

Barnsley West

OUTLINE BIODIVERSITY AND ECOLOGICAL MANAGEMENT PLAN

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Strata Sterling Barnsley West Ltd

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GLOSSARY

ACIEEM	Associate Member of the Chartered Institute of Ecology & Environmental
	Management
BBAP	Barnsley Biodiversity Action Plan
BEMP	Biodiversity and Ecological Management Plan
BSI	British Standards Institution
CIEEM	Chartered Institute of Ecology & Environmental Management
ECoW	Ecological Clerk of Works
GCN	Great Crested Newt
НАР	Habitat Action Plan
LBAP	Local Biodiversity Action Plan
LPA	Local Planning Authority
MCIEEM	Member of Chartered Institute of Ecology & Environmental Management
NPPF	National Planning Policy Framework
SAP	Species Action Plan



1.0 INTRODUCTION

1.1 BACKGROUND

Tetra Tech was commissioned by Strata Sterling Barnsley West in March 2021 to prepare an Outline Biodiversity and Ecological Management Plan (BEMP) for the site known as 'Barnsley West'.

This report has been prepared by Monica Souza BSc (Hons) MSc ACIEEM and the conditions pertinent to it are provided in Appendix A.

For the purposes of this document, please note that WYG rebranded to Tetra Tech in January 2021.

1.2 SITE LOCATION

The site is located 2 km west of Barnsley town centre, on land between the communities of Gawber, Higham, Pogmoor, Redbrook and Barugh Green and immediately north-east of Junction 37 of the M1 motorway (Figure 1). The site comprises of approximately 116 hectares of open fields, which were previously open-cast mine and later refilled.

Currently, the site is generally comprised of open pastoral and arable fields, with associated boundary hedgerows, trees and ditches, and areas of semi-natural woodland.

1.3 DEVELOPMENT PROPOSALS

A hybrid planning application will be submitted, with proposed development comprises a mixed-use development to provide up to 1,760 new homes and up to 43 hectares of employment land. In addition, the proposals will provide: part of the Link Road between M1, Junction 37 and the A635, Barugh Green Road; A new primary school; Small local shops and community facilities and areas of greenspace. Remodelling of the site (via a 'cut and fill') will also be required at the outset, to enable the formation of development platforms.

The hybrid application will be split into two areas' a 'Detailed Phase 1 Residential Area' and the 'Outline Application Area' (Figure 2). The Detailed Phase 1 Residential Areas includes details of proposed residential units, associated infrastructure and detailed landscape proposals. The Outline Application Area comprise principles of development, allowing for residential units, industrial units, associated infrastructure and illustrative landscaping proposals.

1.4 ECOLOGICAL BACKGROUND

A number of previous ecology surveys have been carried on site which have been used to inform this BEMP:

- Wildscapes. (2013a). Land South of Barugh Green Road UB4A.
- Wildscapes. (2013b). Land South of Barugh Green Road UB4B.
- Wildscapes. (2014). Land at Higham UB2A.
- AECOM. (2017). Barnsley West: Preliminary Ecological Appraisal.
- WYG. (2018a). Barnsley West: Great Crested Newt eDNA Survey Report.
- WYG. (2018b). Barnsley West: Bat Survey Report.
- WYG. (2019a). Barnsley West: Badger and Hedgerow Survey Report.
- WYG. (2019b). Barnsley West: Breeding Bird Survey Report.
- WYG. (2020a). Barnsley West: Factual Badger and Hedgerow Survey Report.
- WYG. (2020b). Barnsley West: Factual Great Crested Newt eDNA Survey Report.
- WYG. (2020c). Barnsley West: Factual Bat Survey Report.
- WYG. (2020d). Barnsley West: Factual Breeding Bird Survey Report.
- WYG. (2021). Barnsley West: Factual Ecological Appraisal.



• Tetra Tech. (2021) Barnsley West: Hedgerow Regulations 1997 Survey and Hedgerow Assessment

A summary of the most recent / relevant baseline information for this BEMP is provided below, in Table 1.

