Probable Permanent Long-term Negative** in-combination impact at **Site** level.

12.10 SUMMARY

12.10.1 Information gathered from data searches and consultation, an extended Phase 1 habitat survey and protected species surveys for bats, water vole and otter in 2011 have been used in order to evaluate the Site and surrounding areas in terms of the protected species and important habitats that have the Site has the potential to support and which may be adversely affected by the Proposed Development.

12.10.2 The Site is largely bare ground associated with the construction of the new road to service the Proposed Development. The River Dearne flows through the Site, which has been valued as being of County significance. Along the banks of the river is a small strip of broad-leaved plantation woodland which overhangs the river forming an enclosed canopy. A number of warehouses are present to the south of the River Dearne.

12.10.3 Bat emergence and activity surveys at the Site confirmed the presence of a large Daubentons bat roost of approximately 60-80 bats within the culvert adjacent to the River Dearne and running parallel with Old Mill Lane. The bats forage upstream and downstream of the Site. No significant foraging activity was recorded across the rest of the Site. No evidence of otter or water vole presence was recorded within the Site. Given the records of otter on the River Dearne both upstream and downstream of the Site it has been concluded that otters are likely to commute through the Site.

12.10.4 In recognition of the ecological receptors identified during the field surveys and consultation, the Ecological Impact Assessment focused on potential direct and indirect impacts on bats, in particular the Daubentons bat roost; the River Dearne; foraging otters and invasive weeds. Effects on sensitive receptors were identified and an appropriate mitigation strategy developed to either eliminate or reduce effects to an acceptable level. Mitigation measures adopted focus on the protection and/or reinstatement of important ecological receptors through careful site design, the implementation of a sensitive lighting strategy to minimise effects on roosting, foraging and commuting bats, and the prevention of pollution of the River Dearne through the preparation and implementation of a Construction Environmental Management Plan.

12.10.5 It is anticipated that impacts can be mitigated for and no significant impacts to protected species will occur as a result of the Proposed Development. Overall, with the implementation of suitable mitigation, there will be a probable neutral impact resulting from the Proposed Development, and that the scheme would comply with national, regional and local policies.

12.10.6 A summary of the effects of the Proposed Development on ecology and nature conservation is provided below **In Table 12.6**.

Table 12.6: Summary of Effects Table for Ecology and Nature Conservation

Description of Likely Significant Effects	Significance of Impacts					Summary of Mitigation / Enhancement Measures	Significance of Residual Effects					Relevant Policy	Relevant Legislation
	Level of Impact	Positive / Neutral / Negative	(P/T)	(D/I)	ST/MT/LT)		Level of Impact	Positive / Neutral / Negative	(P/T)	(D/I)	ST/MT/LT)		
Construction													
Impacts to roosting, foraging and commuting bats – Increases in artificial lighting	Regional	Negative	T	D	LT	▪ Adoption of a CEMP ▪ Avoidance of increase in artificial lighting levels on known roosting, foraging and commuting areas within the Site.	Not significant	Neutral	n/a	n/a	n/a	PPS 9 Yorkshire and Humber Plan Barnsley Core Strategy	Wildlife and Countryside Act 1981 Conservation of Habitats and Species Regulations 2010
Impacts to roosting, foraging and commuting bats – Increases in noise and vibration	Regional	Negative	T	D	ST	▪ Works to be timed to avoid sensitive periods of the year (May to September) in the vicinity of the bat roost. ▪ No night time working to be undertaken in the vicinity of the River Dearne.	Not significant	Neutral	n/a	n/a	n/a	PPS 9 Yorkshire and Humber Plan Barnsley Core Strategy	Wildlife and Countryside Act 1981 Conservation of Habitats and Species Regulations 2010
Impacts to roosting, foraging and commuting bats – Damage/destruction of the bat roost.	Regional	Negative	P	D	LT	▪ No excavation work will be carried out within 5m of the centre line of the culvert unless undertaken by hand	Not significant	Neutral	n/a	n/a	n/a	PPS 9 Yorkshire and Humber Plan Barnsley Core Strategy	Wildlife and Countryside Act 1981 Conservation of Habitats and Species Regulations 2010
Impacts to roosting, foraging and commuting bats – Loss of the woodland strip.	Regional	Negative	P	I	LT	▪ No trees will be removed along the banks of the River Dearne	Not significant	Neutral	n/a	n/a	n/a	PPS 9 Yorkshire and Humber Plan Barnsley Core Strategy	P
Pollution and contamination of	County	Negative	P	D	LT	▪ Use of interceptors, settlement tanks, attenuation ponds or filters, use of designated wash-down areas and safe disposal of surface	Not significant	Neutral	n/a	n/a	n/a	PPS 9 Yorkshire and Humber Plan	Pollution prevention guidelines

Description of Likely Significant Effects	Significance of Impacts					Summary of Mitigation / Enhancement Measures	Significance of Residual Effects					Relevant Policy	Relevant Legislation
	Level of Impact	Positive / Neutral / Negative	(P/T)	(D/I)	ST/MT/LT)		Level of Impact	Positive / Neutral / Negative	(P/T)	(D/I)	ST/MT/LT)		
the River Dearne						water run-off from excavations. ▫ Undertaking refueling and oil changes within a physically bunded area with an impermeable base away. ▫ Careful siting of any excavated material away from adjacent drainsand the installation of interceptors and silt traps. ▫ CEMP or similar document will be produced for the construction works. ▫ Construction work will be undertaken in accordance with measures as stated under guidance such as the Environmental Alliance, Pollution Prevention Guidelines 6, 21 and 22 (SEPA, Environment Agency and EHSNI).						Barnsley Core Strategy	
Impacts to foraging and commuting otters - Disturbance	County	Negative	T	D	ST	▫ Lighting will be minimised and directed to avoid spill ▫ CEMP agreed before any construction activities taking place ▫ Night time working hours limited	Site	Negative	T	D	ST	PPS 9 Yorkshire and Humber Plan Barnsley Core Strategy	Wildlife and Countryside Act 1981 Conservation of Habitats and Species Regulations 2010
Impacts to foraging and commuting otters – Water quality	County	Negative	T	I	LT	▫ CEMP and WMP agreed beforehand will cover measures to control potential contamination of watercourses.	Not significant	Neutral	n/a	n/a	n/a	PPS 9 Yorkshire and Humber Plan Barnsley Core Strategy	Wildlife and Countryside Act 1981 Conservation of Habitats and Species Regulations 2010

