ENVIRONMENTAL STATEMENT VOLUME 3: APPENDICES

Land to the North and South of Dearne Valley Parkway Gateway 36 Phases 2 & 3

Harworth Group

Job No: 191DH600

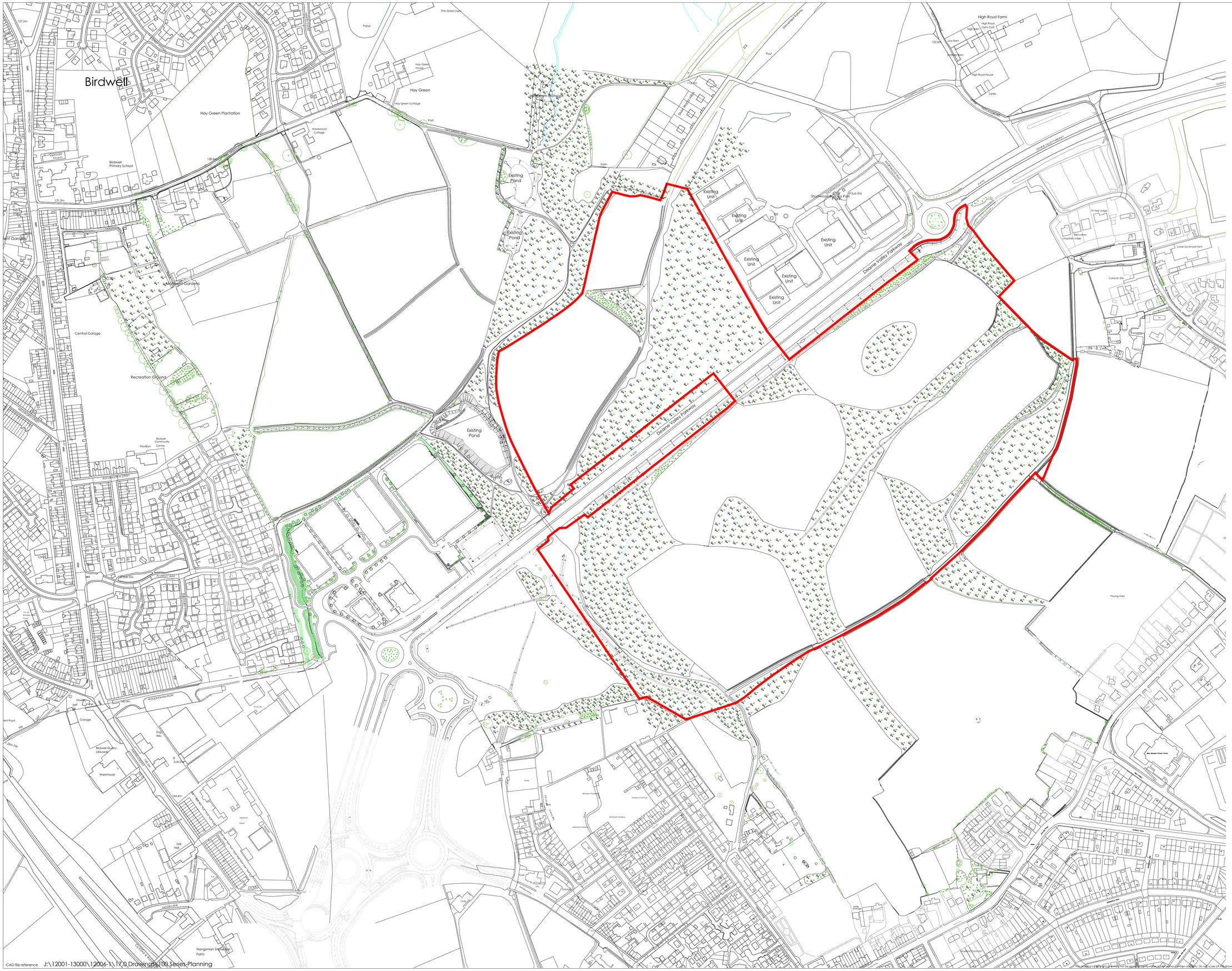
January 2020

CUSHMAN & WAKEFIELD

CONTENTS

1.	Site Location Plan	3
2.	Illustrative Masterplan	4
3.	Screening Letter	5
4.	Screening Opinion	6
5.	Scoping Report	7
6.	Scoping Opinion	8
7.	Parameters Plan	9
8.	Presentation Boards	10
9.	Air Quality Assessment	11
10.	Ecology Appendices	12
11.	Landscape and Environmental Management Plan	13
12.	Landscape Appendices	14
13.	Ecology and Associated Loss of Habitat	15

1. Site Location Plan


Birdwell
Hay Green Plantation
Birdwell Primary School
Hay Green
Hawkwood Cottage
Hay Green House
Hay Green Cottage
Existing Pond
Existing Pond
Existing Pond
Existing Pond
Path
Post
Central Garage
Recreation Ground
Birdwell Community Centre
Pavilion
Shelter
Allotment Gardens
Existing Unit
Existing Unit
Existing Unit
Existing Unit
Existing Unit
Existing Unit
Shadowmoss Road Park
Sub Sta
Dearne Valley Parkway
High Royd Farm
High Royd Farm Cott
High Barn
Low Barn
Middle Barn
High Royd House
Sanks
Fir Tree Lodge
Rencorlees
Longsad Lodge
Lower Sycamore Farm
Caravan Site
Playing Field
Birdwell Quarry (Disused)
Warehouse
Garage
Drill Hall
Hangman Stones Farm
Allotment Gardens
Houses and Gardens
Hotels
Shops
Offices
Industrial Units
Warehouse
Sub Sta
Pond
Post
Path
Footbridge
Bridge
Cutting
Embankment
Tunnel
Weir
Sewage Works
Pumping Station
Cemetery
Cricket Pitch
Tennis Courts
Bowling Green
Playing Field
Sports Ground
Golf Course
Golf Course
Golf Course

2. Illustrative Masterplan

NORTH
Birdwell
Hay Green Plantation
Birdwell Primary School
Central Garage
Recreation Ground
Birdwell Community Centre
Hay Green
High Royd Farm
High Royd House
Existing Pond
Pond
GATEWAY 36
PHASE 3
GATEWAY 36
PHASE 2A
GATEWAY 36
PHASE 2B
Office
Service Yard
Car Park
Bus Park
Access Road
Dearne Valley Parkway
Existing Unit
Proposed Access
Existing Footpath to be retained
Future link to Hoyland Masterplan (By Others)
Hangman Stone Farm
Warehouse
Garage
Birdwell Quarry (Disused)
Drill Hall
Rockingham Road
Birdwell Road
Aunsley Way
Doncaster Road
Rockingham Street
Dearne Valley Parkway
Hoyland Road
Sheffield Road
Wakefield Road
Barnsley Road
Pontefract Road
Doncaster Road
Rockingham Road
Rockingham Street
Aunsley Way
Birdwell Road

3. Screening Letter

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Your Ref
Our Ref

29th October 2019

Dear Mr. Jenkinson,

The Town and Country Planning (Environmental Impact Assessment) Regulations 2017
Request for Screening Opinion
Proposed development at land North and South of Dearne Valley Parkway – Gateway 36 Phases 3 and 2 (Local Plan site references: ES15 and ES17).

Cushman & Wakefield is instructed by Harworth Group to prepare a hybrid planning application for use classes B1, B2 and B8 development (79,153.4sqm) at Dearne Valley Parkway, Barnsley. The application sites are identified in the adopted Barnsley Local Plan as sites ES15 (north of Dearne Valley Parkway – known as Gateway 36 Phase 3) and ES17 (south of Dearne Valley Parkway – known as Gateway 36 Phase 2). The proposed development falls within Schedule 2 of the EIA Regulations 2017 (Schedule 2, 10 (a) Industrial Estate Type Projects).

Site ES17 is within the Hoyland North Masterplan area, whilst ES15 is outside of this area. Following discussions with Barnsley Metropolitan Borough Council and legal advice from Gateley it has been agreed that this screening opinion will include the other sites within the Hoyland North Masterplan i.e. sites: HS64, HS56, HS66 (allocated for residential development in the adopted Barnsley Local Plan) and ES14 (allocated for employment use in the adopted Barnsley Local Plan) as part of a wider cumulative assessment[1].

This is a formal request for a screening opinion from the Local Planning Authority (LPA) under Part 2 (Paragraph 6) of Town and Country Planning (Environmental Impact Assessment) (EIA) Regulations 2017 to determine whether the proposed development is EIA development (Schedule 2).

Part 2, Paragraph 6 of the EIA Regulations 2017 identifies the information required to be submitted as part of a screening request. This is detailed below:

(a) a plan sufficient to identify the land;

(b) a description of the development, including in particular—

(i) a description of the physical characteristics of the development and, where relevant, of demolition works;

(ii) a description of the location of the development, with particular regard to the environmental sensitivity of geographical areas likely to be affected;

(c) a description of the aspects of the environment likely to be significantly affected by the development;

1 In accordance with Schedule 3 1(b) of the EIA Regulations 2017(p71).

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(d) to the extent the information is available, a description of any likely significant effects of the proposed development on the environment resulting from—

(i) the expected residues and emissions and the production of waste, where relevant; and

(ii) the use of natural resources, in particular soil, land, water and biodiversity; and

(e) such other information or representations as the person making the request may wish to provide or make, including any features of the proposed development or any measures envisaged to avoid or prevent what might otherwise have been significant adverse effects on the environment.

Accordingly, this letter is structured as follows:

a) Identification of Land;

b) Description of development (incorporating (i) and (ii);

c) Aspects of the environment likely to be significantly affected by the development;

d) Any likely significant effects of the proposed development on the environment incorporating (i) and (ii);

e) Features of the proposed development or any measures envisaged to avoid or prevent what might otherwise have been significant adverse effects on the environment;

a) Identification of Land

The land proposed for development is shown on the Site Location Plan (ref: 12006-1-001 rev C). The Hoyland North Masterplan sites to be considered cumulatively are shown the plan at Appendix 1. A schedule of the sites is included below:

Sites	Site area (hectares)	Proposed use
Application Sites		
ES15 (North of Dearne Valley Parkway)	14.4	Use classes B1, B2 and B8.
ES17 (South of Dearne Valley Parkway)	28	Use classes B1, B2 and B8.
Total	**42.4ha**	(total floorspace quantum 79,153.4sqm)
Cumulative Sites		
ES14	8.71	Employment (use class B1, B2 and B8). A café (Starbucks) has been granted planning permission at part of this site[2].
HS64	19.25	615 dwellings (of which, 100 units have outline planning permission[3]).
HS56	6.39	80 dwellings
HS66	2.6	70 dwellings
Total Cumulative Sites	**36.95**	765 dwellings
Overall Total	**79.35ha**	

Table 1: Schedule of sites[4].

2 Planning ref: 2018/0745
3 Planning ref: 2016/1531
4 The areas for the Hoyland North Masterplan sites in hectares are those identified in the respective Barnsley Local Plan policies

b) Description of Development

i) Physical Characteristics

It is proposed to submit a planning application in hybrid format for sites ES15 and ES17, seeking outline approval for the development with full approval of works to create access points (including a new roundabout) and earthworks to create development platforms for the proposed development.

The Hoyland North Masterplan sites are undeveloped and with the exception of part of sites HS64 and ES14 do not have planning permission. This screening assessment is therefore based on the quantum of development identified for each site within the adopted Barnsley Local Plan and as detailed in the draft Hoyland North Masterplan Framework (2019[5]).