Table 1: Survey Results Summary

Survey Type	Summary of Results
Habitats	The site was dominated by improved grassland and arable fields,
	with associated boundary hedgerows, trees and ditches.
	Areas of broad-leaved semi-natural woodland and semi-improved grassland
	were also present, along with smaller areas of dense scrub, tall
	ruderal, amenity grassland and bare ground (WYG, 2021).
	Twelve 'Important' hedgerows were identified on site (WYG, 2020a; Tetra
	Tech, 2021).
Bat	No bats roosts were recorded on site. One bat roost was recorded off site
	within, Redbrook Farm farmhouse.
	Bats activity was often recoded on site near woodland and hedgerows
	partuclarly: along the double hedgerow along Hermit Lane; along the smaller
	interconnected hedgerows located in the north and south of site; and, around
	the improved and arable fields in the south-east of site (WYG, 2020c).
Birds	The site was considered to support a bird assemblage largely
	associated with farmland habitats, though also noting a number of
	garden bird species, which was likely influenced by the adjacent
	residential areas (WYG, 2020d).
Hedgehog	A single hedgehog was recorded on site in 2020 and suitable
	habitat is present for hedgehog (WYG, 2021).
Invertebrates	The site was considered likely to support common invertebrates but
	was considered unlikely to support notable populations of notable
	species (WYG, 2021).
Great Crested	GCN, reptiles, badger, otter and water vole were considered likely to be
Newt (GCN),	absent from the site (WYG, 2021; 2020a; 2020b).
Reptiles,	
Badger, Otter	
and Water Vole	

1.5 PURPOSE OF THE DOCUMENT

The purpose of this document is to provide the following:

- A description of habitats to be retained and created (including proposed illustrative habitats) on site;
- General principles of management techniques for retained and created / proposed illustrative habitats; and
- A general management schedule for the first five years of operation.

Note that scientific names are provided at the first mention of each species and common names (where appropriate) are then used throughout the rest of the report for ease of reading.



1.6 LIMITATIONS

The information provided herein does not comprise detailed designs, specifications or landscaping strategies (e.g. establishment techniques). It is assumed that subsequent detailed designs, specifications and / or strategies will be produced and provided to contractors with associated information and monitoring regimes.

Given the illustrative nature of much of the landscape design provided to date, it is recommended that this document is review and update, as necessary, once further landscape details are provided for the scheme (either across the site or a plot-by-plot basis).



2.0 RELEVANT PLANNING POLICY AND LEGISLATION

2.1 REVISED NATIONAL PLANNING POLICY FRAMEWORK

A revised National Planning Policy Framework (NPPF) was issued on 19th February 2019 (Ministry of Housing Communities and Local Government, 2019) and currently supplements government Circular *06/2005, Biodiversity and Geological Conservation: Statutory Obligations and their Impact within the Planning System* (Office of the Deputy Prime Minister, 2005).

Circular 06/2005 states that the presence of protected species is a material consideration in the planning process. Paragraph 170 of the NPPF also states that:

Planning policies and decisions should contribute to and enhance the natural environment by:

- a) protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan)
- b) recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland
- c) maintaining the character of the undeveloped coast, while improving public access to it where appropriate
- d) minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures
- e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and
- f) remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate.

Paragraph 175 then goes on to confirm that:

When determining planning applications, local planning authorities should apply the following principles:

- a) if significant harm to biodiversity 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;
- b) development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact 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;
- c) development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists; and

 d) development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to incorporate biodiversity improvements in and around developments should be encouraged, especially where this can secure measurable net gains for biodiversity.

TETRA TECH

Regarding EcIA's and HRA's – any sites identified, or required, as compensatory measures for adverse effects on any Natura 2000/habitats site should also be given the same level as protection as the pSPA's and cSAC's themselves. In addition, when an application is being determined, Paragraph 177 clarifies that:

"The presumption in favour of sustainable development does not apply where the plan or project is likely to have a significant effect on a habitats site (either alone or in combination with other plans or projects), unless an appropriate assessment has concluded that the plan or project will not adversely affect the integrity of the habitats site."

Paragraph 180 is also relevant as;

Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:...

c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.

2.2 LOCAL BIODIVERSITY ACTION PLAN

Local Biodiversity Action Plans (LBAPs) identify habitat and species conservation priorities at a local level (typically County by County) and are usually drawn up by a consortium of local Government organisations and conservation charities. Although they are no-longer managed at a national level many are still reviewed and updated at a local level.

The Barnsley Biodiversity Action Plan (BBAP) (Barnsley Biodiversity Trust, 2009) is the relevant document for this site and it contains the following Habitat Species Action Plans (HAPs) & Species Action Plans (SAPs):

Species Action Plans	
Hedgehog Erinaceus europaeus	Skylark Alauda arvensis
Bats	Tree sparrow Passer montanus
Water Vole Arvicola amphibius	Twite Linaria flavirostris
Ottor Lutro lutro	Creat graated pour Triturus printatus
Otter Lutra lutra	Great crested newt Thturus cristatus
Grey Partridge Perdix perdix	Salmon Salmo salar
Bittern Botaurus stellaris	Bullhead Cottus gobio
Kestrel Falco tinnunculus	White-clawed crayfish Austropotamobius
	pallipes
Little ringed plover Charadrius dubius	Glow worm Lampyris noctiluca
Lapwing Vanellus vanellus	Dingy skipper Ervnnis tages
	3,
Barn owl Tyto alba	Bluebell Hyacinthoides non-scripta