Description of Likely Significant Effects	Significance of Impacts					Summary of Mitigation / Enhancement Measures	Significance of Residual Effects					Relevant Policy	Relevant Legislation
	Level of Impact	Positive / Neutral / Negative	(P/T)	(D/I)	ST/MT/LT)		Level of Impact	Positive / Neutral / Negative	(P/T)	(D/I)	ST/MT/LT)		
Spread of Invasive Weeds	Site	Negative	P	D	LT	▪ On-site or off-site treatment following recommended guidance	Not significant	Neutral	n/a	n/a	n/a		Wildlife and Countryside Act 1981 Environmental Protection Act 1990
Operational													
Impacts to roosting, foraging and commuting bats – Increases in artificial lighting	Regional	Negative	P	D	LT	▪ Avoidance of increase in artificial lighting levels on known roosting, foraging and commuting areas within the Site. ▪ Erection of a 2m high closeboard fence along the river banks.	Site	Positive	P	D	LT	PPS 9 Yorkshire and Humber Plan Barnsley Core Strategy	Wildlife and Countryside Act 1981 Conservation of Habitats and Species Regulations 2010
Impacts to roosting, foraging and commuting bats – Increases in noise and vibration	Regional	Negative	P	D	LT	▪ No public access allowed within 30m of the culvert entrance. ▪ 8m buffer maintained between the River Dearne and any development.	Not significant	Neutral	n/a	n/a	n/a	PPS 9 Yorkshire and Humber Plan Barnsley Core Strategy	Wildlife and Countryside Act 1981 Conservation of Habitats and Species Regulations 2010
Impacts to roosting, foraging and commuting bats – Damage/destruction of the bat roost.	Regional	Negative	P	D	LT	▪ Drainage systems designed to prevent surface water run-off entering the river and flooding the culvert and the bat roost.	Not significant	Neutral	n/a	n/a	n/a	PPS 9 Yorkshire and Humber Plan Barnsley Core Strategy	Wildlife and Countryside Act 1981 Conservation of Habitats and Species Regulations 2010
Impacts to foraging and commuting otters - Disturbance	County	Negative	P	D	LT	▪ Lighting will be minimised and directed to avoid spill	Not significant	Neutral	n/a	n/a	n/a	PPS 9 Yorkshire and Humber Plan Barnsley	Wildlife and Countryside Act 1981 Conservation of Habitats

Description of Likely Significant Effects	Significance of Impacts					Summary of Mitigation / Enhancement Measures	Significance of Residual Effects					Relevant Policy	Relevant Legislation
	Level of Impact	Positive / Neutral / Negative	(P/T)	(D/I)	ST/MT/LT)		Level of Impact	Positive / Neutral / Negative	(P/T)	(D/I)	ST/MT/LT)		
												Core Strategy	and Species Regulations 2010
Positive contributions towards long-term biodiversity gain						▫ Maintenance of the plantation woodland along the River Dearne to maintain dark corridor for bats. ▫ Provision of integral bat boxes into the new bridge over the River Dearne.	Site	Positive	P	D	LT	PPS 9 Yorkshire and Humber Plan Barnsley Core Strategy	

Key to table:

P/T = Permanent or Temporary, D/I = Direct or Indirect, ST/MT/LT = Short Term, Medium Term or Long Term

N/A = Not Applicable

12.11 REFERENCES

Documentary sources

Ref 12.1 Guidelines for Ecological Impact Assessment in the United Kingdom (IEEM, 2006)

Ref 12.2 European Commission (EC) (1992), Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora (EC Habitats Directive)

Ref 12.3 EC (1979), Council Directive 79/409/EEC on the Conservation of wild birds (EC Birds Directive)

Ref 12.4 HMSO (2010), *Conservation of Habitats and Species Regulations*

Ref 12.5 EC (1979), Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention)

Ref 12.6 EC (1983), *The Convention on the Conservation of European Wildlife and Natural Habitats* (Bern Convention);

Ref 12.7 EC (1992), *Convention on Biological Diversity*

Ref 12.8 HMSO Wildlife & Countryside Act 1981 (as amended)

Ref 12.9 HMSO Countryside and Rights of Way Act 2000

Ref 12.10 HMSO (2006), *Natural Environment and Rural Communities Act*

Ref 12.12 *Barnsley Core Strategy and Development Control Policies* (2010) Barnsley Metropolitan Borough Council

Ref 12.13 The Department for Communities and Local Government, National Planning Policy Framework, March 2012.

Ref 12.14 Planning Policy Statement (PPS) 9: Biodiversity and Geological Conservation 2005

Ref 12.15 ODPM (2005), *Circular 06/05: Biodiversity and Geological Conservation - Statutory Obligations and Their Impact Within the Planning System*

Ref 12.16 Barnsley Biodiversity Action Plan (Barnsley LBAP)

Ref 12.17 Institute of Environmental Assessment (1997) Guidelines for Baseline Ecological Assessment

Ref 12.18 Joint Nature Conservation Committee (1993) Handbook for Phase 1 Habitat Survey: A Technique for Environmental Audit

Ref 12.19 Eric Bennet (2004) *Old Mill Lane (A61) Culvert, Barnsley: Bat Survey.* Eric Bennett Consultancy Ltd.

Ref 12.20 BMBC (2011) *Old Mill Lane Culvert Bat Roost (Candidate site) NHS Assessment and Phase 1 Survey.* TEP

Ref 12.21 Wray, S., Wells, D., Long, E. & Mitchell-Jones, T. 2010. *Valuing Bats in Ecological Impact Assessment.* In Practice – December 2010. Pp. 23-25. Institute of Ecology and Environmental Management, Winchester.

Ref 12.22 EA (2009-2011) *Pollution Prevention Guidelines 5, 6, 21 and 22.* Environment Agency.

Ref 12.23 PPG5 *Works In, Near or Liable to Affect Watercourses*

Online Sources

National Biodiversity Network Gateway (NBN; www.searchnbn.net);

Multi-Agency Geographic Information for the Countryside (MAGIC; www.magic.gov.uk); and

Natural England's Nature on the Map (www.natureonthemap.org.uk).

12 APPENDICES: Ecology

APPENDIX 12.1: LEGISLATION POLICY AND GUIDANCE

LEGISLATION, POLICY AND GUIDANCE

1.1 SPECIES PROTECTION

1.1.1 A level of statutory protection is afforded to specific species; the various statutes of which provide this protection include the following:

- The Wildlife & Countryside Act (WCA) 1981;
- Countryside and Rights of Way (CROW) Act 2000;
- The Conservation of Habitats and Species Regulations 2010;
- Natural Environment and Rural Communities Act (NERC) 2006; and
- Wild Mammals (Protection) Act 1996.

Bats

1.1.2 All species of bat and their roosts are protected under the *WCA 1981* (as amended) and *The Conservation of Habitats and Species Regulations 2010*, which is the implementation of the EC Directive on the *Conservation of Natural Habitats and Flora and Fauna, 1992* (the Habitats Directive). This makes it illegal to:

- Intentionally kill, injure or take a bat;
- Damage or destroy a breeding site or resting place of a bat;
- Deliberately disturb a bat, including disturbance of a bat which is likely to:
    1. Impair their ability to survive, to breed or reproduce, to rear or nurture their young, or to hibernate or migrate.
    2. Affect significantly the local distribution or abundance of bats.
- Possess, transport or sell a bat.