In accordance with the criteria identified at Schedule 3 Paragraph 1 of the EIA Regulations 2017, the physical characteristics of the proposed development are described as follows, split between those elements for which outline and full permission is sought and the Hoyland North Masterplan sites.

Outline Planning Permission

Outline planning permission – approval of layout and scale, (appearance and landscaping reserved).

- No demolition proposed.
- Construction of units to create up to 79,153.4sqm floorspace for business, industrial and storage use (use classes B1,B2 and B8).
- Construction of sustainable drainage system comprising attenuation pond(s) and associated pipes and swales.
- Construction of drainage pumping station.
- Creation of landscaped areas (including replacement planting).

Full Planning Permission

- Removal of vegetation (mostly trees within site ES17). Replacement landscaping/habitats to be created as part of biodiversity offsetting measures. Replacement likely to be able to be accommodated on site (but if this is not possible – could be accommodated off site – on an alternative site in the vicinity (within the ownership of Harworth Group).
- Earthworks (cut and fill) to create development platforms on sites ES15 and ES17. All material to be retained on site.
- Construction of new roundabout and access routes to sites ES15 and ES17.

Cumulative Sites

The Hoyland North Masterplan sites (identified at Table 1 page 2) will be considered cumulatively with the application site.

5 It is understood that the Hoyland North Masterplan Framework is likely to be adopted by Barnsley Council in December 2019.

ii) Location and Environmental Sensitivity

In accordance with the criteria identified at Schedule 3 Paragraph 2 of the EIA Regulations 2017, the location of the development (and cumulative sites) and the environmental sensitivity of their geography have been considered and are summarised below, split between the application sites and the cumulative sites.

Application sites

- Sites ES15 and ES17 are allocated for employment uses within Barnsley Local Plan (Policies E1 and E2).
- Site ES17 is within the Hoyland North Masterplan area whilst ES15 is outside this area.
- Greenfield in nature – previously the subject of coal mining and tipping activity before being restored. Public access via public rights of way (to be diverted as part of development proposals).
- Presence of hedgerows, trees and woodland. No Tree Preservation Orders (TPO's) or ancient woodland within or adjacent to the site.
- Site ES15 slopes down from the Dearne Valley Parkway. Site ES17 slopes steeply upwards from the Dearne Valley Parkway.
- Existence of ponds within ES17.
- Sites both adjacent to the Dearne Valley Parkway. Both sites to be accessed from this road.
- To the north of site ES15 is land identified as safeguarded land in the Barnsley Local Plan. To the south is the Dearne Valley Parkway with site ES17 beyond this. To the west is an existing employment use development (Gateway 36 phase 1) also developed by the Harworth Group. To the east is the Shortwood Business Park (warehouse/industrial units).
- To the north of site ES17 is the Dearne Valley Parkway with site ES14 beyond. To the south, east and west are the wider Hoyland North Masterplan sites (see below).

Geographic information about the natural environment at and around the site has been accessed using baseline data and surveys (currently being prepared to accompany the forthcoming application), which has indicated the following key points:

- There are no RAMSAR Sites[6], Sites of Special Scientific Interest (SSSI), Special Areas of Conservation or Special Protection areas in the vicinity of the application sites.
- The sites are within Flood Zone 1 and is therefore at low risk of flooding, albeit there are ponds and watercourses running across the sites.
- The Shortwood and Hay Green Local Wildlife Site lies approximately 10m from northern edge of ES15. The implementation of best practice site management will ensure no effects on the closest areas of the LWS during construction. It is not publicly accessible and the nature of the development as employment is such that it would not be affected by the proposals once operational.
- The nearest listed buildings are the Hoyland Low Stand and St.Peters Church (both Grade II listed). Both of these buildings are outside of the Hoyland North Masterplan area (to the south). A buffer zone has been identified as part of the Masterplan proposals to protect the setting of these heritage assets.
- The nearest ancient woodland is to the north ES15 but is but is outside of 50 metre exclusion zone, so should not be affected.
- Sites ES15 and ES17 have been the subject of a comprehensive range of ecological surveys for flora and fauna. The sites are of low overall botanical species/habitat diversity and ecological value, largely due to their homogenous and/or relatively young nature, although small areas of grassland on the western edge of ES17 are of greater interest in the site context. Limited evidence of protected species

6 A Ramsar site is a wetland site designated to be of international importance under the Ramsar Convention.

at the sites was recorded. Bat and breeding bird assemblages and numbers recorded were considered to be generally unremarkable and typical of the habitats recorded.

- Policy ES15 (Rockingham 3) identifies the potential for archaeological remains at the site. An archaeological assessment will therefore accompany the planning application for the site. However, it is noted that the former use of the site as a colliery and associated remediation works means that the ground has been extensively disturbed and the likelihood of finding anything significant is minimal.

The site is a former colliery site (now remediated) with no particular speciality or sensitivity. It is not considered that development of the site will prejudice the relative abundance, availability, quality and regenerative capacity of natural resources in the area.

Cumulative - Hoyland North Masterplan Sites

- Site ES14 is allocated for employment uses and sites HS64, HS56 and HS66 are allocated for residential development within Barnsley Local Plan (see Table 1 p2).
- The Hoyland North Masterplan area is greenfield in nature – previously the subject of coal mining and tipping activity, before being restored.
- Public access via public rights of way – (to be diverted as part of development proposals).
- Presence of grassland hedgerows, trees and woodland. No TPO's or ancient woodland within or adjacent to the site.
- Sites accessed via Dearne Valley Parkway. Access routes to be provided via sites ES14 and ES17 (access route through ES17 to Shortwood roundabout linking with the wider residential parcel to be safeguarded as part of planning application).
- To the north of of the Hoyland North Masterplan sites is the Dearne Valley Parkway, to the south is Hoyland Road and to the east and west is small scale residential development. It is of note that the proposed residential sites are adjacent to the existing residential areas with the employment allocations adjacent to Dearne Valley Parkway.

Geographic information about the natural environment for the Hoyland North Masterplan sites (used to inform the draft Hoyland North Masterplan Framework) has been utilised as part of this assessment which has indicated the following key points:

- There are no RAMSAR Sites, Sites of Special Scientific Interest (SSSI), Special Areas of Conservation or Special Protection areas in the vicinity of the site.
- The sites are within Flood Zone 1 and are at low risk of flooding.
- Landscape is of low to moderate value. The most sensitive groups of trees, hedgerows and vegetation will be retained.
- The Shortwood and Hay Green Local Wildlife Site is sufficiently separated from the Hoyland North Masterplan area and is not publicly accessible, and effects would not be expected.
- The nearest listed buildings are the Hoyland Low Stand and St.Peters Church (both Grade II listed). Both of these buildings are outside of the Hoyland North Masterplan area (to the south). A buffer zone has been identified as part of the Masterplan proposals to protect the setting of these heritage assets.
- In respect of archaeological remains the initial evidence suggests that there are no buried archaeological remains of value particularly given the historic open cast mining activity that the majority of the site has been subject to. On the undisturbed part of the site there is nothing to suggest that remains will be sufficiently significant to prevent development. Notwithstanding this, an Archaeological Assessment would accompany each subsequent planning application for the Hoyland North Masterplan sites.
- The wider Hoyland North Masterplan area has not been subject to detailed ecological surveys, however, aerial mapping indicates habitats to be of apparent similar broad nature and condition to ES17. A review

of the site on the Magic website indicates no designations, habitats or species of nature conservation importance on the Hoyland North Masterplan area, including ES17. The whole Hoyland North Masterplan area site is therefore considered likely to be of overall low ecological value.

The wider Hoyland North Masterplan site is part of former open cast colliery site (now remediated) with no particular speciality or sensitivity. It is not considered that development of the site will prejudice the relative abundance, availability, quality and regenerative capacity of natural resources in the area.

c) Aspects of the environment likely to be significantly affected by the development

The following aspects of the environment will be affected by the proposed development and wider cumulative Hoyland North masterplan development.

- Loss of greenfield open nature of the sites.
- Loss of trees associated with young plantations (particularly part of site ES17). Whilst these trees could not be replaced in their entirety, new habitats would be created as part of biodiversity offsetting measures.
- Alteration to site levels, topography and geotechnical properties to create development platforms.
- Alteration to site drainage/hydrology.

Further potential effects include:

- Increase in vehicle movements on local highway network and associated impact on air quality.
- Loss of grassland, hedgerows, shrubs/scrub.
- Loss of or alteration to habitats within the site, which could affect any dependent fauna.
- Increase in background noise levels.
- Increased demand for local services and infrastructure.
- Impact on archaeological/heritage assets.
- Visibility of development within wider area
- Noise and dust generation during the construction phase.

d) Significant effects of the proposed development resulting from:

i) Residues, emissions and production of waste

The proposed development is not likely to have any significant effects resulting from residues, emissions or the production of waste. Besides the earthworks and construction activity, planning permission is not sought for any processes which will create residues, emissions or the production of waste.

The proposed operational development at the site would be for use classes B1/B2 and/or B8. The proposed uses could therefore be any combination of the following:

- Offices (B1a).
- Research and Development (B1b).
- Industrial processes which can take place in a residential area (B1c).
- General Industry (B2).
- Storage and Distribution (B8).

The Wider Hoyland North Masterplan uses also include the above for site ES14 and residential development (totalling 765 dwellings) at sites HS64, HS56 and HS66.

The proposed development is not considered to give rise to any significant risks of pollution or nuisance, major accidents or risks to human health.

Whilst there will be noise generated from the application proposals, the wider cumulative sites are closer to established residential areas, but of these, the Masterplan sites identified for residential use are closest to these properties and are less likely to generate noise pollution than an industrial development. The development proposals (when considered cumulatively with the Hoyland North Masterplan sites) are unlikely to have a significant impact on noise.

In respect of traffic movements – It is understood that the Dearne Valley Parkway has been designed with sufficient capacity to service the application (sites ES15 and ES17) and the Hoyland North Masterplan sites. Notwithstanding this, the development proposals when considered cumulatively with the Hoyland North Masterplan sites would have an impact on traffic movements. This will be assessed in full as part of the planning application and subsequent applications for the Hoyland North sites.

In respect of air pollution – the site is not within an air quality management area (and therefore has not been identified as an area vulnerable to pollution or requiring an improvement in air quality). Notwithstanding this, Barnsley Council requires an Air Quality Assessment to be submitted when development is over a certain size threshold. Therefore, an Air Quality Assessment is currently being prepared as part of the planning application and subsequent Air Quality Assessments would need to be prepared for each of the Hoyland North Masterplan sites. When considered cumulatively the impact on air quality of the development of the application sites and Hoyland North sites (due to increased traffic movements) could be significant.

The proposed development will be a high quality industrial park and is unlikely to include any uses or processes which would generate significant emissions or pollutants. Similarly, the Hoyland North Masterplan site ES14 is likely to be a high quality industrial unit. The residential Masterplan sites HS64, HS56 and HS66 are also unlikely to generate significant emissions or pollutants.

There is likely to be an impact from the earthworks and construction activity required to create the development. To minimise the likelihood of such risks occurring and to mitigate any impact, all construction activity will be controlled by a Construction and Environmental Management Plan (CEMP) which will be secured by a standard condition of planning permission. Earthworks and construction activity shall also be undertaken in accordance with the recommendations the ground conditions site investigation report which shall be undertaken as part of the planning application process. It is anticipated that a CEMP would also be used for the Hoyland North Masterplan sites.

ii) The use of natural resources, in particular soil, land, water and biodiversity

The proposed development is likely to have a significant effect resulting from the use of natural resources due to its volume. When considered cumulatively, the development will constitute the loss of 79.35 hectares of greenfield land (former colliery land). Albeit, this land is of limited value for amenity.