Table 2 LBAP SAPs



Table 3 LBAP HAPs

Habitats Action Plans	
Upland Oakwood	Lowland Heathland
Lowland Mixed Deciduous Woodland	Upland Heathland
Wet Woodland	Blanket Bog
Wood Pasture and Parkland	Purple Moor Grass and Rush Pasture
Hedgerows	Reedbeds
Arable Field Margins	Ponds
Floodplain Grazing Marsh	Rivers
Lowland Meadows	Open Mosaic Habitats on Previously Developed
Lowland Dry Acidic Grassland	Lanu

It should be noted that the existence of a SAP or HAP does not always infer an elevated level importance for those features. These plans may be designed to encourage an increase in these habitats/species, rather than to protect a county-scarce feature (for example).

2.3 LOCAL PLAN

The Barnsley Local Plan (Barnsley Metropolitan Brough Council, 2019) was formally adopted on 3rd January 2019 and sets out the key elements of Barnsley's planning framework up to the year 2033. The relevant policies from the Local Plan are detailed below:

Policy BIO1 Biodiversity and Geodiversity

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 via Section 41 of the Natural Environment & Rural Communities Act 2006 (for list of the species and habitats of principal importance) and in the Barnsley Biodiversity Action Plan.
- Maximising biodiversity and geodiversity opportunities in and around new developments.
- Conserving and enhancing the form, local character and distinctiveness of the boroughs natural assets such as the river corridors of the Don, the Dearne and Dove as natural floodplains and important strategic wildlife corridors.
- Proposals will be expected to have followed the national mitigation hierarchy (avoid, mitigate, compensate) which is used to evaluate the impacts of a development on biodiversity interest.
- Protecting ancient and veteran trees where identified.
- Encouraging provision of biodiversity enhancements.

Development which may harm a biodiversity or geological feature or habitat, including ancient woodland and aged or veteran trees found outside ancient woodland, will not be permitted unless effective mitigation and/or compensatory measures can be ensured.

Development which adversely effects a European Site will not be permitted unless there is no alternative option and there are imperative reasons of overriding public interest (IROPI).



Local Plan Objective 5 is also relevant and is to "achieve net gains in biodiversity". The Indicator / Target for this object is referenced as the "number of Local Wildlife Sites and Rigs sites in positive conservation management" and the Aim of this objective is "to conserve and enhance the Borough's biodiversity and geological features".

Site MU1 Land south of Barugh Green Road

The site is proposed for mixed use predominantly for housing and employment. The indicative number of dwellings proposed on this site is 1700. These are included in the housing numbers for Urban Barnsley in the housing chapter.

43 ha of employment land is proposed on the site and is included in the employment land figures in the Urban Barnsley section of the Economy chapter.

The development will be subject to the production and approval of a Masterplan Framework covering the entire site which seeks to ensure that the employment land is developed within the plan period, that community facilities come forward before completion of the housing and that development is brought forward in a comprehensive manner.

The development will be expected to:

- Provide a primary school on the site;
- Ensure that ground stability and contamination investigations are undertaken prior to development commencing and necessary remedial works completed in accordance with the phasing plan;
- Provide on and off site highway infrastructure works, including a link road (Claycliffe Link) and improvements at Junction 37 as necessary;
- Provide small scale convenience retail and community facilities in compliance with Local Plan policy TC5 Small Local Shops;
- Retain, buffer and manage the watercourse, grassland and woodland north-east of Hermit Lane;
- Retain, buffer and manage the species-rich hedgerows and boundary features. Where this is not possible transplant hedgerows including root balls and associated soils. A method statement for this should be provided and agreed prior to works commencing;
- Create/retain wildlife corridors through/across the site;
- Provide accessible public open space;
- Ensure that any sustainable drainage system incorporating above-ground habitats is designed from the outset to serve the whole site;
- Give consideration to the drain/culvert that runs through the site; and
- Include measures for the protection and retention of the listed milepost on Barugh Green Road 500 m west of the junction with Claycliffe Road and its immediate setting; and
- Protect the routes of the Public Rights of Way that cross the site, and make provision for these as part of any proposal.

Archaeological remains may be present on this site therefore proposals must be accompanied by an appropriate archaeological assessment (including a field evaluation if necessary) that must include the following:

- Information identifying the likely location and extent of the remains, and the nature of the remains;
- An assessment of the significance of the remains; and
- Consideration of how the remains would be affected by the proposed development.