1.1.3 A European Protected Species (EPS) licence can be issued by Natural England for scientific, research purposes (including survey work), and for the disturbance of bats in relation to a development. Licences can only be granted if there is no satisfactory alternative or if the action authorised will not be detrimental to the maintenance of the population of the species at a favourable conservation status in their natural range.

Otters

1.1.4 Otters are protected under the *WCA 1981* (as amended) and *The Conservation of Habitats and Species Regulations 2010*, which is the implementation of the EC Directive on the *Conservation of Natural Habitats and Flora and Fauna, 1992* (the Habitats Directive). This makes it illegal to:

- Intentionally kill, injure or take an otter;
- Damage or destroy a breeding site or resting place of an otter;
- Deliberately disturb an otter, including disturbance of an otter which is likely to:
    3. Impair their ability to survive, to breed or reproduce, to rear or nurture their young, or to hibernate or migrate.
    4. Affect significantly the local distribution or abundance of otters.
- Possess, transport or sell an otter.

1.1.5 An EPS licence can be issued by Natural England for the disturbance of otters in relation to a development. Licences can only be granted if there is no satisfactory alternative or if the action authorised will not be detrimental to the maintenance of the population of the species at a favourable conservation status in their natural range.

1.2 PLANNING POLICY

National Planning Policy

National Planning Policy Framework (NPPF) March 2012

1.2.1 Published in March 2012, the NPFF sets out the Governments planning policies for England.

1.2.2 The NPFF states that the planning system should contribute to and enhance the natural and local environment by:

- recognising the wider benefits of ecosystem services; and,
- minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures.

1.2.3 Planning policies and decisions should encourage the effective use of land by re-using land that has been previously developed (brownfield land), provided that it is not of high environmental value. Local planning authorities may continue to consider the case for setting a locally appropriate target for the use of brownfield land.

1.2.4 Local planning authorities should set criteria based policies against which proposals for any development on or affecting protected wildlife or geodiversity sites or landscape areas will be judged. Distinctions should be made between the hierarchy of international, national and locally designated sites, so that protection is commensurate with their status and gives appropriate weight to their importance and the contribution that they make to wider ecological networks.

1.2.5 Local planning authorities should:

- set out a strategic approach in their Local Plans, planning positively for the creation, protection, enhancement and management of networks of biodiversity and green infrastructure; and,
- maintain the character of the undeveloped coast, protecting and enhancing its distinctive landscapes, particularly in areas defined as Heritage Coast, and improve public access to and enjoyment of the coast.

1.2.6 Great weight should be given to conserving landscape and scenic beauty in National Parks, the Broads and Areas of Outstanding Natural Beauty, which have the highest status of protection in relation to landscape and scenic beauty. The conservation of wildlife and cultural heritage are important considerations in all these areas, and should be given great weight in National Parks and the Broads.

1.2.7 Planning permission should be refused for major developments in these designated areas except in exceptional circumstances and where it can be demonstrated they are in the public interest. Consideration of such applications should include an assessment of:

- the need for the development, including in terms of any national considerations, and the impact of permitting it, or refusing it, upon the local economy;
- the cost of, and scope for, developing elsewhere outside the designated area, or meeting the need for it in some other way; and,
- any detrimental effect on the environment, the landscape and recreational opportunities, and the extent to which that could be moderated.

1.2.8 To minimise impacts on biodiversity and geodiversity, planning policies should:

- plan for biodiversity at a landscape-scale across local authority boundaries;

- identify and map components of the local ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity, wildlife corridors and stepping stones that connect them and areas identified by local partnerships for habitat restoration or creation;
- promote the preservation, restoration and re-creation of priority habitats, ecological networks and the protection and recovery of priority species populations, linked to national and local targets, and identify suitable indicators for monitoring biodiversity in the plan; and,
- where Nature Improvement Areas are identified in Local Plans, consider specifying the types of development that may be appropriate in these Areas.

1.2.9 When determining planning applications, local planning authorities should aim to conserve and enhance biodiversity by applying the following principles:

- if significant harm resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;
- proposed development on land within or outside a Site of Special Scientific Interest likely to have an adverse effect on a Site of Special Scientific Interest (either individually or in combination with other developments) should not normally be permitted. Where an adverse effect on the site's notified special interest features is likely, an exception should only be made where the benefits of the development, at this site, clearly outweigh both the impacts that it is likely to have on the features of the site that make it of special scientific interest and any broader impacts on the national network of Sites of Special Scientific Interest;
- development proposals where the primary objective is to conserve or enhance biodiversity should be permitted;
- opportunities to incorporate biodiversity in and around developments should be encouraged;
- planning permission should be refused for development resulting in the loss or deterioration of irreplaceable habitats, including ancient woodland and the loss of aged or veteran trees found outside ancient woodland, unless the need for, and benefits of, the development in that location clearly outweigh the loss; and,
- the following wildlife sites should be given the same protection as European sites:
  - potential Special Protection Areas and possible Special Areas of Conservation;
  - listed or proposed Ramsar sites; and
  - sites identified, or required, as compensatory measures for adverse effects on European sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites.

1.2.10 The presumption in favour of sustainable development does not apply where development requiring appropriate assessment under the Birds or Habitats Directives is being considered, planned or determined.

1.2.11 By encouraging good design, planning policies and decisions should limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.

1.2.12 Planning law requires that applications for planning permission must be determined in accordance with the development plan, unless material considerations indicate otherwise. The National Planning Policy Framework must be taken into account in the preparation of local and neighbourhood plans, and is a material consideration in planning decisions. Planning policies and decisions must reflect and where appropriate promote relevant EU obligations and statutory requirements.

Planning Policy Statement (PPS) 9: Biodiversity and Geological Conservation

1.2.13 PPS 9 sets out the Government's national planning policies on protection of biodiversity through the planning system. These policies are incorporated into development planning documents at regional and

local scales, and are also of material worth in considering individual planning applications. There is a sequential approach to biodiversity in the planning process set out in Key Principles I (vi), which is as follows:

- Avoidance of harm;
- Consideration of reasonable alternatives;
- Mitigation where harm cannot be avoided;
- Compensation where impacts cannot be prevented or adequately mitigated against; and;
- *"if that significant harm cannot be prevented, adequately mitigated against, or compensated for, then planning permission should be refused."*

1.2.14 PPS 9 places particular emphasis upon natural habitat types that are recognised as being of principal importance (under Section 41, NERC Act 2006), and advises that opportunities to enhance and extend these are desirable; and that development proposals incorporating good design that provide new opportunities for the enhancement of biodiversity at a site are viewed favourably by the local planning authorities.

Local Planning Policy

Barnsley Core Strategy

1.2.15 The BCS provides a spatial strategy for the future development of Barnsley up to the year 2026. The Core Strategy sets out the key elements of the planning framework for Barnsley, and the approach to its long term physical development. The BCS went through a process of public consultation between February and April 2010.