In respect of the application sites, it is anticipated that there shall be no import or export of soils, with all excavated material being used on site in the formation of development plateaus. In respect of the wider Hoyland North Masterplan site, it is likely that any cut and fill requirements will retain the majority of soil on site (although this is not yet known) as with the exception of part of site HS64 (which has outline planning

permission for 100 units) there are no development proposals for the sites. The Outline Planning Consent for 100 units did not require cut and fill as the site is relatively level.

Earthworks for the development proposals shall be undertaken in accordance with a soil management plan which will be secured by a standard condition of planning permission.

It is anticipated that there will be no 'use' of water resources as a result of the application development beyond that normal to industrial/employment use. Similarly, it is considered that there will be no 'use' of water resources as part of the wider Hoyland North Masterplan development which incorporates industrial/employment use and residential use.

The application development shall be undertaken in accordance with an approved Flood Risk Assessment and drainage strategy which shall be prepared and submitted as part of the planning application process.

There is intended to be no net 'loss' of biodiversity at the application site as mitigation and enhancements (as appropriate) are to be incorporated within the development design and will be secured through planning conditions relating to landscape planting and ecological habitat creation and management. However, there will be a substantial loss of young plantation woodland to facilitate the development. Whilst it will not be possible to replace every tree that is lost, biodiversity net gain will form part of the development proposals in accordance with the NPPF and will include a range of habitats to improve biodiversity value, enhancing existing habitat connections and networks wherever possible on and off site. The green infrastructure design at the application site, will, alongside those retained, incorporate new habitats necessary to mitigate losses and provide gains as far as possible, however it is recognised that due to the anticipated extent of plantation woodland to be removed, there may not be the capacity to sufficiently mitigate these within the red line and off-site mitigation would therefore be necessary to achieve the overall net gain in biodiversity value required. This would be undertaken on additional land owned by Harworth in the vicinity which is not earmarked for development and may include both habitat creation and restoration. It is more difficult to quantify the loss of biodiversity at the wider Masterplan sites as these have not been surveyed in detail. However the draft Hoyland North Masterplan Framework for Hoyland North advises that the area is of low ecological value and that the most sensitive groups of trees, hedgerows and vegetation will be retained, it is therefore unlikely that adverse cumulative effects on biodiversity arising from further losses associated with the wider Hoyland North masterplan would be significantly greater than that at the application sites.

e) Features of the proposed development or any measures envisaged to avoid or prevent what might otherwise have been significant adverse effects on the environment.

The application sites when considered cumulatively with the Hoyland North Masterplan sites are likely to generate significant effects on the environment. For the application proposals these risks will be assessed through the planning application process and then secured by conditions or legal agreements attached to any permission granted. For the wider Hoyland North Masterplan sites these risks have been assessed initially as part of the development of the Masterplan Framework and will be assessed as part of each subsequent application for development.

The avoidance, reduction and mitigation measures anticipated along with the suggested methods of control are summarised at Appendix 2 of this letter.

Conclusion

The application sites when considered cumulatively with the Hoyland North sites are likely to have significant environmental impacts related principally to air quality, traffic movements, ecology and loss of habitat.

However, it is considered that these impacts can be controlled and mitigated effectively through the planning process. The proposed development exceeds the threshold to require screening, this process has led to our conclusion that the application development when considered cumulatively with the Hoyland North sites is EIA development.

If you are in agreement with the above, it would be useful to meet with you to discuss the content of the scoping report for the Environmental Statement. It is considered that the Scoping Report will principally focus on the following:

- Air Quality;
- Traffic Movements;
- Ecology and associated loss of habitat.

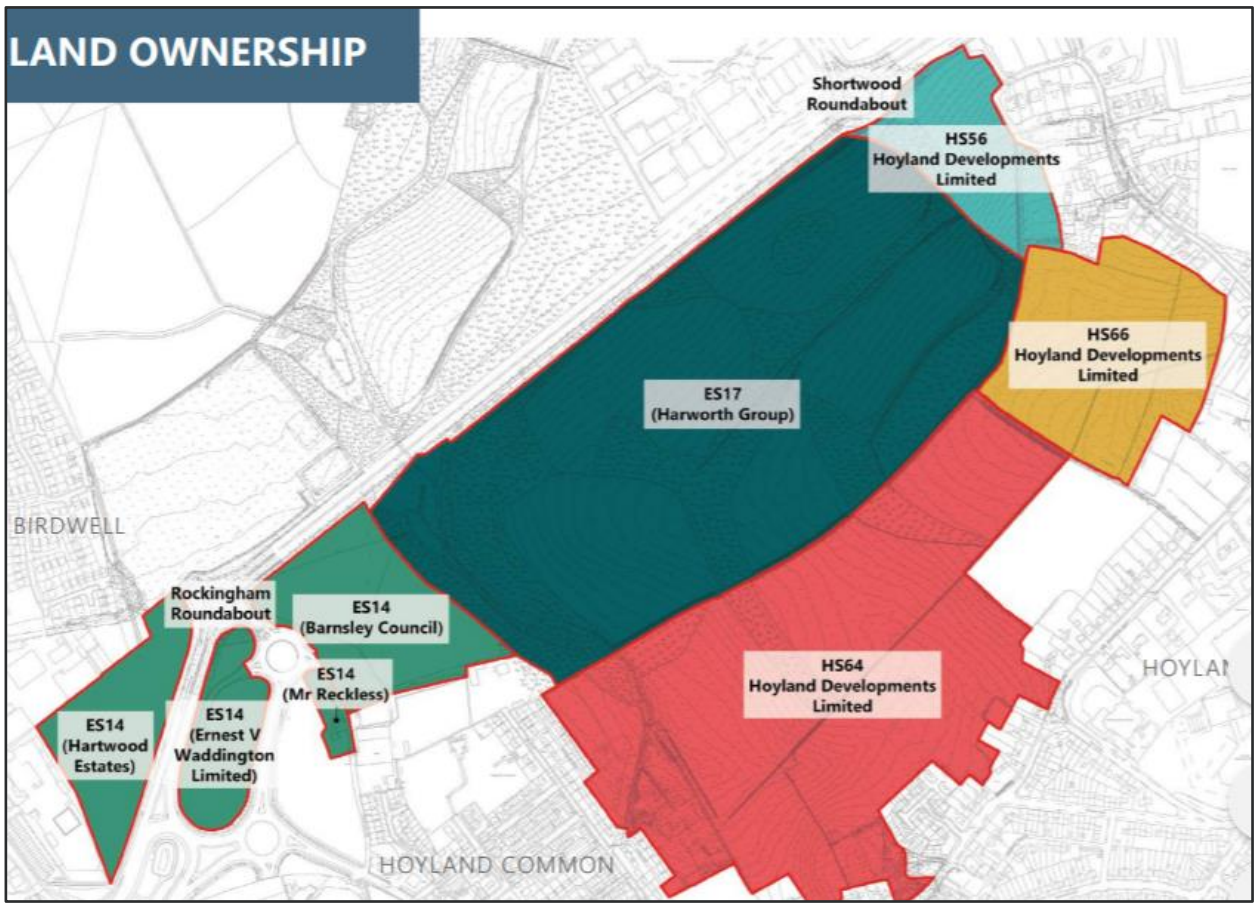
I would therefore be grateful if you could provide your availability for a meeting week commencing 4th November 2019 to discuss the above.

I trust that the above and attached is in order, however, should you have any questions or wish to discuss in more detail please don't hesitate to contact me.

Yours sincerely

Katharine Morgan MRTPI
Associate
Development and Planning
Encs

Appendix 1 – Hoyland North Masterplan Sites



Appendix 2 – Summary of anticipated avoidance, reduction and mitigation measures

Potential Impact	Avoidance/Mitigation	Control
Increased traffic movement on highways network. Application proposals – to be assessed by Transport Assessment. Wider Hoyland North Masterplan Sites – to be assessed by work relayed to Hoyland North Masterplan Travel Plan (currently being prepared).	Travel Plan for application proposals and Hoyland North Masterplan to promote and facilitate sustainable travel.	Legal agreement
Air quality impact resulting from increased traffic movement. For application proposals to be assessed by (Air Quality Assessment submitted with the application). For cumulative sites – subsequent Air Quality Assessments to be prepared.	Potential exceedance of Air Quality Objective when application site is considered cumulatively with Hoyland North Masterplan sites. Travel Plans to promote and facilitate sustainable travel and thereby reduce vehicle movements.	Legal agreement
Dust from construction activity	Works to be undertaken in accordance with a Construction Environment Management Plan.	Planning condition.
Noise impact from proposed employment/industrial development (development proposals). Cumulatively noise impact from employment/residential (site ES14) and residential development proposed as part of the Hoyland North Masterplan.	Proposed development located away from existing residential development. Cumulative Masterplan development has residential sites next to existing units to minimise impact. Site ES14 is set away from existing residential areas.	Planning conditions.

Potential Impact	Avoidance/Mitigation	Control
Noise impact from construction / development traffic both from the application sites and cumulatively with the Hoyland North Masterplan sites.	Works related to the planning application sites to be undertaken in accordance with a Construction Environment Management Plan (CEMP). It is likely that the Masterplan sites will also undertake work in accordance with a CEMP.	Planning condition.
Visual impact on public views for the application site and cumulatively with the Hoyland North Masterplan sites.	Landscape/planting scheme to include perimeter trees/hedges where appropriate.	Planning condition.
Impact on **heritage** assets for the application site and cumulatively with the Hoyland North Masterplan sites.	Appropriate archaeological recording commensurate with significance of on-site assets. No significant impacts or mitigation required in relation to off-site heritage assets.	Planning condition.
Loss of **trees and hedgerows and some semi improved grassland areas** for the application site and cumulatively with the Hoyland North Masterplan sites.	Perimeter tree belts to be retained where possible. Landscape/planting scheme to include new native scrub/trees/hedges and grassland. Retained tree protection measures.	Planning condition.

Potential Impact	Avoidance/Mitigation	Control
Loss of **habitat** and reduction in **biodiversity** for the application site and cumulatively with the Hoyland North Masterplan sites.	It is considered that the measures below could be implemented for the proposed site and the forthcoming Hoyland North Masterplan sites. No removal of trees, hedgerows or scrub during bird breeding season. Implementation of precautionary working methods associated with any other protected or notable fauna as necessary. Lighting scheme to avoid habitat areas where appropriate. Landscape/planting scheme to include habitat creation areas, including a range of semi-natural habitats. Green infrastructure/Biodiversity Management Plan for creation of retained and new semi-natural habitats and landscape planting on and off-site	Planning condition.
Increased **flood risk** on site and/or off site for the application site and cumulatively with the Hoyland North Masterplan sites.	Sustainable surface drainage – via pond(s) on-site attenuation for the application site. Proposed SUD's areas identified as part of draft Hoyland North Masterplan Framework to provide attenuation for the Masterplan sites.	Planning condition.
Impact on foul **drainage** and water supply infrastructure for the application site and cumulatively with the Hoyland North Masterplan sites.	No impact anticipated.	Planning condition and/or provisions of Water Industry Act

Potential Impact	Avoidance/Mitigation	Control
Movement of **soils/material** to or from the site for the application site and cumulatively with the Hoyland North Masterplan sites.	Changes to site levels intended to achieve cut/fill balance in accordance with a soil management plan for the application site. It is anticipated that a similar approach could be undertaken (where necessary) for the other Masterplan sites.	Planning condition.
Impact from **ground contamination** on site for the application site and cumulatively with the Hoyland North Masterplan sites.	Intrusive site investigation and monitoring to be undertaken and remediation strategy to be implemented.	Planning condition.
Impact from site **geology and coal mining** legacy for the application site and cumulatively with the Hoyland North Masterplan sites.	Intrusive site investigation, monitoring and coal mining risk assessment to be undertaken and remediation strategy to be implemented.	Planning condition.