2.4 LEGISLATION

2.4.1 Hedgerow Legislation

The *Hedgerows Regulations (1997)* were made under Section 97 of the *Environment Act (1995)* and came into force in 1997. They introduced new arrangements for local planning authorities in England and Wales to protect 'Important' hedgerows in the countryside by controlling their removal through a system of notification. Important hedgerows are defined by complex assessment criteria, which draw on biodiversity features, historical context and the landscape value of the hedgerow.

It is up to the local planning authority to decide whether circumstances justify the removal of an "Important" hedgerow. However, there is a strong presumption that Important hedgerows will be protected.

Hedgerows are included as a 'habitat of principal importance for the conservation of biodiversity in England' under Section 41 of the Natural Environment and Rural Communities Act (2006) and as a priority habitat within the BBAP. As such they are material considerations for the purposes of planning applications. Some species and their habitats are also afforded protection under national and international statutes and they can use hedgerows as a habitat resource (most notably breeding birds).

2.4.2 Bats

All British bat species are given special protection within England by their inclusion on Schedule 2 of the Conservation of Habitats and Species Regulations 2017 (as amended) and Schedule 5 of the Wildlife and Countryside Act 1981 (as amended).

As a result, it is an offence to:

- Deliberately capture, injure or kill a bat;
- Intentionally or recklessly disturb a bat in its roost or deliberately disturb a group of bats;
- Damage or destroy a bat's roosting place (even if bats are not occupying a roost at the time);
- Possess or advertise, sell or exchange a bat (dead or alive) or any part of a bat; and
- Intentionally or recklessly obstruct access to a bat roost.

Bats are also afforded additional protection under Section 41 of the NERC Act 2006.

This plan seeks to minimise impacts upon foraging and commuting bats and provide enhancements for both roosting and foraging / commuting bats.

2.4.3 Breeding Birds

All wild birds in the UK are protected under Section 1 of the Wildlife and Countryside Act 1981 (as amended) which makes it an offence to intentionally kill, injure or take any wild bird or take, damage or destroy the nest (whilst being built or in use) or its eggs. Bird species listed in Schedule 1 of the 1981 Act (as amended) receive further protection which makes it an offence to intentionally or recklessly disturb these species while building a nest or in, on or near a nest containing eggs or young; or to disturb dependent young of such a bird.

Some bird species are also afforded additional protection under Section 41 of the NERC Act 2006.

This plan seeks to minimise impacts upon breeding birds and provide enhancements for both breeding and foraging birds.

2.4.4 Hedgehogs

West European hedgehogs are protected in British law under Schedule 6 of the Wildlife and Countryside Act 1981 (as amended), making it illegal to kill or capture wild hedgehog using certain



methods. They are also protected in Britain under the Wild Mammals (Protection Act 1996), prohibiting cruelty and mistreatment.

West European hedgehogs are also afforded additional protection under Section 41 of the NERC Act 2006.

This plan seeks to minimise impacts upon and provide enhancements for West European hedgehog.



3.0 HABITATS AND ECOLOGICAL FEATURES

3.1 RETAINED HABITATS

The site is currently dominated by improved grassland, arable fields, with associated boundary hedgerows, trees and ditches. Areas of broad-leaved semi-natural woodland and semi-improved grassland were also present, along with smaller areas of dense scrub, tall ruderal, amenity grassland and bare ground.

Whilst an extensive cut and fill exercise is required across the site, resulting in the loss of the majority of habitats on site, the following habitats will be retained.

3.1.1 Woodland

The woodland located in the east of site, to the north and south of Hermit Lane, will be retained and protected as part the development proposal, within the Strategic Green Space as indicated on the Landscape Masterplan for the site is provided in Appendix B (Drawing Number P11754-00-001-GIL-0100). It should be noted that an area of approx. 0.3 ha (located north of Hermit Lane) will be lost; however, the majority of the woodland will be retained and the Strategic Green Space will replace and extended the green corridor currently formed by the woodland area to be lost.

3.1.2 Hedgerows

Hedgerow were present throughout the site along field boundaries. Due to the extensive cut and fill exercise required, it will not be possible to retain all hedgerows *in situ*. However, species-rich hedgerows, which cannot be retained, will be translocated to the western boundary of the Detailed Phase 1 Residential Area, with a slight extension beyond the Detailed area, into the Outline Application Area (see Appendix B for hedgerow location).

3.2 HABITATS TO BE CREATED

3.2.1 Detailed Phase 1 Area

The Landscape Masterplan for the site is provided in Appendix B and includes for the creation of the following habitats within the Detailed Phase 1 Residential Area.