1.2.16 Within the BCS the following policies are relevant to the assessment:

- CSP 33 – Green Infrastructure states that:

  "We will create, maintain and enhance an integrated network of connected and multi-functional open spaces that:

  - *provides attractive environments where people want to live, work, learn, play, visit and invest;*
  - *meets the environmental, social and economic needs of communities across the borough and the wider City Regions;*
  - *enhances the quality of life for present and future residents and visitors;*
  - *helps to meet the challenge of climate change;*
  - *enhances biodiversity and landscape character;*
  - *improves opportunities for recreation and tourism;*
  - *respects local distinctiveness and historical and cultural heritage; and*
  - *maximises potential economic and social benefits.*

  At a strategic level Barnsley's Green Infrastructure network includes the following corridors which are shown on the Green Infrastructure Diagram 5:

  - *River Dearne Valley Corridor;*
  - *River Dove Valley Corridor;*
  - *River Don Valley Corridor;*
  - *Dearne Valley Green Heart Corridor; and*
  - *Historic Landscape Corridor.*

  The network of green infrastructure will be secured by protecting open space, creating new open spaces as part of new development, and by using developer contributions to create and improve green infrastructure.

We will produce a Green Infrastructure Strategy for Barnsley which will be informed by the Leeds City Region and South Yorkshire Green Infrastructure Strategies".

- CSP 34 – Protection of Green Belt states that;

  "The general extent of the Green Belt is shown on the Core Strategy Key Diagram.

  Its detailed boundaries will be shown on the Proposals Maps which will accompany the Development Sites and Places DPD.

  In order to protect the countryside and open land around built up areas the extent of the Green Belt will be safeguarded and remain unchanged.

  The Green Belt boundaries will be subject to localised review only which may result in changes necessary to deliver the Borough's spatial strategy.

  Development in the Green Belt must meet the requirements of PPG2".

- CSP 35 – Green Space states that;

  "We will work with partners to improve existing green space to meet the standards in our Green Space Strategy.

  Green space refers to any land within or close to towns and village that is or could be used by people for recreation or by wildlife.

  We will only allow development proposals that result in the loss of green space where:

  - *an assessment shows that there is too much of that particular type of green space in the area which it serves and its loss would not affect the existing and potential green space needs of the borough; or*
  - *an appropriate replacement green space of at least an equivalent community benefit, accessibility and value is provided in the area which it serves; or*
  - *the development is for small scale facilities needed to support or improve the proper function of the green space.*

  We will assess the need for green space against the standards in our Green Space Strategy".

- CSP 36 – Biodiversity and Geodiversity states that.

  "Development will be expected to conserve and enhance the biodiversity and geological features

  of the Borough by:

  - *protecting and improving habitats, species, sites of ecological value and sites of geological value with particular regard to designated wildlife and geological sites of international, national and local significance, ancient woodland and species and habitats of principal importance identified in Section 74 of the Countryside and Rights of Way Act 2000 and in the Barnsley Biodiversity Action Plan;*
  - *maximising biodiversity and geodiversity opportunities in and around new developments; and*
  - *conserving and enhancing the form, local character and distinctiveness of the river corridors of the Dearne and Dove as natural floodplains and important strategic wildlife corridors.*

  Development which may harm a biodiversity or geological feature will not be permitted unless effective mitigation and/or compensatory measures can be ensured".

APPENDIX 12.2: EXTENDED PHASE 1 HABITAT SURVEY



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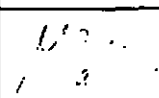
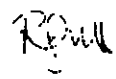
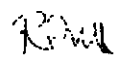
WSP

Title: Old Mill Lane, Barnsley, South Yorkshire: Extended Phase 1 Habitat Survey

Client: Peel Holdings

Date: November 2011

QUALITY MANAGEMENT

Issue/revision	Issue 1	Revision 1	Revision 2	Revision 3
Remarks				
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Signature				
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Signature				
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EXECUTIVE SUMMARY

Site Name	Old Mill Lane, Barnsley
Site Location	Old Mill Lane, Barnsley, South Yorkshire National Grid Reference SE 351 072
Survey Type	Extended phase 1 habitat survey
Survey Date	5 May 2011
Site Description	Site is approximately 6.5 hectares in size, consisting of numerous buildings, broadleaved plantation woodland, bare ground, hard standing and flowing water (River Dearne).
Species Present	Daubenton's bats (*Myotis daubentonii*)
Species Potentially Present	Other bat species Otters (*Lutra lutra*) Water vole (*Arvicola amphibious*)
Ecological Constraints	Roosting bats in a culvert within the site adjacent to River Dearne. Nesting birds.
Recommendations for Further Survey Work	Bat emergence surveys of the culvert. Bat activity surveys of the site. Water vole and otter survey of the River Dearne

1 INTRODUCTION

1.1 BASELINE

1.1.1 WSP Environmental Limited (WSPE) was instructed by Peel Holdings (the client) to undertake an extended Phase 1 habitat (Institute of Environmental Assessment (IEA, 1995) and Joint Nature Conservation Committee (JNCC), 2007) of an area of land (the Site) situated at Old Mill Lane, Barnsley, South Yorkshire proposed for future redevelopment into mixed use.

1.1.2 The extended Phase 1 habitat survey was undertaken on 5th May 2011 by Matt Oakley, Senior Ecologist with WSPE, which included the mapping of vegetation and preparation of Target Notes (TN), to provide a broad habitat inventory for the Site and inform the need for any necessary subsequent protected species surveys or other important species and habitat surveys.

1.1.3 The aim of this study is to:

- Undertake a desk-top study to identify any existing information regarding protected habitats and species within a defined radius of the Site;
- To carry out a Site survey to provide a description of the existing broad habitat types, and to identify the presence or potential presence of any protected species;
- Produce a report detailing the findings of the desk-top study and the Site survey, including any key ecological constraints to the proposed development;
- Provide recommendations for further necessary ecological survey work, and any mitigation measures required; and
- Identify any enhancement measures that may be available.

1.1 SITE OVERVIEW AND DETAILS OF THE PROPOSALS

1.1.1 The Site is centred on National Grid Reference SE 351 072and covers an area of approximately 6.5 hectares (ha) (see **Figure 12.1** for Site boundary). The Site is bordered to the west by Old Mill Lane, to the south by Twibell Street, to the north by Burton Road and to the east by Dearne Valley Country Park. The Site is set within the urban landscape of Barnsley with both residential and commercial developments in close proximity to the Site. To the west of the Site is The Fleets, a lake next to the River Dearne, and to the east is the Dearne Valley Country Park which consists of a mix of grassland, woodland and ponds..

1.1.2 The Site includes numerous buildings, broad leaved plantation woodland, bare ground, hardstanding and the River Dearne.