4. Screening Opinion

EIA Screening Opinion under the TOWN AND COUNTRY PLANNING (ENVIRONMENTAL IMPACT ASSESSMENT) (ENGLAND) REGULATIONS 2017

Proposed development of land North and South of Dearne Valley Parkway – Gateway 36 Phases 2 and 3 (Local Plan designations ES15 and ES17)

A request for a screening opinion has been submitted for a hybrid planning application which is being prepared for use classes B1, B2 and B8 development(79,153.4sqm) at Dearne Valley Parkway under the EIA Screening Opinion under the Town and Country Planning (Environmental Impact Assessment)(England)Regulations 2017, as amended).

Background

The new Local Plan was adopted at the full Council meeting held 3rd January 2019 after it was found to be sound by the appointed Planning Inspector following the examination process. This means that it now takes on full weight for decision making process in planning law terms as the development plan for the Borough, superseding the remaining saved policies from the Unitary Development Plan (adopted in the year 2000) and the Core Strategy (adopted in 2011).

The Local Plan identifies significant areas on the outskirts of Hoyland for development over the plan period. These include ES15 and ES17 (employment sites) which will be the subject of this planning application; ES14 employment site and housing allocations at HS64, HS56, and HS66. Barnsley Council have agreed that the screening opinion shall take into account the cumulative effect of the wider development sites. All of these sites (apart from ES15) additionally lie within the Hoyland North Masterplan area, which is intended to bring forward development in a comprehensive manner.

Location and description of the site

Site lies close to and to the north east of Junction 36 of the M1 and lies to both sides i.e. to the north and south, of the Dearne Valley Parkway(DVP), dual carriageway. The site forms two employment allocations within the adopted Local Plan: ES15 to the north of the DVP and ES17 to the south, the latter also forming part of the wider Hoyland North masterplan area described above. Both sites are would be accessed from the DVP, with new accesses formed from a new roundabout (for ES15) and from the existing Shortwood roundabout (ES17).

The sites comprise former colliery sites including open cast which are now remediated and are characterised by dense woodland, although still immature., and grassland. The southern part of the site slopes upwards to the south towards Hoyland Lowe Stand, a Grade II Listed Tower which lies outside the site.

Proposal

A hybrid application is proposed:

- Outline for construction of units up to 79,153.4sqm, construction of SuDs, and associated pipes and swales, construction of drainage pumping station, creation of landscaped areas, including replacement planting. Full application for replacement landscaping, cut and fill earthworks to provide development platforms, construction of new roundabout and access routes to sites ES15 and ES17;
- Full permission will be sought for replacement landscape/habitats to provide biodiversity offsetting/mitigation, earthworks to provide development platforms, construction of new roundabout and access routes to ES 15 and ES17.

Assessment

Having examined Schedule 1 of The Town and Country Planning (Environmental Impact Assessment) Regulations 2017, the proposal clearly does not fall within any of the descriptions of development.

The proposal does fall however under description of development 10(a) (column 1), 'Industrial Estate Development Projects.2. No part of the proposed development however, is located wholly or in part in a sensitive area as defined in regulation 2(1) (which includes scheduled ancient monuments). The area of the proposed development (79.1534 hectares) significantly exceeds the applicable threshold in column 2 of Schedule 2 the applicable threshold of 5 ha in column 2 of Schedule 2 of the 2017 Regulations. The proposed development therefore is Schedule 2 development and potentially requires an EIA.

The size also significantly exceeds the indicative criteria and threshold as set out in column 3 of Schedule 2 as set out in the NPPG at which an EIA is likely to be required is where the site area of the new development is more than 20 hectares. The proposal is for over 79 ha and therefore is therefore likely to require an EIA.

Government guidance advises that, in general, EIA will be needed for Schedule 2 developments in three main types of case:

a) For major developments which are of more than local importance;
b) For developments which are proposed for particularly environmentally sensitive or vulnerable locations; and
c) For projects with unusually complex and potentially hazardous effects.

Based on the information provided, the proposal is considered to be of more than local importance if considered cumulatively with the other proposal sites. The question is therefore, is the proposed development likely to have significant effects on the environment by virtue of its characteristics, location and the nature of the potential impacts as set out in Schedule 3 of the Regulations.

Characteristics

The NPPG states respectively that 'in general, each application (or request for an opinion) should be considered for EIA on its own merits. The development should be judged on the basis of what is proposed by the developer' and 'however, in judging whether the effects of a development are likely to be significant, local planning authorities should always have regard to the possible cumulative effect with any existing or approved development. There are occasions where the existence of other development may be particularly relevant in determining whether significant effects are likely, or even where more than one application for development should be considered together to determine whether or not EIA is required'. In this case, Barnsley Council have agreed that the screening opinion shall take into account the cumulative effect of the wider development sites of the masterplan areas.

In considering characteristics, whilst the proposal exceeds the 5 ha threshold criteria in column 2 of Schedule 2, it significantly exceeds the indicative criteria and threshold set out in column 3 of the NPPG.

In considering the characteristics of the proposed development, extensive urban development for the site would cause significant urbanising effect and changes to the visual impact from short medium and long distance compared to the rural nature the site currently presents. The development would comprise the removal significant number of trees and what is currently wooded areas and grassland pasture would be replaced by extensive urban development. Significant amounts of habitats and biodiversity would be lost as a result. A significant number of vehicle movements would be generated; air quality may be affected as a result. Large drainage ponds would be formed where currently there are none, which

could affect surface water flood risk; views from Hoyland Lowe Stand would be affected. The landform would be affected as a result of the significant earthworks required to prepare development platforms. There may be significant noise impacts as a result of earthworks, construction and operational phases.

Looking at the wider area, development of the masterplan areas would add additional urban impacts similar to those identified above into the locality including noise, emissions, traffic, urbanising effect etc.

Despite these impacts, It is considered that there is no higher risk than average of accidents during construction and operations and that the project is neither unusually complex nor has potentially hazardous environmental effects despite its scale and character.

Location

In considering the location of development, the site was previously developed land used for open cast coal extraction, but has since been reclaimed to greenfield with significant numbers of trees, albeit still young plantations covering much of the area. It is now allocated as Employment Land in the Barnsley Local Plan (adopted 3rd January 2019) and the existing land use is agricultural pasture/rural, so the proposal would have a significant urbanising impact on the existing nature of the site. Although the site is bounded by a dual carriageway (the Dearne Valley Parkway), and is not set within a sensitive area as set out in Regulation 2(1), it is nevertheless considered that the impact, including the impact on landscape, would be significant.

The site lies within a Coal Authority High Risk Referral Area. However, the supporting statement has identified through Phase I and II investigation any coal mining legacy risks and geotechnical aspects from widespread opencast mining and unconsolidated fill have been appropriately addressed and will be remediated where necessary.

The Heritage asset at Hoyland Lowe Stand is considered may be affected to a significant degree in terms of impact of views from the asset.

The location of the site otherwise is of less concern in terms of environmental sensitivity, as the Shortwood and Hay Green Biodiversity sites lie outside the site and would remain unaffected and retain their quality and regenerative capacity.

Overall the natural environment is capable of absorbing the development, as it is not within a wetland, coastal zone, mountain area or nature reserve. It is not designated under the Habitats Directive and environmental quality standards laid down in EU legislation have not been exceeded in this area. The site lies on the edge of a populated area, impact on quality of life is not considered to be an issue for a significant number of people.

Nature of potential impacts

For Industrial Estate Development Projects, the National Planning Policy Guidance document and Column 4 of Schedule 2 of the Regulations as set out in the NPPF advises that in addition to the physical scale of such developments, particular consideration should be given to the potential increase in traffic, emissions and noise.

There would be adverse visual, noise and disturbance, and traffic impacts during the construction period. It is also acknowledged that there may be significant local impacts as a result of the groundworks necessary for preparing the development platforms. However, these would be relatively short term and in the medium to long term and all soils/materials are intended to be retained on site.

Impacts on the landscape and views however would be permanent due to the urbanising nature of the proposal and the formation of the development platforms altering the landform. There would additionally be permanent loss of habitat leading to Ecology/Biodiversity impacts through loss of trees and grassland though replacement is proposed with planting/mitigation/biodiversity gain. Large scale drainage ponds may add an element of surface water flood risk in the long term, however, these too could provide additional biodiversity habitat.

In the operational phase, a modern employment site is likely to generate only additional traffic associated emissions, however, these could be significant due to the scale of the proposals both as an application and cumulatively with the other employment and housing allocations in the area. The impact on junctions proposed may be mitigated by the new accesses proposed onto Dearne Valley Parkway.

There will be loss of agricultural/pasture land, though the quality is not high as it comprises poorly consolidated soils/material over land previously subject to opencast coal mining. Its loss is not considered to be excessive or of significant environmental impact in this area. There are unlikely to be any other significant impacts as a result.

Formal Screening Opinion Summary

1. Having examined Schedule 1 of The Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 2017(as amended), the proposal clearly **does not** fall within any of the descriptions of development.

2. Interpreting Schedule 2 widely, the proposal falls under description of 10(a) Industrial Estate Development Projects, and is therefore Schedule 2 development.

3. No part of the proposed development is located wholly or in part in a sensitive area as defined in Regulation 2(1).

4. The area of the site (red line boundary) **exceeds** the applicable threshold of 5 ha in column 2 of Schedule 2 of the 2017 Regulations. The proposal additionally exceeds the threshold of 20ha set out in the NPPG and is likely to have significant environmental effects as indicated above. The proposed development therefore **requires an EIA.**

Conclusion

In coming to the decision below the authority has taken into account whether the proposed development is likely to have significant effects on the environment by virtue of its characteristics, location and the nature of the potential impacts.
Government guidance in the National Planning Policy Guidance states that, in general, EIA will be needed for Schedule 2 developments in three main types of case:

a) For major developments which are of more than local importance;
b) For developments which are proposed for particularly environmentally sensitive or vulnerable locations; and
c) For projects with unusually complex and potentially hazardous environmental effects.

In assessing the submitted information in the light of the above it is considered that the proposal will have significant environmental impacts within the meaning set out in The Town and Country Planning (Environmental Impact Assessment)(England and Wales) Regulations 2017 (as amended) for the following reasons:

Reasons:

1 **Thresholds in Schedule 2 - T**he scale of the development at approximately 79 ha considerably exceeds the threshold in Schedule 2 column 2 of the Regulations, it also considerably exceeds the indicative threshold criteria of 20ha as set out in the NPPG). The impacts would be even greater when taken in cumulation with the other employment and housing allocations in the local area.