Swales and Dams

Swales and dams will be created along the main spine road, located to on the eastern boundary of the Phase 1 Area. Species to be planted will include XXXX[SJ2][SJ3].

Street Trees and Landscape Trees

Scattered trees will be planted along the main spine road, along the eastern boundary of the Phase 1 Area; and, throughout open green areas within the Phase 1 Area. Species to be planted will include XXX.

Native Mixed Hedgerow

Two lengths of new native species hedgerow will be planted in the Phase One Area, one in the west and one in the south. Species to be planted will include XXX.

'Traditional' Wildflower Meadow

Traditional wildflower meadows will be created in areas adjacent to the swales, along the main spine road in the east of the Phase 1 Area; and, in smaller areas within green open space in the north and south of the Phase 1 Area. Species to be planted will include XXX.



Amenity Grass mix

Amenity grassland will be planted along the main spine road in the east of the Phase 1 area; and, throughout green areas within the Phase 1 Area. Species to be planted will include XXX.

Native Shrubs Planting Mix

Native shrubs will be planted along the main spine road in the east of the Phase 1 Area and within green open areas in the southern half of the Phase 1 Area. Species to be planted will include $\frac{XXX}{XX}$.

Ornamental Planting

A small area of ornamental planting is proposed in the north of the Phase 1 area, around an apparent substation. Species to be planted will include XXX

3.2.2 Outline Application Area

The Landscape Masterplan for the site is provided in Appendix B and provides illustrative landscaping proposals for the Outline Application Area, which comprise the following habitats.

Swales and dams

Swales and dams are proposed to be created along the eastern side of the main spine road, in the north-west of the Outline Application Area. Suggested species to be planted include XXX.

Allotments

Allotments are proposed to be created in the west of the Outline Application Area, near the proposed new woodland planting in the centre the Area. Further allotments are proposed in the south-east of the Outline Application Area, adjacent to Farm House Lane.

Community Orchards

Fruit bearing tree species are proposed to be planted next to the allotments, with suggested species to be planted include XXX.

Street Trees and Landscape Trees

Trees are proposed to be planted over the amenity grassland throughout the Outline Application Area. Suggested species to be planted include $\frac{XXX}{X}$.

Permanent Body of Water

Permanent bodies of water are proposed to be created within the wet meadow areas along the eastern egde of the Outline Application Area.

Wet Meadow

Wet meadows are proposed to be created within drainage areas along the eastern edge of the Outline Application Area. Two additional areas are proposed along the southern section of the main spine road. Suggested species to be planted include XXX.

'Traditional' Wildflower Meadow

Traditional wildflower meadows are proposed to be created along the main spine road in the west of the Outline Application area and in smaller areas throughout the Outline open green space. Suggested species to be planted include XXX.



Amenity Grass mix

Amenity grassland is proposed to be planted throughout the open green space in the Outline area, near to footpaths, play areas, allotments and along the main spine road. Suggested species to be planted include XXX.

Rocky Gorse / Shrub

Areas of rocky gorse and shrub are proposed to be created in the southern half of the Outline Application Area, either side of the retained woodland / proposed drainage area near the eastern edge of the site. Suggested species to be planted include XXX.

Ornamental Planting Mix

Small areas of ornamental planting are proposed to be created near the northern-most formal play area. Suggested species to be planted include XXX.

Wet Scrub Planting

Wet scrub is proposed to be planted within the wet meadow areas along the eastern edge of the Outline Application Area. Suggested species to be planted include XXX.

Native Shrub Planting Mix

Native shrubs are proposed to be planted in small sections through the open green space in the north and centre of the Outline Application Area, as well as along the main spine road. Suggested species to be planted include XXX.

Woodland planting

Woodland corridors comprised of a mix of deciduous and evergreen species are proposed to planted along the boundaries of the Outline Application Area and on the centre of the Area' dividing the commercial and residential area, and extending retained woodland (north of Hermit Lane) to the west. Suggested species to be planted include XXX.



4.0 PROTECTION, MITIGATION AND MANAGEMENT

Details of the required protection and mitigation measures, as well as general principles for management activities for habitats and ecological features on site are provided below. Both the construction and operational phases of the development are considered.

Please note, a landscape architect should also be consulted to provide detail establishment techniques for each of the proposed habitats.

4.1 CONSTRUCTION PHASE

This section describes the general principles for management activities to be carried out during the construction phase of the development. These activities have been designed to minimise potential negative impacts upon ecological receptors within or adjacent to the site.