1.1.3 The client's aspiration is to redevelop the Site into mixed use.

1.2 STUDY LIMITATIONS

1.2.1 The extended Phase 1 habitat survey was undertaken during the optimal period (April to September) and therefore the type of habitats present and the plant species recorded at the time of the survey are sufficient to allow a robust classification of the value of each habitat type to be made.

1.2.2 Species lists included in the extended Phase 1 habitat survey TN's are not necessarily an exhaustive inventory of all species occurring at the Site. They are intended to illustrate the general species-richness of a particular area, and draw attention to any species that may be considered uncommon or unusual.

1.2.3 General notes and limits pertaining to ecological surveying are provided in **Appendix A**.

2 METHODOLOGY

2.1 OVERVIEW

2.1.1 The study comprised two phases: a desk study consultation exercise and field survey comprising an extended Phase 1 habitat survey. By combining the two phases it is possible to identify and evaluate the ecological value of the Site in order to determine the potential impacts of the re-development of the Site.

2.2 DESK STUDY

2.2.1 The purpose of the desk study is to review information available in the public domain and to obtain information held by statutory and non-statutory consultees. Information was requested for the Site and an area within a 2 kilometre (km) radius of the Site as recommended in the Institute of Environmental Assessment's '*Guidelines for Baseline Ecological Assessment*' (1997). This was extended to 5km as recommended in the *Bat Mitigation Guidelines* (English Nature, 2004).

2.2.2 Information was requested from the following organisations:

- Yorkshire Wildlife Trust (YWT);
- Barnsley Metropolitan Borough Council (BMBC);
- South Yorkshire Bat Group (SYBG); and
- The Environment Agency (EA).

2.2.3 The following meta-databases were searched for information regarding protected habitats and species:

- NBN (National Biodiversity Network) Gateway;
- MAGIC (Multi-Agency Geographic Information for the Countryside); and
- Nature on the Map – http://www.natureonthemap.org.uk.

2.2.4 The following report detailing previous survey work undertaken at the Site has been reviewed:

- *Old Mill Lane (A61) Culvert, Barnsley: Bat Survey* (Eric Bennett Consultancy, 2004); and
- *Old Mill Lane Culvert Bat Roost Site (Candidate Site): NHS Assessment and Phase 1 Survey* (TEP, 2011).

2.3 FIELD SURVEY

2.3.1 The field survey of the Site was conducted on 5th May 2011.

Extended Phase 1 habitat survey

2.3.2 The extended Phase 1 habitat survey of the Site aims to record the broad habitat types present, as well as identify any evidence of protected or notable species, or habitat with the potential to support such species. This is achieved through direct observation and through searching for field signs for each species (IEA, 1995).

2.3.3 The dominant plant species were recorded and habitats classified according to their vegetation types and presented in the standard Phase 1 habitat survey format (JNCC, 2007). TN's were made on species and habitats of conservation interest.

2.3.4 Evidence of any species protected by law, or other species of particular conservation interest was recorded where they were found during the field surveys. Because of the habitats present on Site, special attention was paid to the potential suitability for the following species:

- Bats (*Chiroptera*);
- Otter; and
- Water vole.

Bat Roost Potential Assessment

2.3.5 Seven buildings on Site (TN1-7) were assessed by a licenced bat worker (licence number 20102281) to determine their potential to support roosting bats. The survey was commensurate with good practice, following the guidance set out in *Bat Surveys Good Practice Guidelines* (BCT, 2007). Each building was classified as having either negligible, low, moderate, high potential, or as a confirmed bat roost, dependent upon the features of the building. These features include gaps under roof and ridge tiles, and around leaf flashing; holes in the roof or gable end of the building; and gaps under the eaves.

2.3.6 All buildings were externally assessed. None of the buildings exhibited any potential to support roosting bats and therefore no internal survey of any of the buildings was undertaken.

2.3.7 The criteria for assessing the potential of each building to support roosting bats are outlined below in Table 1.

Table 1: Criteria for Bat Roost Potential Assessment of Buildings

Bat Roost Potential	Description
Negligible	The structure lacks any features suitable for roosting bats.
Low	The structure may have some interest to roosting bats, i.e external roosting features such as fascia or soffit boards, but is considered to be sub-optimal to the extent that bats would not be anticipated to use it.
Moderate	The structure exhibits features suitable to be for use by roosting bats, such as internal and external cavities well insulated from external weather conditions, but is less than ideal in some way. It may be situated in less than ideal habitat, lacking suitable commuting corridors.
High	The structure exhibits a number of features suitable for use by roosting bats i.e numerous roosting opportunities such as dark, enclosed roof voids; the structure has a high degree of connectivity with likely navigation routes; and the building is located within suitable foraging habitat, likely to be noticed by commuting bats.
Confirmed	Positive signs of bats are recorded within the structure (internally or externally), such as individual bats or bat droppings.

2.3.8 Mature trees on Site were assessed for their potential to support roosting bats, following the guidance set out in *Bat Surveys Good Practice Guidelines* (BCT, 2007). Each tree was categorised according to the BCT guidelines based upon the features of the tree, taken to include cracks, splits and holes in the truck and branches, as well as a covering of dense ivy.

2.3.9 The criteria for assessing the potential of each building to support roosting bats are outlined below in Table 2.

Table 2: Criteria for Bat Roost Potential Assessment of Structure

Tree Category	Description
1	Confirmed bat roost tree with field evidence of the presence of bats, e.g. droppings, scratch marks, grease marks or urine staining.
2a	Trees that have a high potential to support bat roosts - the tree exhibits a number of features suitable for use by roosting bats i.e numerous roosting opportunities such as dark, enclosed upward leading cavities and the tree has a high degree of connectivity with likely navigation routes.
2b	Trees with a moderate/low potential to support bat roosts - the tree exhibits features suitable to be for use by roosting bats, such as holes and cracks in the truck, but is less than ideal in some way.
3	Trees with negligible potential to support bat roosts – the tree lacks features suitable for use by bats to the extent that bats would not be anticipated to use it.

2.4 LEGISLATIVE BACKGROUND

2.4.1 Relevant legislation pertaining to the Proposed Development of the Site and the species either present or potentially present is detailed in **Appendix B**.

3 RESULTS

3.1 DESK STUDY

Statutory Sites

3.1.1 No internationally or nationally designated sites are present within 2km of the Site.

3.1.2 Dearne Valley Park Local Nature Reserve (LNR) is situated adjacent to the eastern Site boundary. The reserve has been developed from relict habitats and reclaimed colliery around the river valley. The reserve consists of ancient acidic oak woodland, mixed plantation and willow dominated woodland, as well as areas of open grassland and scrub and a mosaic of wetland habitats including two ponds.