2 **Characteristics of the development -** The proposals are of significant scale, particularly if taken in cumulation with the other employment and housing allocation sites in the area. The scale, nature or type and the site is not unusually contaminated or of challenging landform. However, there may be may be significant local but temporary impacts during the preparation of the development platforms. There would not be an excessive use of or impact on natural resources or excessive production of waste. However, the proposal may result in impacts of air pollution through increase in traffic as a result of the proposal or in cumulation with other allocated sites in the area and impacts due to increased traffic as a result of the proposal. There may also be impacts from increased vehicular movements. The development of the site will also fundamentally affect the characteristics of the area from its current greenfield character to extensive large scale urbanised development comprising large scale employment units (and cumulatively, further employment areas and housing), together with the attendant infrastructure and accesses crossing the land and this will additionally affect views. Large drainage /attenuation ponds required for surface water drainage ponds and Suds installations may themselves introduce a change in the surface water flood risk of the site compared to the existing greenfield nature which is likely to be drained through infiltration when considering he risks of climate change. Despite these impacts, it is considered however, that there is no higher risk than average of accidents during construction and operations.

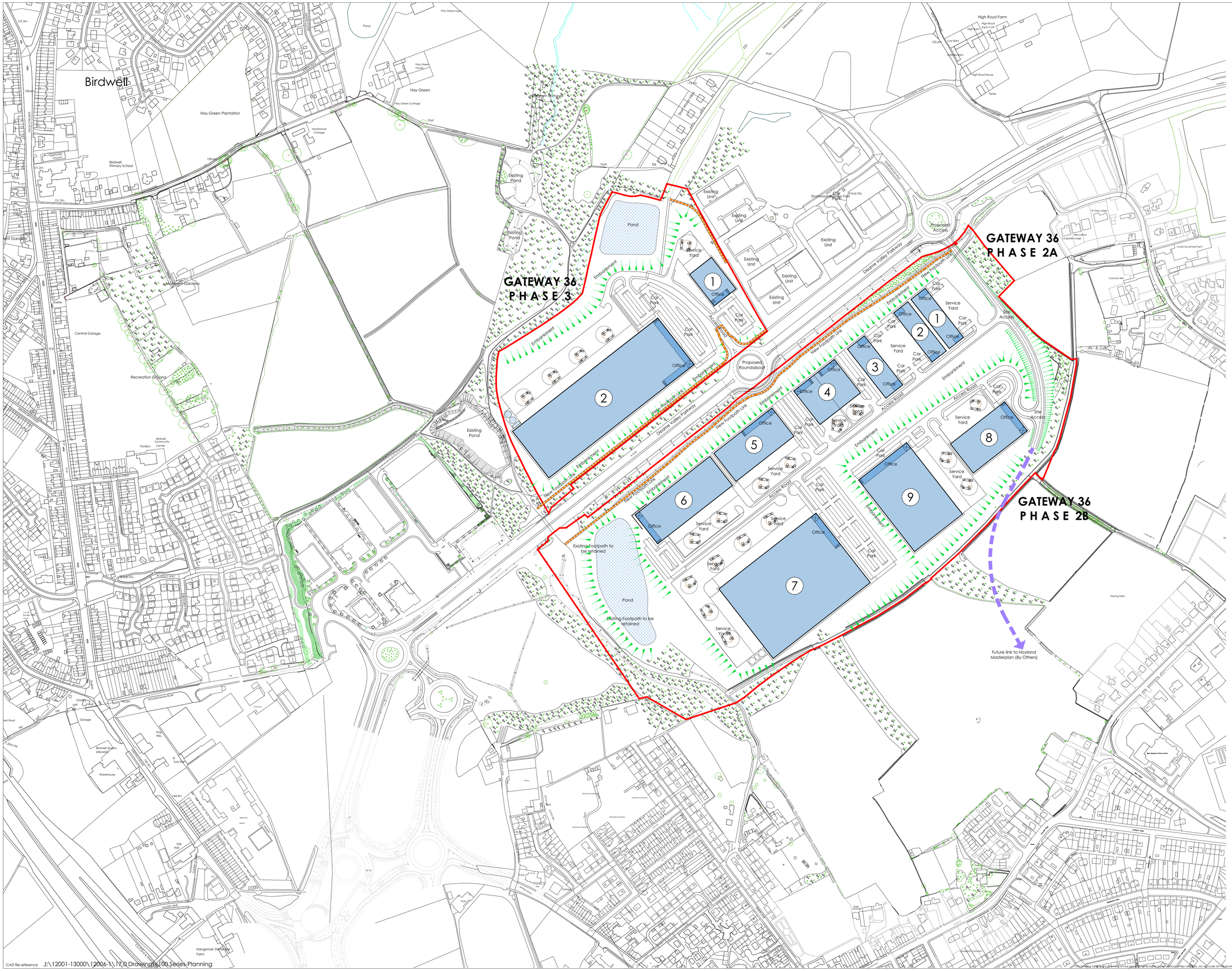
3 **Location -** In terms of location, the site is not in a sensitive area as defined in Regulation 2(1). There are no protected ecology or biodiversity features on the site and the sensitive areas at Shortwood and Hay Green biodiversity sites close by would remain unaffected. Despite this, the site currently contains a significant number of young trees, which will have some ecological/biodiversity value, the majority of which will be lost as a result of the groundworks required to create development platforms. The effects are considered to be significant due to the large size of the site, and cumulatively with the other development sites in the area. In considering historic impact, whilst there are no heritage assets within the site, Hoyland Lowe Stand lies just outside the site and views from the heritage asset will be altered significantly as a result of the change in landform and significant urbanising effect the proposed development.

4 **Scale Of Impacts -** Impacts on landscape, views and character of the landform will be permanent and significant due to the urbanising effect, as will loss of trees and habitat. Noise impacts and impacts due to construction and cut and fill phase may be substantial but or a temporary short to medium term nature. Air quality impacts, traffic impacts and noise impacts as a result of traffic generated by the development may be long term but of moderate impact, but should be considered in accumulation with existing levels and with the wider Hoyland area proposals. Highway impacts in particular may be felt wider than the immediate site area.

In consideration of all of the above, the proposal is likely to have significant effects on the environment and an EIA is therefore required.

OFFICER SIGNATURE	**Elaine Ward**	**DATE 20/11/2019**

5. Scoping Report


NORTH
GATEWAY 36
PHASE 3
GATEWAY 36
PHASE 2A
GATEWAY 36
PHASE 2B
Birdwell
Hay Green Plantation
Birdwell Primary School
Central Garage
Recreation Ground
Birdwell Community Centre
Hay Green
High Royd Farm
Existing Pond
Pond
Existing Unit
Office
Service Yard
Car Park
Embankment
Proposed Roundabout
Proposed Access
Site Access
Access Road
New Footpath Link
Dearne Valley Parkway
Existing footpath to be retained
Existing Footpath to be retained
Future link to Hoyland Masterplan (By Others)
Playing Field
Hangman Stone Farm
Birdwell Quarry (Disused)
Warehouse
Allotment Gardens
Hospital Complex
Rockingham Road
Doncaster Road
Barnsley Road
Moor Lane
Birdwell Lane
Aldwyn Way
Aldwyn Gardens
Aldwyn Avenue
Aldwyn Crescent
Aldwyn Drive
Aldwyn Close
Aldwyn Court
Aldwyn Park
Aldwyn Way
Aldwyn Grove
Aldwyn Mews
Aldwyn Terrace
Aldwyn Place
Aldwyn Square
Aldwyn Walk
Aldwyn Lane
Aldwyn Road
Aldwyn Street

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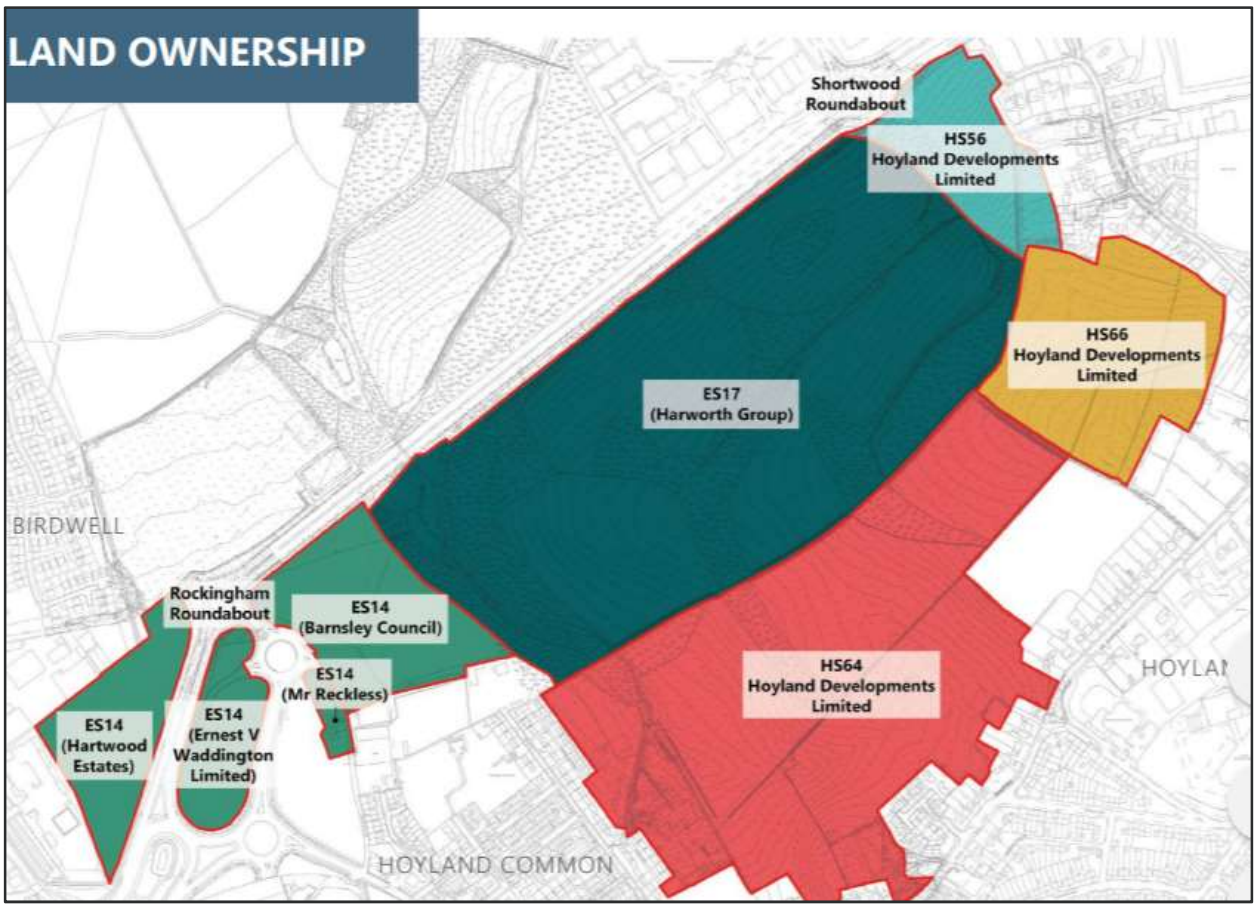
Appendix B – Hoyland North Masterplan Sites



EIA SCOPING REPORT

Land to the North and South of Dearne Valley Parkway Gateway 36 Phases 2 & 3

Harworth Group

Job No: 191DH600

DEVELOPMENT & PLANNING | LEEDS

November 2019

CUSHMAN & WAKEFIELD

CONTENTS

1.	Introduction	4
2.	Context	5
3.	EIA Context	7
4.	Scope of Assessment	10
5.	Technical Assessments	16

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Version	Prepared by	Approved by	Date
EIA Scoping Report	Katharine Morgan BA (Hons) DipTP MRTPI	Katrina Hulse BA(Hons) MA, PGDipLaw MRTPI	November 2019

1. Introduction

1.1 Cushman & Wakefield (C&W) has been instructed by Harworth Group to prepare a Scoping Opinion (under Part 4, Section 15 of The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (hereafter known as the 2017 EIA Regulations) for Land to the north and south of the Dearne Valley Parkway (Gateway 36 Phases 2 and 3 – Local Plan site references ES17 and ES15).