It is recommended that all construction workers are provided with a 'Toolbox Talk' prior to commencing work on site, so that they are made aware of the ecological receptors relating to the site. This talk will outline the ecological features on site, their locations and will explain the purpose of this BEMP. It is anticipated that this would be incorporated into the general health and safety induction which is given to all workers when they first visit the site. This BEMP document should be kept available during construction works, ready for reference at any time.

4.1.1 Retained Habitats

Woodland and Translocated Hedgerows

Details regarding hedgerow translocation will be provided within a Hedgerow Translocation Method Statement, once further details regarding the scheduling of the Phase 1 development area known. Any hedgerow plants which die / fail as a result of translocation will be replaced, to prevent gaps forming within the hedgerow.

Retained woodland and retained / translocated hedgerows with be protected by root protection zones, in accordance with *BS 5837: 2012 Trees in relation to design, demolition and construction* (BSI, 2012), under the advice of an arboriculturalist. The outer edges of the protection zones will be marked with barrier fencing to exclude construction works and vehicle movements. If excavations are required in the immediate vicinity of trees, these will be carried out by hand following consultation with an arboriculturalist.

4.1.2 Created Habitats

Trees, Shrubs and Hedgerows

Planting is best undertaken between October and April, to encourage new specimen survival rates. Avoid planting in waterlogged conditions (water sitting on the soil surface or pooled in the bottom of the hole) or in frozen soil.

Plants will not grow where soil contains too little air or where soil moisture is either excessive or insufficient. Pre-planting soil preparation should aim to improve these conditions. Loosen the soil to a depth equivalent to the height of the rootball and over a wide area to eliminate compaction and improve drainage. Improve soil structure on heavy or sandy soils by incorporating organic matter. Insert a stake if required. Small trees do not require staking but top-heavy or larger specimens should be staked. Protect from deer or rabbit damage where necessary by using tree spirals, chicken-wire guards or similar.

Sufficient spacing between woodland trees (as defined by the landscape architect) should also be adhered to.



New deciduous hedges should be planted any time from leaf fall (typically from mid-autumn until late winter). Delay planting if the soil is waterlogged or frozen. Prepare the ground so the soil becomes friable (has a crumbly texture) and is free of other growth. Take care of the roots before planting by keeping them covered at all times, especially when it is sunny or windy. Keep new hedges well-watered for the first two years.

Where possible, hedgerows could be planted in double-staggered rows to increase their width and thus, their ecological value.

Where necessary, planted trees, shrubs and hedgerows will be provided some form of support or protection (i.e. tubes / stakes). In addition, protection zones should be created around newly planted trees, shrub and hedges, in line with the *BS 5837: 2012 Trees in relation to design, demolition and construction* (BSI, 2012).

Wildflower Meadow, Wet Meadow / Swales and Amenity Grassland

Seed is best sown in the autumn or spring but can be sown at other times of the year if there is sufficient warmth and moisture. The seed must be surface sown and can be applied by machine or broadcast by hand. To get an even distribution and avoid running out, divide the seed into two or more parts and sow in overlapping sections. Do not incorporate or cover the seed but firm in with a roll, or by treading, to give good soil/seed contact.

Permanent Body of Water

Permanent bodies of water created on site should be allowed to naturally fill and it is advised that aquatic vegetation should also be allowed to naturally colonise these waterbodies.

4.2 OPERATIONAL PHASE

This section provides general principles of the proposed management of the retained / created habitats for the first five years of operation. The management proposals below focus on promoting ecological gains and detailed habitat management techniques, to ensure habitats remain in good condition, should be provided by a suitably qualified landscape architect.

Where additional issues are identified that are not currently covered in this management plan, or where it is considered that revised maintenance regimes are needed to maximise the ecological value of the site, recommendations for changes to management prescriptions will be made as appropriate.

4.2.1 Woodland

Dead Wood and Old Trees

Dead wood and dying trees provide suitable habitat for bats, birds, invertebrates, fungi, lichens and mosses. As such, any fallen branches / trees should be left *in situ* and old or dead trees should be left to decay naturally where possible and safe to do so. Where dead wood needs to be moved, 'habitat piles' should be created elsewhere within the woodland area.

Habitat piles comprise cut and / or dead wood stacked in a shady area of the woodland, which are then left to rot away. The habitat piles will enhance the site for invertebrates and provide suitable habitat for hibernating hedgehog.



Illustration 1: Example of a habitat pile.



Thinning

Thinning can be beneficial in areas where trees are growing closely together so that little light gets to the woodland floor. Thinning removes the less healthy or less desirable trees and gives the remaining trees more space to develop. It also allows light to the woodland floor, encouraging an 'understorey' of small plants, shrubs and trees to grow.

Selective thinning should aim to favour native trees such as oak, and promote the establishment of understorey species including hazel, holly and hawthorn.