Non-statutory Sites

3.1.3 Two Local Wildlife Sites (LWS) and one proposed LWS are present within 2km of the Site, which are detailed below in Table 3:

Table 3:Details of LWS within 2km of Site

Designated Site	Status	Distance and Direction from the Site	Summary
Old Mill Lane Culvert Bat Roost	Candidate LWS	Within Site	Nationally important Daubentons bat roost within Old Mill Lane culvert adjacent to the River Dearne which flows through the Site. Peak count of 412 bats recorded in 1990.
Cliffe Wood	LWS	0.35km east	The site is a mosaic of habitats including woodland, scrub, grassland, marsh and open water. Much of the woodland is a good example of oak/birch woodland and there are areas of representative willow carr.
Barnsley Canal at Wilthorpe	LWS	0.7km north west	The site includes a stretch of the canal, part of the old course of the river, swamp and grassland. The site supports an assemblage of breeding and over wintering birds and the area supports populations of amphibians such as common toad, common frog and smooth newt. Great created newt have also been reported at Willowbank.

Protected Species

3.1.4 The following protected species relevant to the scheme have been recorded within the Desk Study Search Area:

Otters

3.1.5 Otters have been recorded on the River Dearne 700 metres (m) north west of the Site in 2007. They have also been recorded 3.2km south east of the Site.

Bats

3.1.6 SYBG provided records of bats within 5km of the Site, as recommended by the *Bat Mitigation Guidelines* (English Nature 2004). The following species have been recorded:

- Daubentons bat – a roost of over 400 bats has been recorded within the Site since the 1990's;

- Soprano pipistrelle (*Pipistrellus pygmaeus*);
- Common pipistrelle bat (*Pipistrellus pipistrellus*); and
- Brown long-eared bat (*Plecotus auritus*).

3.1.7 A number of consultees have provided details of the Daubentons bat roost located within the culvert adjacent to the River Dearne in the south west of the Site (**see Figure 12.2**).

3.1.8 The brick culvert is approximately 2m wide, 1.5m high and 90m long, running from the River Dearne banks adjacent to the Old Mill Lane road bridge within the Site (Eric Bennett 2004). The head of the culvert lies beneath the entrance threshold to the former gas site. The roost chamber itself is hidden between the tarmac road surface and the roof of the culvert approximately 1.04m below the road surface, although the exact size of the roost chamber is currently unknown. The bats gain access to the roost chamber through small openings in a manhole type feature in the culvert roof.

3.1.9 In addition there are five small and much older stone culverts leading off the main culvert and crossing beneath Old Mill Lane (see **Figure 12.2**).

3.1.10 A number of monitoring surveys have undertaken at this Site since 1990 when the bat roost was first discovered. The counts have been summarised below in Table 4:

Table 4:Peak counts of Daubentons bats within culvert

Year	Peak Count (individual bats)	Surveyor
1990	412	National Bat Monitoring Programme
1991	325	National Bat Monitoring Programme
1992	316	National Bat Monitoring Programme
1993	309	National Bat Monitoring Programme
1994	286	National Bat Monitoring Programme
1995	266	National Bat Monitoring Programme
1996	196	National Bat Monitoring Programme
1997	261	National Bat Monitoring Programme
1998	No records	National Bat Monitoring Programme
1999	258	National Bat Monitoring Programme
2000	304	National Bat Monitoring Programme
2001	No records	National Bat Monitoring Programme
2002	257	National Bat Monitoring Programme
2003	293	National Bat Monitoring Programme
2010 (September)	67	TEP (on behalf of BMBC)
2011	82	Eric Bennett

3.1.11 There is no evidence that the bats use the culvert in the winter months due to the fact that during high water levels the culvert floods.

Fish

3.1.12 The EA provided records for the River Dearne 2km east of the Site between 2007 and 2010. Species recorded here are:

- Barbel (*Barbus barbus*);
- Common bream (*Abramis brama*);
- Brown trout (*Salmo trutta morpha fario*);
- Bullhead (*Cottus gobio*);
- Chub (*Leuciscus cephalus*);
- Dace (*Leuciscus leuciscus*);
- Gudgeon (*Gobio gobio*);
- Minnow (*Phoxinus phoxinus*);
- Roach (*Rutilus rutilus*);
- Stone loach (*Barbatula barbatula*);
- Perch (*Perca fluviatillis*); and
- Pike (*Esox lucius*).

Aquatic Invertebrates

3.1.13 The EA provided records for the River Dearne 700m north west of the Site between 1995 and 2010. The lowest Biological Monitoring Working Party (BMWP) score recorded was 30 (May 1995) and the highest was 105 (May 2009). The BMWP is an index for measuring the biological quality of rivers using species of macroinvertebrates as biological indicators. Since 2008, the scores recorded have been 77, 101, 105, 95 and 75, with an average BMWP score of 90.6. This score equates to a river quality of Good, clean but slightly impacted.

White clawed crayfish

3.1.14 Trevor Mayne BMBC Biodiversity Officer supplied details of white-clawed crayfish (*Austropotamobius pallipes*) surveys that were undertaken by the county recorder in 2010 of the River Dearne at both the Site, and upstream and downstream of the Site. No white-clawed crayfish were recorded during these surveys, and combined with the fact that signal crayfish have been recorded within the River Dearne, and the history of pollution within the River Dearne, white-clawed crayfish are not thought to be present within the River Dearne in Barnsley.

Flora and Habitats

3.2 FIELD SURVEY

3.2.1 The Site comprises of the following habitats:

- River Dearne (G2);
- Broad-leaved plantation woodland (A1.2);
- Hardstanding;
- Buildings (J3.6); and
- Bare ground (J4).

Habitat descriptions

3.2.2 The survey results below should be read in association with the extended Phase 1 habitat map (**Figure 12.1**). These descriptions are based on the findings of the May 2011 survey.

River Dearne (G2)

3.2.3 The River Dearne flows west to east through the centre of the Site. At the western end of the Site, where the river flows into the Site underneath Old Mill Lane, the River Dearne is shallow and fast flowing with a substrate

consisting of rocks and boulders. There is a culvert on the northern bank of the river adjacent to the bridge which is known to support a large Daubentons bat roost (TN1).

3.2.4 From the western boundary of the Site up until the gas holder (TN2) on the southern bank the river is confined within tall retaining walls, thereafter the river is within more naturally vegetated banks. The whole section is thickly covered with trees, mostly Sycamore (*Acer pseudoplatanus*) and alder (*Alnus glutinosa*) overhanging and shading the river and creating a tunnel effect.

3.2.5 As the River Dearne flows east through the Site the channel becomes wider and deeper and the banks are dominated by scrub and marginal aquatic plants such as common reed (*Phragmites australis*) and meadowsweet (*Filipendula ulmaria*). Invasive species Japanese knotweed (*Fallopia japonica*), giant hogweed *(Heracleum mantegazzianum*) and Himalayan balsam (*Impatiens glandulifera*) are all present growing on the banks of the River Dearne towards the eastern end of the Site (TN3).

3.2.6 The River Dearne as it flows through Barnsley has been classified as being of Good quality following Biological Monitoring Working Party (BMWP) guidance.