1.2 Environmental Impact Assessment (EIA) is the process of identifying and assessing the significant effects likely to arise from a proposed development. It has been agreed with Barnsley Metropolitan Borough Council (BMBC) that the proposed development is EIA development[1]. The Environmental Statement (ES) will accompany the hybrid planning application to be submitted to BMBC.

1.3 The proposed development will involve the creation of up to 1.1 million sqft (102,193sqm) of floorspace for employment uses (use classes B1/B2/B8), together with associated infrastructure and landscape works. The development will be a hybrid planning application with detailed planning permission sought for earthworks and access and outline planning permission sought for the employment development, internal access routes and landscaping and drainage. In addition, the Environmental Statement (ES) will also consider the cumulative impacts of the Hoyland North Masterplan[2] land.

Purpose of this Scoping Report

1.4 The purpose of this report is provide information to BMBC to enable a Scoping Opinion to be made under Regulation 15 of the 2017 EIA Regulations. This report provides details of the matters likely to have significant effects on the environment and are therefore 'scoped in' to the report. This report provides a summary of each proposed chapter of the ES highlighting the baseline studies undertaken (or currently ongoing), the assessment of likely effects and any issues to be scoped out. The report also highlights those matters likely to be excluded from the ES (see paragraph 4.29, page 14).

[1] Agreed in meeting at BMBC on 12th November 2019.
[2] The Hoyland North Masterplan Framework is due to be considered for approval at Full Council Committee Meeting on 19th December 2019.

2. Context

The Site and its Surroundings

2.1 The proposed application site includes land to the north and south of the Dearne Valley Parkway (Barnsley Local Plan sites ES15 and ES17) in Hoyland, Barnsley (See Site Location Plan at Appendix A). The sites are close to Junction 36 of the of M1 and the project is therefore known as Gateway 36. The project represents the second and third phase of Gateway 36 (The first phase of Gateway 36 is adjacent to site ES15 and has been completed).

2.2 The total area of the application sites is 37.76[3] hectares. Site ES15 slopes down from the Dearne Valley Parkway. Site ES17 slopes steeply upwards from the Dearne Valley Parkway. Both sites will be accessed via the Dearne Valley Parkway, site ES15 from a new roundabout to be created as part of the development and ES17 from the existing Shortwood Roundabout.

2.3 The sites are part of a former colliery (now remediated) and are currently vacant. Both sites are characterised by dense woodland.

2.4 Site ES17 is within the Hoyland North Masterplan area (see Appendix B). Site ES15 is outside this area. The Hoyland Masterplan area also includes the following sites HS64, HS56, HS66 (allocated for residential development in the adopted Barnsley Local Plan) and ES14 (allocated for employment use in the adopted Barnsley Local Plan). It has been agreed with BMBC that the ES prepared for this application will include a cumulative assessment of the Hoyland North Masterplan sites[4]

2.5 The wider area is a mix of industrial development (Gateway 36 and Shortwood Business Park) and open land (which forms part of the Hoyland North Masterplan).

Project Description

2.6 The illustrative masterplan for sites ES15 and ES17 are included at Appendix A. At the current time the development (including the cumulative Hoyland North Masterplan development is as follows:

Sites	Site area (hectares)	Proposed use
Application Sites		
ES15 (North of Dearne Valley Parkway)	9.72	Use classes B1, B2 and B8.
ES17 (South of Dearne Valley Parkway)	28.04	Use classes B1, B2 and B8.
Total	**37.76**	(total floorspace quantum 1.1million sqft)
Cumulative Sites		
ES14	8.71	Employment (use class B1, B2 and B8).

[3] ES15 = 9.72ha and ES17= 28.04ha
4 In accordance with Schedule 3 1(b) of the EIA Regulations 2017(p71).

		A café (Starbucks) has been granted planning permission at part of this site[5].
HS64	19.25	615 dwellings (of which, 100 units have outline planning permission[6]).
HS56	6.39	80 dwellings
HS66	2.6	70 dwellings
Total Cumulative Sites	**36.95**	765 dwellings
Overall Total	**79.35ha**	

Table 1: Schedule of sites[7].

Planning Context

2.7 Barnsley Council adopted their Local Plan in January 2019. The application sites are allocated for employment uses (use class B1/B2/B8) in Policies E1 and E2 (site references ES15 and ES17). The wider Hoyland North Masterplan sites are also allocated for development in the Barnsley Local Plan (see table 1, above).

2.8 The site specific policies for Hoyland North sites require a Masterplan for each area to be prepared and approved prior to the consideration of detailed proposals. The Hoyland North Masterplan Framework has duly been prepared and is going to the Full Council Committee meeting on 19th December 2019 where it is expected to be approved. Once approved, this Masterplan Framework will provide guidance for the development of sites within the Masterplan.

[5] Planning ref: 2018/0745
[6] Planning ref: 2016/1531
[7] The areas for the Hoyland North Masterplan sites in hectares are those identified in the respective Barnsley Local Plan policies

3. EIA Context

Requirement for EIA

3.1 The legislative framework for EIA is set by European Directive 2011/92/EU, as amended by Directive 2014/52/EU (collectively referred to as the EIA Directive). The EIA Directive requires EIA to be prepared for planning permission for certain types of project. For projects in England the European legislative requirements are provided in the Town and Country Planning (Environmental Impact Assessment) Regulations 2017.

3.2 The proposed development is within Schedule 2, 10 (a) Industrial Estate Type Projects of the 2017 EIA Regulations. The site is not located within a sensitive area as defined in the 2017 EIA Regulations, however it is above the thresholds identified within Schedule 2, 10(a)[8]. Accordingly, a screening letter was prepared to identify if there were likely to be any significant environmental effects. As part of this process, BMBC identified a need to include the Hoyland North Masterplan sites (identified in Table 1, page 6) as part of the screening process. A screening letter was duly prepared and submitted to BMBC on 29th October 2019. As part of the screening process it transpired that the development, when combined with the Hoyland North Masterplan sites, would constitute EIA development and would therefore require an ES. The Council has concurred with this view.

Information Required for ES

3.3 Whilst there is no statutory provision as to the form of an ES, it must include the information at Regulation 18(3), Schedule 4 of the 2017 EIA Regulations. The information supplied in the ES must provide a clear understanding of the likely significant environmental effects of the project.

ES Structure

3.4 The ES will be structured logically and will include the following sections:

- Volume 1 - Non Technical Summary
- Volume 2 - Written Statement
- Volume 3 - Appendices

EIA Methodology

3.5 Each environmental topic will form a separate chapter of the ES. For each topic the following criteria will be addressed:

- Methodology and assessment criteria;
- Baseline conditions;
- Identification of likely effects
- Evaluation and assessment of the significance of identified effects (taking into account any mitigation measures proposed as part of the development);
- Cumulative Impacts

[8] (i) The development exceeds 0.5 hectares.

- Identification of any further mitigation measures to avoid, reduce or remedy adverse effects (in addition to those measures which form part of the proposals).

Methodology and Assessment Criteria

3.6 Each topic chapter will provide details of the methodology for baseline data collection and the assessment of effects. Details of the proposed approach for each topic are provided within section 5 of this Scoping Report. Each identified environmental topic will be authored by a specialist in that area. The identification and evaluation of effects will take into account topic specific guidance where available and applicable.

Baseline Conditions

3.7 The baseline conditions are existing and likely future environmental conditions in the absence of the project. Each topic based chapter will include a description of the existing (baseline) environmental conditions. Consideration will also be given to any likely changes between the time of survey and the future baseline for the construction and operation of the project. Where appropriate, this section will be supported by baseline technical reports (included in the ES appendices). The baseline conditions at the sites (and within the wider cumulative area) form the basis of the assessment.

3.8 The consideration of future baseline conditions will also take into account the likely effects of climate change (in so far as these are known at the time of writing). This will be based on information available for the UK Climate Projections project (UKCP18)[9], which provides information on changes in climate for the UK.

Identification of likely effects

3.9 The 2017 EIA Regulations require the identification of the likely significant environmental effects of the project. Each subject chapter will consider the sensitivity of the receptors affected and the likely impact in determining the significance of the effect.

3.10 Receptors are defined as the resource or user that would be affected by the proposed development. The baseline studies for each topic will identify environmental receptors and evaluate their sensitivity to the proposed development.

3.11 Impacts are defined as physical changes to the environment directly attributable to the project. Each topic chapter will identify the likely environmental impacts and assess their magnitude[10]. Impacts will be defined as either adverse or beneficial. Depending on the topic they may also be described as direct (i.e. activities associated with the project), or indirect (impacts on the environment which are not a direct result of the project). Impacts will be divided into those occurring during the construction phase and those occurring during operation.

Significance of Effects

3.12 Effect is the term used to define the consequence of an impact, which is determined by correlating the magnitude of the impact to the sensitivity of the receptor or resource. The significance of the effect depends both on the impact magnitude and the sensitivity of the receptor.

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[9] UK Climate Projections is a climate analysis tool that forms part of the Met Office Hadley Centre Climate Programme.
[10] The assessment of magnitude impact is likely to include the extent of the impact, duration, frequency and reversibility.

3.13 Levels of significance to be used in the assessment are detailed below (in descending order):

- Major;
- Moderate;
- Minor, and;
- Negligible.

3.14 Negligible is defined as having either no effect or the effect would be beneath the levels of perception. These significance levels will be defined for each topic within the methodology sections of each chapter.

Cumulative Effects

3.15 The cumulative effects of the proposed development in conjunction with the Hoyland North Masterplan sites (see table 1, page 6) will be considered.

Mitigation and Monitoring Measures

3.16 The 2017 EIA Regulations state that the ES should include, '*a description of any features of the proposed development, or measures envisaged in order to avoid, prevent or reduce or, if possible, offset likely significant adverse effects on the environment*[11]'.

3.17 The development of mitigation measures will be developed throughout the EIA process in response to the findings of initial assessments. The proposed development will include a number of mitigation measures designed to reduce or prevent significant adverse environmental effects (where practicable). In most cases the proposed measures are likely to result in the enhancement of environmental conditions.

3.18 The topic chapters will therefore take into account all measures proposed as part of the proposed development.

- Primary Mitigation – measures included as part of the project design.
- Construction Mitigation – measures to be employed during the construction phase to minimise environmental impacts (e.g. Construction Environment Management Plan (CEMP).
- Legislative Requirements – measures required as a result of legislative requirements.

3.19 Where needed, further mitigation measures will be identified as part of each topic chapter. These measures will typically prevent, reduce or offset any residual adverse effects on the environment.

3.20 Where appropriate, monitoring measures will be identified.

3.21 A tabulated summary will summarise the effects of the proposed development for each topic chapter within the ES.

[11] Part 5, Section 18, Paragraph 3(b) of 2017 EIA Regulations

4. Scope of Assessment

Work undertaken to date

4.1 The following studies have been undertaken or are currently ongoing in respect of the proposed development:

- Ecological Surveys (FPCR)
  - Desk Study for existing biological data, including designated sites in 2015 and 2019
  - Extended Phase 1 Habitat survey including hedgerows - June 2015; May 2017; October 2019 – whole site
  - Bat activity surveys (static recordings and walked transects) - Monthly May - September 2015 – whole site; Seasonal (June, August, September) 2018 - north of A6195 only
  - Breeding Bird Surveys - Monthly April – June 2015 – whole site; June 2018 - north of A6195 only
  - Reptile Surveys - June and September 2015
  - Water vole surveys - June 2016
  - Great Crested Newt Surveys - Aquatic survey March – June 2015; March – June 2017; eDNA sampling June 2018 – ponds north of Birdwell only
- Air Quality (WYG) – report currently being prepared.
- Transport Assessment and Travel Plan (Mosodi) – report currently being prepared.
- Landscape and Visual Impact Assessment (LVIA) – currently being prepared by Urban Wilderness – (draft viewpoints to follow this submission).
- Noise Survey (WYG) – report currently being prepared.
- Archaeological Report – currently being prepared.
- Flood Risk/Drainage Report (RSK) – currently being prepared.
- Contaminated Land Report (RSK) – currently being prepared.
- Arboricultural Survey (TEP) – currently being prepared.