Thinning should be carried out at regular intervals, for example every 10 or 15 years for areas of broad-leaved trees. Thinning should be undertaken following the advice of a suitably experienced landscape architect or forestry contractor. Thinning should be undertaken outside of the nesting bird season (i.e. avoid March – September, inclusive, in any given year), to avoid possibly breaching legislation which protects breeding birds and their nests / eggs.

4.2.2 Tree and Shrub Management

Trees and shrubs are relatively maintenance free, but care should be taken to ensure that they establish successfully, and occasional trimming of shrubs may be required. For best practice trimming and pruning should be undertaken between November and February (inclusive) to avoid nesting birds. Trees and shrubs must not be removed or severely thinned / trimmed during the bird nesting season (March to September, inclusive) without being checked by a qualified ecologist to avoid possibly breaching legislation which protects breeding birds and their nests / eggs.

4.2.3 Hedgerow Management

Retained / translocated hedgerows will be allowed to grow up to at least 1.5 m high and should also be encouraged to grow wide, as well as tall. Retained / translocated and new hedgerows (once established) should be trimmed on one side annually to allow flowering and provide food for birds, with the cut side alternating each year. Trimming should be undertaken from between November and February (inclusive) to avoid nesting birds and allow hedge species to flower, produce berries and provide food for birds into the autumn/winter.

4.2.4 Wildflower Meadow and Wet Meadow / Swale

First year of Management

Most sown meadow wildflower and grass species are perennial; they will be slow to germinate and grow and will not usually flower in their first growing season. There will often be a flush of annual



weeds from the soil in the first growing season which may grow up and obscure the meadow seedlings beneath. This annual weed growth is easily controlled by topping or mowing.

Mow newly sown meadows regularly throughout the first year of establishment to a height of 40-60mm, removing cuttings if dense. This will control annual weeds and help maintain balance between faster growing grasses and slower developing wild flowers.

Annuals should be allowed to flower, then in mid-summer cut back and the cut vegetation removed. It is important to cut back cornfield annuals before they die back, set seed or collapse: this cut will reveal the developing meadow mixture and give it the space it needs to develop.

Carefully dig out or spot treat any residual perennial weeds such as docks.

Management Once Established

Zoned management of wildflower margins frequently produces the best diversity of habitat structure: areas closest to the scrub or woodland boundary and those which are more shaded are left uncut in most years. Areas that are further from the margin and more open can be managed as grassland habitat. For example, in a 6 metre sown margin the 2-3 metres against the boundary could be left uncut, the next 3-4 metres cut once a year.

For wildlife, this cutting is best done on a rotational basis so that no more than half the area is cut in any one year leaving part of the grassland as an undisturbed refuge. To benefit invertebrates, the areas which are mowed only once a year should be mowed between the end of July or start of August.

Vegetation that is not mown or grazed each year will become rough and "tussocky" in character. It can form useful refuge habitat on corners and margins of a site. However, if not managed it can tussocky grassland can start to become dominated by scrub. To control scrub and bramble development these tussocky areas may need cutting every 2-3 years between October and February (inclusive).

4.2.5 Amenity Grassland

During the first year of establishment, amenity grass verges should be mown regularly to a height of 40-60mm to control annual weeds, removing arisings if dense. Larger weeds can be spot treated or dug out by hand, if required.

Once established, cutting in spring and early summer should be avoided, where possible, to allow annuals to flower. In mid-summer (e.g. July / August), the meadow can then be mown (to approx. 100mm), with arisings left *in situ* for 24 - 48 hours (allowing seed to set), before being removed. Providing that continuity of mowing is maintained over the years, then those wildflowers able to flower and set seed between cuts will be encouraged.

For areas within highway visual splays and along the main spine road the mowing regime may need to be more intensive for amenity reasons and in these areas some of the wildflower diversity will likely be lost.

4.2.6 Waterbody Management

Outside of the amphibian / bird breeding season (i.e. October – February, inclusive) a number of management tasks should be completed in order to maintain the suitability of the waterbodies to amphibians and breeding waterfowl. These measures will include:

- Ensuring a minimum of 25% open water in each waterbodies, to prevent waterbodies becoming choked with vegetation and losing suitable areas for amphibian breeding displays;
- Management of trees and shrubs adjacent to waterbodies, to prevent complete over shading;
- Where necessary, waterbodies will be desilted to maintain an appropriate water level;



- Routine checks for presence of fish and non-native invasive species, and appropriate removal of any identified;
- Checks for and removal of any litter within waterbodies; and
- General checks of the condition of each waterbodies and delivery of any required remedial works to repair any damage / improve the nature of the waterbodies.