Broad-leaved plantation woodland (A1.2)

3.2.7 A strip of broad-leaved woodland is present along the northern and southern banks of the River Dearne. The main species present are alder, willow (*Salix* sp.) and sycamore, many of which overhang the river channel. The ground flora is relatively sparse here due to the density of the woodland canopy.

Hardstanding

3.2.8 Areas of hardstanding are present throughout the Site south of the River Dearne associated with the buildings, which has no ecological value.

Buildings (J3.6)

3.2.9 Five warehouses are present south of the River Dearne (TN4-8), along with the gas holder at the centre of the Site and a small brick built electrical substation (TN9) adjacent to the western boundary of the Site. These buildings were assessed for their potential to support roosting bats and have all been classified as having Negligible potential due to them lacking any suitable features such as roof voids, or gaps beneath loose roof and ridge tiles and gaps behind lead flashing.

Bare ground

3.2.10 During the extended Phase 1 habitat survey undertaken in April 2011 construction of the road to access the proposed development had already commenced and therefore the majority of the Site north of the River Dearne consists of bare ground with the associated construction materials and plant and equipment.

Species

Bats

3.2.11 All of the buildings within the Site were classified as having Negligible potential to support roosting bats.

3.2.12 All of the trees within the Site were classified as Category 3 trees (BCT 2007) meaning they all have Negligible potential to support roosting bats.

3.2.13 The culvert adjacent to the River Dearne is known to support a large Daubentons bat roost, with peak counts of 400 bats recorded.

3.2.14 The River Dearne and the plantation woodland along its bank provide good foraging habitat for bats,

Birds

3.2.15 The Site does not possess any features that would suggest it would be of any special ornithological value. The small strip of broad leaved plantation woodland is likely to be used by small numbers of commoner nesting bird species. The buildings also provide nesting locations, although no evidence of this was recorded during the extended Phase 1 habitat survey undertaken in April 2011.

3.2.16 The River Dearne provides suitable foraging habitat for kingfisher (*Alcedo atthis*), although given the lack of suitable overhanging banks it is unlikely that this species breeds within the Site. No records of this species being present within 2km of the Site were returned during the 2011 desk study consultation.

Water vole

3.2.17 The River Dearne provides sub-optimal habitat for this species. The western end of the rivers banks have been reinforced with metal sheeting on both sides making it unsuitable for this species. The eastern end of the River Dearne, as it flows towards the Dearne Valley Country Park becomes more vegetated, providing more opportunities for this species to burrow and forage.

Otter

3.2.18 The River Dearne provides an optimal dark corridor of movement through the landscape for this species, which is known to have linear territories of up to 40km for males. There is no suitable locations for an otter breeding holt either within or adjacent to the Site.

Other species

3.2.19 No evidence of any other protected species was recorded within or adjacent to the Site.

4 EVALUATIONS AND RECOMMENDATIONS

4.1 EVALUATION

Protected Sites and Habitats

4.1.1 Dearne Valley Park LNR is adjacent to the eastern boundary of the Site, and Cliffe Wood and Barnsley Canal at Wilthorpe are within 0.35km and 0.7km of the Site boundary respectively. The proposed development will not have any direct impact upon any of these sites. It is not anticpated that any significant impacts to these sites would occur during the operational phase of the proposed development.

4.1.2 The River Dearne provides habitat for bats, including the large Daubentons bat roost known to be present within the Site, and otters. Rivers are also a United Kingdom Biodiversity Action Plan priority habitat. Measures will need to be undertaken to protect this habitat during both the construction and operational phases of the proposed development.

4.1.3 The woodland strip along the River Dearne provides a dark corridor of movement along the River Dearne and this habitat should be retained within any development proposals for the Site.

Species

4.1.4 The Site is known to support roosting Daubentons bats.

4.1.5 The habitats on Site have the potential to support the following legally protected species:

- Other bat species;
- Water vole;
- Otter; and
- Birds.

4.1.6 The culvert supports roosting bats. Further survey work will need to be undertaken to determine the exact numbers of roosting bats in this location, along with the potentially significant foraging areas and commuting routes within the Site.

4.1.7 The River Dearne has potential to be used by commuting otters, as recent records exist of this species both west and east of the Site.

4.1.8 The River Dearne provides sub-optimal habitat for water vole and no records exist for this species within 2km of the Site. It is unlikely that water vole are present within the Site.

4.1.9 A number of common bird species are likely to breed in the area and an indicative species list has been compiled during the Phase 1 habitat survey. Although this does not constitute a full breeding bird survey, thelevel of baseline information gathered for this assessment is considered to be appropriate to the scale of the potential impacts to breeding birds.

Impacts

4.1.10 Bats and their roosts are protected from disturbance, damage and destruction under the *The Conservation of Habitats and Species Regulations 2010*. Attention will need to be paid to the presence of bats within on the culvert on Site, to comply with existing legislation. The loss of any roosts could affect future juvenile recruitment to the local bat population.

4.1.11 Otters and their places of shelter are also protected from disturbance, damage and destruction under the *The Conservation of Habitats and Species Regulations 2010*. Attention will need to be paid to the potential presence of otters commuting along the River Dearne to comply with existing legislation. Increases in lighting and noise disturbance in the vicinity of the river could prevent otters commuting through the site to reach favoured breeding or foraging sites.

4.1.12 Site clearance activity could also lead to the destruction of bird's nests depending upon what time of year this takes place. All species of wild birds and their nests are protected, with Schedule 1 birds receiving extra protection, under the *Wildlife & Countryside Act, 1981*.

4.2 RECOMMENDATIONS

Bats

4.2.1 Further survey work should be undertaken to determine the value of the Site for bat species. Emergence surveys of the culvert should be undertaken, with two to three surveys being carried out between May and September to record any potential maternity (breeding) roosts. The loss of any roost will need to be compensated for within the development of the Site, typically on a like for like basis. Any work affecting a roost will need to be carried out under the provision of a European Protected Species licence granted by Natural England.

4.2.2 It is recommended that two bat activity surveys are also undertaken to determine the location of any potentially significant foraging or commuting locations within the Site. These surveys should be undertaken between April and September and could be undertaken immediately following the emergence surveys.

Otter and Water Vole

4.2.3 An otter survey should be undertaken on the River Dearne to determine if the river is used by commuting otters. This survey involved searching the banks of the river for signs of otter presence such as spraints, prints, feeding remains and slides. Whilst undertaking the otter survey it is also recommended that signs of water vole presence are searched for which include burrows, latrines and feeding remains.

4.2.4 The otter survey can be undertaken at any time of the year, though it is recommended that this survey is undertaken between April and September during the optimal time to record water vole presence.

Birds

4.2.5 As a general recommendation, buildings and vegetation should be removed outside of the bird breeding season, which is generally considered to be March to August inclusive. If this is not possible then buildings and vegetation should be checked immediately prior to removal by a suitably qualified ecologist. Any active nests identified must be retained with a 5m buffer until such time as the nest is deemed, by a suitably qualified ecologist to be no longer supporting young.