4.2 The following reports have been prepared to inform the preparation of the Hoyland North Masterplan Framework:

- Transport Access and Appraisal Report (Fore Consulting)
- Hoyland Transport and Access Report (Aecom)
- Utility Services Report (Silcock Leedham).

- Ground Investigation (JPG/WSP/Abbeydale)
- Drainage and Flood Risk Statement (JPG)
- Statement of Community Involvement (WYG).

Topics to form part of the ES

4.3 It is proposed that the ES will include the following topic areas:

- **Air Quality** - When considered cumulatively the impact on air quality of the development of the application sites and Hoyland North sites (due to increased traffic movements) could be significant.
- **Traffic Movements** - The development proposals when considered cumulatively with the Hoyland North Masterplan sites and any other committed development sites that are identified by the LPA would have an impact on traffic movements..
- **Ecology and Associated Loss of Habitat** - The development will involve a substantial loss of young plantation woodland, the impact of which could be significant on local biodiversity. Mitigation will be provided (which may include off site mitigation as necessary) to reduce identified impacts.
- **Landscape and Visual Impact** – it was agreed with BMBC that an LVIA will form part of the ES. This is currently being prepared.

Topics to be scoped out of assessment

4.4 Taking into account initial findings of the above studies together with the knowledge of the site and the wider Hoyland North Masterplan area. It is proposed the following topics are not included in the scope of the ES.

Geotechnical/Ground Conditions

4.5 The site is a former colliery which has been backfilled. Phase 1 and 2 ground condition surveys are currently being undertaken for the ES15 and ES17 sites to inform the planning application with the Phase 1 report, including coal mining risk assessment, to be submitted alongside the application. The latest work has largely confirmed the information gathered in 2014. There is not thought to have been any significant ground contamination identified and the potential risks from the coal mining legacy are now better understood. The geotechnical properties of the soils have been variable, however with some treatment will most likely be suitable for the proposed development.

4.6 In respect of the application sites, it is anticipated that there shall be no import or export of soils, with all excavated material being used on site in the formation of development plateaus. In respect of the wider Hoyland North Masterplan site, it is likely that any cut and fill requirements will retain the majority of soil on site (although this is not yet known) as with the exception of part of site HS64 (which has outline planning permission for 100 units) there are no development proposals for the sites. The Outline Planning Consent for 100 units did not require cut and fill as the site is relatively level.

4.7 Earthworks for the development proposals shall be undertaken in accordance with a soil management plan which will be secured by a standard condition of planning permission.

4.8 It is anticipated that there will be no 'use' of water resources as a result of the application development beyond that normal to industrial/employment use. Similarly, it is considered that there will be no 'use' of water resources as part of the wider Hoyland North Masterplan development which incorporates industrial/employment use and residential use.

4.9 Overall, potential risks are mostly considered to be low to on site and off site receptors with the exception of potential risks identified to on site receptors from ground gas. A scheme of monitoring is currently underway, and all proposed structures will be designed to mitigate any risks identified. Considering the findings of the Phase 1 Geo Environmental Report (and the reports undertaken as part of the Hoyland North Masterplan work) no significant effects on geotechnical or ground conditions have been identified. It is therefore proposed that geotechnical/ground conditions are scoped out of the EIA process.

4.10 Notwithstanding this, the Phase 1 and 2 Ground Investigation Surveys will form part of the planning application for sites ES15 and ES17.

Flood Risk and Drainage

4.11 The application sites ES15 and ES17 are both within Flood Zone 1 and are therefore at low risk of surface water flooding. RSK has identified a limited potential for ground water flooding to occur with potential for groundwater flooding at surface to occur in small parts of the surrounding area. The wider Hoyland North Masterplan area has been assessed as part of the Hoyland North Masterplan work. A Flood Risk Assessment has been prepared for the Masterplan area which confirmed that the wider area is at low risk of flooding. Notwithstanding this, the development proposals will be informed by a Flood Risk Assessment which will be submitted with the planning application.

4.12 The development proposals include sustainable drainage measures (ponds and swales) which will be managed by Harworth (via a management company). A drainage strategy for the sites is currently being prepared and will be included in the application submission. Similarly, drainage has been considered as part of the Hoyland North Masterplan Framework and it is considered that an effective solution can be achieved.

4.13 Taking into account the flood risk and drainage strategy reports prepared for the application site and the wider Hoyland North Masterplan area, the overall potential risks are considered to be low to on and off site receptors. It is therefore proposed that flood risk and drainage is scoped out of the EIA process.

Noise

4.14 A Noise Assessment is in the process of being prepared for the application site including a baseline noise survey at positions representative of nearby existing residential receptors and proposed residential receptors associated with nearby proposed developments within the Hoyland North Masterplan area which have planning approval. The assessment will seek to demonstrate that significant adverse effects in relation to sensitive residential receptors can be avoided from the operation of the proposed development.

4.15 With regard to cumulative effects associated with the Hoyland North Masterplan, there will be an increase in traffic on the local road network. However, large increases in traffic flow are required to generate changes in noise level which are perceptible and even greater increases are required to generate effects which could be significant.

4.16 Whilst there will be noise generated from the proposals it is noted that the residential sites within the Hoyland Masterplan area are closest to the existing residential areas and are less likely to generate noise impacts than an industrial development. Notwithstanding this, the noise generated from the Proposed Development (including traffic noise) will be assessed in full as part of the planning application process.

4.17 Significant effects during the construction phase can be avoided through the adoption of industry standard control measures.

4.18 On the basis of the above it is considered that the development proposals (when considered cumulatively with the Hoyland North Masterplan sites) are not likely to have a significant effect with regard to noise at off-site receptors. It is therefore proposed that noise is scoped out of the EIA process.

Materials (Soil and Waste)

4.19 As stated, the application sites ES15 and ES17 will retain all soil on site to create development plateaus. In respect of the wider Hoyland North Masterplan Site, it is is likely that any cut and fill requirements will retain the majority of soil on site (although this is not yet known) with the exception of part of site HS64 (which has outline planning permission for 100 units) there are no development proposals for the sites. The Outline Planning Consent for 100 units did not require cut and fill as the site is relatively level.

4.20 It is therefore considered that the overall potential risks are considered to be low to on and off site receptors. It is therefore considered that materials/waste can be scoped out of the EIA process.

Social and Economic

4.21 The application sites are allocated sites within the recently adopted Local Plan. The social/economic benefits of the site and the wider Hoyland North Masterplan have therefore already been assessed through the Local Plan process. Notwithstanding this, the Planning Statement submitted with the application will identify the key social and economic benefits. However, it is considered that the proposals will not have a significant environmental effect in social and economic terms. It is therefore considered that this matter can be scoped out of the EIA process.

Material Assets (Archaeology)

4.22 The EIA regulations refer to ‘material assets’ including archaeological heritage. Site Reference ES15 has a policy requirement to consider archaeological issues and include an Archaeological Assessment as part of any planning application.

4.23 In respect of archaeological remains the initial evidence suggests that there are no buried archaeological remains of value particularly given the historic open cast mining activity that the majority of the site has been subject to. On the undisturbed part of the site there is nothing to suggest that remains will be sufficiently significant to prevent development. Notwithstanding this, an Archaeological Assessment would accompany each subsequent planning application for the Hoyland North Masterplan sites.

4.24 It is therefore considered that the overall impact on archaeology is likely to be low and that archaeology can be scoped out of the EIA process.

Planning Policy Context

4.25 The ES will provide an overview of the relevant legislative and planning policy context within each topic chapter. Planning Policy context will also be covered in detail within the Planning Statement submitted with the planning application. It is therefore not proposed to include a separate chapter on planning policy context within the ES.

Climate Change

4.26 The 2017 EIA Regulations require consideration of climate change. A separate climate change chapter is not proposed as climate change will be considered throughout the ES. The proposed approach is detailed below:

4.27 **Climate Change Resilience:** Resilience to climate change will be considered throughout the design process. The ES will provide details of the projects resilience to climate change in chapters 2 (Project Description), 5 (Air Quality) and 8 (Landscape and Visual Impact).

4.28 **Changes to Future Environmental Conditions**: Consideration of changes in baseline conditions (including changes related to climate change) will be included in each ES topic chapter (chapters 5-8). This will be based on information available for the UK Climate Projections project (UKCP18)[12], which provides information on changes in climate for the UK.

4.29 **Effects of the Project on Climate:** An assessment of the amount of carbon generated from operational traffic will be included within chapter 5 (Air Quality) of the ES. The operational process of the proposed development would not involve the combustion of any materials. The design of the proposed development will give consideration to measures to minimise and mitigate greenhouse gas emissions, where possible, such as measures to control energy demand and improve energy efficiency. Such measures will be set out in the project description chapter (Chapter 2) of the ES. It is considered that no further assessment of greenhouse gas emissions is necessary at this stage.

4.30 Taking into account the above approach it is not proposed to include a separate chapter on climate change in the ES.

Structure of the ES

4.31 The structure of the ES is as follows:

Structure of ES	
Non -Technical Summary	Summary of ES using non-technical terminology
Chapter 1	Introduction
Chapter 2	Project Description
Chapter 3	Need and Alternatives Considered
Chapter 4	Environmental Assessment Methodology
Chapter 5	Air Quality
Chapter 6	Traffic Movements
Chapter 7	Ecology and Associated Loss of Habitat
Chapter 8	Landscape and Visual Impact Assessment
Chapter 9	Conclusions

[12] UK Climate Projections is a climate analysis tool that forms part of the Met Office Hadley Centre Climate Programme.

Table 2 – Structure of ES

Summary of Matters to be Scoped Out of ES

4.32 The matters proposed to be scoped out of the ES are summarised below:

- Geotechnical/Ground Conditions;
- Flood Risk and Drainage;
- Noise;
- Materials (Soil and Waste);
- Social/Economic;
- Material Assets (Archaeology);
- Planning Policy Context, and;
- Climate Change.

5. Technical Assessments

Chapter 1: Introduction

5.1 This chapter will provide details of the need for the ES and its structure.

Chapter 2: Project Description

5.2 The 2017 EIA Regulations require an ES to include, '*a description of the proposed development comprising information on the site, design, size and other relevant features of the development'*.

5.3 Chapter 2 will include details of the site and a description of the key components of the proposed development (i.e. the application sites ES15 and ES17 and the Hoyland North Masterplan sites which will be considered cumulatively).

5.4 The description will also include details of the key works and processes at the construction phase and the operational phase.

5.5 Where options remain at the time of assessment (for example in respect of construction techniques), the ES will make clear any assumptions made. Where appropriate, a worst case scenario will be assessed.

5.6 Chapter 2 will also include details of mitigation measures identified and developed through the EIA process which have been incorporated into the proposed design of the development.

Chapter 3: Need and Alternatives Considered.