5.0 SUMMARY OF MANAGEMENT ACTIONS

Table 4 details the anticipated timetable for delivery / completion of management tasks. Each task is presented along with the recommended delivery month / season. The years in which each task will be undertaken is denoted by green shading.

Table 4. Summary of Management Actions

Task	Recommended Month / Season	Yr 0	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5
Pre-construction							
Provide Ecological Toolbox Talk to all contractors	On induction to site						
Protect trees and hedgerows in accordance with BS 5837:2012 Trees in Relation to Design, Demolition and Construction.	Prior to commencement of works.						
Undertake hedgerow translocation and protection in accordance with BS 5837:2012 Trees in Relation to Design, Demolition and Construction.	Prior to commencement of works.						
Undertake vegetation clearance (checking vegetation for hedgehog)	November to February (outside of nesting bird season). If this is not possible. a breeding bird check is also required.						
	Avoid dismantling any suitable hedgehog hibernacula until spring.						
During Construction							
Provide Ecological Toolbox Talk to all contractors	On induction to site						
Habitat creation, including installation tubes / stakes for trees and watering regime	As per landscape architect recommendations.						
Protection of any planted trees / shrubs / hedgerows in accordance with BS 5837:2012 Trees in Relation to Design, Demolition and Construction.	Protection fencing installed once each tree / shrub / hedge is planted.						



Task	Recommended Month / Season	Yr 0	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5
Protection of newly created grasslands	Protection fencing installed once each grassland area created.						
Nesting bird checks by an ecologist	If vegetation clearance required between March and September (inclusive).						
General good practice measures – e.g. covering of excavations, correct storage of hazardous materials	At all times.						
Post-construction							
Removal of grass and weeds within 1 m diameter around newly planted shrubs / trees	Spring / Late Summer as necessary						
Cutting of Meadows	Frequent cutting during establishment as informed by monitoring. Following this, a single cut in July/August or areas left over winter.						
Trimming / pruning of trees and shrubs	As necessary. Pruning of trees should take place October – February (outside of the nesting bird season).						
Cutting of hedgerows	Cutting should take place annually outside of the nesting bird season, cut alternative sides of the hedgerow each year.						
Woodland Management	monitoring of litter and antisocial behaviour, and a review of any requirements for tree management or thinning.						



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Please note that the legislation which is relevant to this report is not included in the list above, but details are included in Appendix B below.



FIGURES

Figure 1 – Site Location Plan

Figure 2 – Site Plan



APPENDIX A – REPORT CONDITIONS

This Report has been prepared using reasonable skill and care for the sole benefit of [Strata Sterling Barnsley West Ltd] ("the Client") for the proposed uses stated in the report by [Tetra Tech Environment Planning Transport Limited] ("Tetra Tech"). Tetra Tech exclude all liability for any other uses and to any other party. The report must not be relied on or reproduced in whole or in part by any other party without the copyright holder's permission.

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The report refers, within the limitations stated, to the environment of the site in the context of the surrounding area at the time of the inspections'. Environmental conditions can vary and no warranty is given as to the possibility of changes in the environment of the site and surrounding area at differing times. No investigative method can eliminate the possibility of obtaining partially imprecise, incomplete or not fully representative information. Any monitoring or survey work undertaken as part of the commission will have been subject to limitations, including for example timescale, seasonal and weather-related conditions. Actual environmental conditions are typically more complex and variable than the investigative, predictive and modelling approaches indicate in practice, and the output of such approaches cannot be relied upon as a comprehensive or accurate indicator of future conditions. The "shelf life" of the Report will be determined by a number of factors including; its original purpose, the Client's instructions, passage of time, advances in technology and techniques, changes in legislation etc. and therefore may require future re-assessment.

The whole of the report must be read as other sections of the report may contain information which puts into context the findings in any executive summary.

The performance of environmental protection measures and of buildings and other structures in relation to acoustics, vibration, noise mitigation and other environmental issues is influenced to a large extent by the degree to which the relevant environmental considerations are incorporated into the final design and specifications and the quality of workmanship and compliance with the specifications on site during construction. Tetra Tech accept no liability for issues with performance arising from such factors.



APPENDIX B – LANDSCAPE PLAN (DRAWING NUMBER P11754-00-001-GIL-0100)







Site Plan Barnsley West

Strata Sterling Barnsley West Ltd

Legend

Detailed Phase 1 Residential Area

Outline Application Area

Notes:

Drawn by: CL

Checked by: MA

Office: Southampton

Figure No. 2 Revision No. A

120 240

Scale 1:8,000 @A3

360 Meters

03 June 2021 NGR: 431844E 407077N

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