4.2.6 Artificial nesting sites, such as nest boxes, should be provided within the proposals, and swift boxes could be installed on new buildings to provide nesting sites for this declining species.

General Recommendations

4.2.7 Wherever possible mature trees should be retained, in particular native species that supports invertebrate communities which in turn provide a foraging resource for bats and birds. This habitat is not easily replaceable, without extensive cost.

4.2.8 Native planting with wildlife friendly species around the Site will enhance the value of the Site to invertebrate species which in turn will increase foraging opportunities for bats and birds.

4.2.9 Increases in artificial lighting should be avoided in the vicinity of the River Dearne to maintain it viability as a foraging site for bats and commuting route for otters and bats.

5 REFERENCES

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Figure 12.1 Extended Phase 1 Habitat Survey

TARGET NOTES

1 Culvert containing Daubentons bat roost;
2 Gas holder;
3 River Dearne with Japanese knotweed, giant hogweed and Himalayan balsam;
4 Warehouse building;
5 Warehouse building;
6 Warehouse building;
7 Warehouse building;
8 Warehouse building; and
9 Electrical substation.

Figure 11.1



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PROJECT Old Mill Lane, Barnsley
PROJECT No 20470
CLIENT Peel Holdings PLC

DRAWN GH
CHECKED MO
APPROVED MO
REVISION A
DATE October 2011

WSP

Appendix A Notes and Limitations

WSP Environmental staff and their sub-consultants have endeavoured to identify the presence of protected species wherever possible on site, where this falls within the agreed scope of works.

Up to date standard methodologies have been used, which are accepted by Natural England (previously English Nature) and other statutory conservation bodies. No responsibility will be accepted where these methodologies fail to identify all species on site. WSP cannot take responsibility where Government, national bodies or industry subsequently modify standards.

The results of the survey and assessment work undertaken by WSP Environmental were representative at the time of surveying.

WSP Environmental has advised on the optimum survey season for a particular habitat/species prior to undertaking the survey work. However, WSP Environmental cannot accept responsibility for the accuracy of surveys undertaken outside this period.

WSP Environmental cannot accept responsibility for data collected from third parties.

Appendix B Legislative Background

Bats

All species of bat and their roosts are protected under the Wildlife and Countryside Act (WCA) 1981 (as amended) and The Conservation of Habitats and Species Regulations 2010, which is the implementation of the EC Directive on the Conservation of Natural Habitats and Flora and Fauna, 1992 (the Habitats Directive). This makes it illegal to:

- Intentionally kill, injure or take a bat;
- Damage or destroy a breeding site or resting place of a bat;
- Deliberately disturb a bat, including disturbance of a bat which is likely to:
  - Impair their ability to survive, to breed or reproduce, to rear or nurture their young, or to hibernate or migrate.
  - Affect significantly the local distribution or abundance of bats.
- Possess, transport or sell a bat.

Breeding and resting sites of bats, commonly called roosts, are defined as 'any structure or place which is used for shelter or protection', irrespective of whether bats are resident.

In addition to these pieces of legislation, further protection is afforded to bats by 'An Agreement on the Conservation of Bats in Europe' (under the Bern Convention) to which the United Kingdom Government is a signatory. This Agreement places obligations on the Government to protect important bat roosts or foraging areas.

The United Kingdom (UK) Biodiversity Action Plan (BAP) forms part of the UK government's commitment to conserve and enhance national biodiversity following the Rio Convention on Biodiversity in June 1992. The UK BAP Framework describes the UK's biological resources and commits a detailed plan for the protection of these resources. Three types of action plan (Species Action Plans (SAPs), Habitat Action Plans (HAPs) and Local Biodiversity Action Plans (LBAPs)) have been developed which set priorities for nationally and locally important habitats and wildlife.

Wild birds

All species of wild bird and their nests are protected under the WCA 1981 (as amended by the Countryside and Rights of Way Act 2000). This makes it illegal to:

- Intentionally kill, injure or take any wild bird;
- Intentionally take, damage or destroy the nest of any wild bird while that nest is in use or being built; and
- Intentionally take or destroy an egg of any wild bird.

Schedule 1 of the Act contains a list of birds which are conferred extra protection. Under the legislation it is illegal to:

- Intentionally or recklessly disturb a Schedule 1 bird whilst it is building a nest or is in or near a nest containing eggs or young; and
- Intentionally or recklessly disturb dependent young of such a bird.

Water vole

5.1.2 The water vole is fully protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). The legislation makes it an offence to:

- Intentionally kill, injure or capture a water vole;
- Possess or control a live or dead water vole, or any part of a water vole or anything derived from a water vole;
- Intentionally or recklessly damage, destroy or obstruct access to any structure or place which a water vole uses for shelter or protection – whether occupied or not; and

- Sell, possess or transport a water vole for the purpose of sale, and advertising the buying or selling of a water vole.

5.1.3 The Statutory Nature Conservation Organisation (SNCO) (in this case Natural England) and the Environment Agency should be consulted when any development or maintenance works may affect a water vole population. The SNCO will not issue licences specifically to cover development or waterway maintenance activities in respect to water vole populations. If works cannot be reasonably avoided then the "*incidental result of an otherwise lawful action*" defence will need to be relied upon which provides for the carrying out of lawful operations from which some harm to the species would otherwise be an offence. Attention must be paid to the presence of water voles and as far as is reasonable appropriate action taken to safeguard the animals and the places they use for shelter and protection. If after all options for conserving the water vole population have been considered, that the best outcome for water voles is capture and translocation to a different location, then this action is considered by the SNCO to be outside the scope of the defence. This is because the intentional capture of water voles is unlikely to be considered *incidental* and therefore a conservation licence will need to be obtained from SNCO if it is deemed that the translocation will produce a net conservation benefit to the water vole population concerned.

Otters

5.1.4 Otters are protected under the *Wildlife and Countryside Act 1981* (as amended) and *The Conservation of Habitats and Species Regulations 2010*, which is the implementation of the EC Directive on the *Conservation of Natural Habitats and Flora and Fauna, 1992* (the Habitats Directive). This makes it illegal to:

- Intentionally kill, injure or take an otter;
- Damage or destroy a breeding site or resting place of an otter;
- Deliberately disturb an otter, including disturbance of an otter which is likely to:
    1. Impair their ability to survive, to breed or reproduce, to rear or nurture their young, or to hibernate or migrate.
    2. Affect significantly the local distribution or abundance of otters.
- Possess, transport or sell an otter.

5.1.5 A European Protected Species (EPS) licence can be issued by Natural England for the disturbance of otters in relation to a development. Licences can only be granted if there is no satisfactory alternative or if the action authorised will not be detrimental to the maintenance of the population of the species at a favourable conservation status in their natural range.