5.7 Chapter 3 will briefly consider the need for the proposed development. The 2017 EIA Regulations require, '*a description of the reasonable alternatives studied by the developer, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the development on the environment'.*

5.8 This chapter will summarise the reasons for the site selection and provide a description of the alternatives (where applicable) considered during the EIA process, including a description of the alternative indicative layout options considered

Chapter 4: Environmental Assessment Methodology

5.9 This chapter provides details of the overall approach to the EIA together with details of the screening/scoping process, consultation undertaken and the overall approach to the assessment of significance. Topic specific methodologies (such as survey methods) will be provided in each topic chapter.

Chapter 5: Air Quality

Baseline Information

5.10 In respect of air pollution – the site is not within an air quality management area (and therefore has not been identified as an area vulnerable to pollution or requiring an improvement in air quality).

Air Quality Management Areas

5.11 In respect of air pollution – the site is not within an air quality management area (and therefore has not been identified as an area vulnerable to pollution or requiring an improvement in air quality).

5.12 The closest AQMA to the Proposed Development Site is Barnsley AQMA No. 1 which is located 698 m south-west of the site boundary. As part of the air quality assessment, receptors within the AQMA will be assessed to determine any effects in air quality as a result of the Proposed Development.

Existing Air Quality Concentrations

5.13 With reference to the latest Air Quality Annual Status report produced by BMDC, monitoring of air quality within BMDC is undertaken through continuous and non-continuous monitoring methods. These have been reviewed in order to provide an indication of existing air quality in the area surrounding the proposed development site.

Continuous Monitoring

5.14 BMBC operated a network of three automatic monitoring stations in 2018. The closest automatic monitoring station is located approximately 4.2 km north from the site boundary.

5.15 The closest monitoring station results are presented in Table 3 (below).

Site ID	Location	Site Type	Distance to kerb of nearest road (m)	Inlet Height (m)	NO_2 Annual Mean Concentration 2018 (µg/m^3)	PM_{10} Annual Mean Concentration 2018 (µg/m^3)
CM1	Barnsley A635 Roadside	Roadside	5.0	1.45	-	18.0
CM2	Barnsley A628 Roadside	Roadside	3.5	1.70	32.0	-
CM3	Barnsley Gawber	Urban Background	N/A	4.00	16.0	-

Table 3: Automatic Monitoring Locations

5.16 Table 3 above illustrates, no automatic monitoring stations monitored exceedances of the relevant AQO (40 µg/m3 for NO_2 and PM_{10}) during 2018.

Non-Continuous Monitoring

5.17 BMBC operated a network of 55 passive diffusion tubes in 2018. The closest diffusion tube DT24 is located approximately 321 m south-west from the site boundary.

5.18 The closest NO_2 diffusion tube monitoring results from within BMBC are presented in Table 4.

Site ID	Location	Site Type	Distance to kerb of Nearest Road (m)	Inlet Height (m)	NO_2 Annual Mean Concentration 2018 (µg/m^3)
DT24	A6135 Hoyland	Kerbside	1.0	2.80	30.2
DT25	A61 Sheffield Road, Birdwell	Roadside	1.5	2.90	34.3
DT26	A61 Sheffield Road, Birdwell	Roadside	1.5	2.80	40.1

Site ID	Location	Site Type	Distance to kerb of Nearest Road (m)	Inlet Height (m)	NO_2 Annual Mean Concentration 2018 (µg/m³)
DT27	A61 Sheffield Road, Birdwell	Roadside	N/A	2.90	39.1
DT28	Tankersley School	Roadside	N/A	2.80	23.9
DT29	Moor Lane, Birdwell	Urban Background	N/A	2.70	27.6
DT30	The Walk, Birdwell	Roadside	N/A	2.60	29.5
DT31	Sheffield Road, Birdwell	Roadside	2.5	3.00	29.7
DT32	Sheffield Road, Chapel Street, Birdwell	Roadside	N/A	2.75	32.8

Table 4: Nitrogen Dioxide Diffusion Tube Monitoring Locations

5.19 Table 4 above illustrates that diffusion tube locations DT26 monitored exceedances of the AQO (40 µg/m³) in 2018. With all other identified diffusion tube locations monitoring no exceedances of the AQO of 40 µg/m³ in 2018.

Sensitive Receptor Locations

5.20 As part of the Air Quality Assessment, both human health and ecological sensitive receptor locations will be assessed. All sensitive receptors will be positioned in worst-case locations, including a major road junction and within the AQMA.

5.21 The specific receptors which will be included as part of the assessment will be determined through the availability of traffic data from the Transport Consultants.

Assessment of Effects

5.22 The Air Quality Assessment will include consideration of construction and operational effects both for the application sites (ES15 and ES17) and the wider Hoyland North Masterplan area.

5.23 The approach to the Air Quality Assessment will be consistent with the EPUK/IAQM guidance documents including: Guidance on the Assessment of Dust from Demolition and Construction (January 2014) and Land-Use Planning & Development Control: Planning for Air Quality (January 2017).

5.24 Additionally, the assessment will be in accordance with Defra Local Air Quality Management Guidance (LAQM TG(16), February 2018). Additionally, the Air Quality Assessment will be undertaken in accordance with the BMBC 'Air Quality and Emissions Good Practice Planning Guidance.

Construction Phase

5.25 A construction phase assessment will be undertaken, and appropriate mitigation implemented in accordance with the IAQM Guidance on Assessment of Dust from Demolition and Construction, 2014.

5.26 For construction, the IAQM guidance states that, with appropriate mitigation in place, the effects of construction dust will be 'not significant'. The assessment thus focuses on determining the appropriate level of mitigation to ensure that effects will normally be 'not significant'.

5.27 Construction traffic is not expected to be significant and as such will be scoped out of the assessment and the EIA Assessment.

Operational Phase

5.28 A detailed air quality modelling assessment will be completed in accordance with the latest IAQM and Defra guidance. The outcomes of this assessment will be used to determine the significance of any impacts and appropriate mitigation or offsetting measures.

5.29 Following a review of the existing air quality climate surrounding the proposed development site, the monitoring was around the AQO of 40 µg/m^3 during 2018. The air quality assessment will be produced to determine any effect on the existing air quality climate. A technical report will be produced, where air quality will be assessed at a range of worst-case receptors, including those within the AQMA.

Cumulative Phase

5.30 The traffic data used in the air quality modelling for the earliest opening year scenario will be inclusive of traffic from associated with the Hoyland North Masterplan sites.

Issues Proposed to be Scoped Out

5.31 As there are no significant odour sources surrounding the Proposed Development site, it is considered that odour can be scoped out of the Air Quality Assessment.

5.32 Additionally, as part of the Operational Phase Assessment, no significant sources of dust are proposed as part of the scheme. Given that no sources of dust are proposed, it is considered that the effect of Operational Dust emissions can be scoped out of the Air Quality Assessment.

Chapter 6: Traffic Movements

Baseline Information

5.33 The site is situated to the north and south of the Dearne Valley Parkway. The site is not directly serviced by public transport due to its vacant nature.

5.34 A public transport access strategy is currently been discussed with Harworth and the LPA which will continue to ensure synergy between the proposed development and those in the vicinity.

5.35 Due to the location of the proposed development and its relationship with existing bus services in the area, it is anticipated at the time of writing that the public transport strategy will include the following:

- Enhanced pedestrian and cycle connectivity to existing high frequency public transport services to the south of the development on the B6096;
- Coordinated approach to provide additional pedestrian and cycle connections to high frequency public transport services on Sheffield Road.

5.36 It is proposed to enhance connections to existing services as opposed to seeking to divert services because this is deemed to offer better value and also will be more attractive to public transport users and increase catchment and therefore patronage.

5.37 To divert bus services to penetrate the site in cul-de-sac where they have to double back will be detrimental to existing users and not encourage new users.

5.38 The walk distance between the proposed development and the existing bus stops may be longer than desired but due to the high frequency nature of the bus services it means that the overall journey time will be reduced because there is less time waiting at bus stops. Also, the time spent on the bus is shorter and therefore a slightly longer walk time is preferred. When combined with the high frequency bus service, it offers a better solution i.e. high frequency bus and high-quality walking environment is preferred over a slightly reduced walk time with a less frequent service.

5.39 Additional pedestrian and cycle connections are being considered to provide better north/south connection under the A6195.

Proposed Approach

5.40 A number of site specific baseline studies and surveys will be used to inform the assessment including the following:

- Site visits;
- Existing traffic flow data (including Aecom data);
- Hoyland North Masterplan Transport Access Appraisal Report (Fore Consulting);
- Details of public transport services;
- Details of existing pedestrian, cycle and equestrian routes, and;
- Personal injury accident data.

5.41 The following surveys have been undertaken and the data will include the following:

Manual Classified Turning Counts

- A6135 Sheffield Rd / Holyland Rd / Tankersley Lane;
- Rockingham Roundabout (Sheffield Rd / A6195);
- Shortwood Way/ A6195 Dearne Valley Parkway; and
- M1 Junction 36.

Automatic Traffic Counts

- A61 Westwood New Road;
- A61 Sheffield Road;
- A6135 Sheffield Road; and
- A6195 Dearne Valley Parkway.

Assessment of Effects

5.42 The assessment to be included in Chapter 6 of the ES will focus on:

- Identification of movements to be generated during the construction and operational phase for the proposed development (i.e. ES15 and ES17 and the Hoyland North Masterplan sites).
- Consideration of the environmental effects of traffic during the construction and operational phases of development.
- Effects on public rights of way during construction.

- Consideration of the need for local highway improvements (including improvements to pedestrian and cycle links).

5.43 The assessment of construction and operational effects will be based on a quantitative assessment of increases in traffic flows. If significant increases are predicted, consideration will be given to impacts on junction capacity and delays on the highway network.

5.44 Consideration of the environmental effects of traffic will be undertaken with reference to published guidance including the 'Guidelines for the Environmental Assessment of Road Traffic' published by the IEA.

5.45 In considering whether the development will generate significant environmental effects in respect of highways , the tests in the IEA guidelines will be taken into account:

- Test 1: include highway links where traffic flows will increase by more than 30% (or the number of heavy goods vehicles will increase by more than 30%); and

- Test 2: include any other specifically sensitive areas where traffic flows have increased by 10% or more.

5.46 In the event that thresholds are exceeded, consideration of the environmental impacts of traffic will be undertaken including:

- Severance;
- Driver delay;
- Pedestrian delay and amenity; and
- Accidents and safety.

5.47 Where relevant, consideration of the effects on traffic in respect of air quality will be considered within chapter 5 of the ES.

5.48 The assessment will consider the need for mitigation during construction and operation to be agreed with BMBC.

Issues Proposed to be Scoped Out

5.49 No issues are proposed to be scoped out of Chapter 6.

Chapter 7: Ecology

Baseline Information

5.50 The Site supports no nature conservation designation, no statutory international or national level sites of nature conservation importance are present within 5km and 2km of the Site, respectively. Two non-statutory Local Wildlife Sites lie within 1km of the Site, the closest of which is Short Wood and Hay Green LWS and Ancient Woodland, situated approximately 20m north of the Site boundary. No statutory national level sites are located within 2km of the Site.

5.51 Habitats at the site predominantly comprise improved grazed grassland and young plantation woodland both of limited species diversity and structurally homogenous, and of low inherent ecological value as a result. A small area of native broadleaved woodland, several native hedgerows; small areas of generally species-poor grassland, standing water in the form of two

ponds and scattered scrub are also extant. Whilst not considered to be of high ecological value, they provide small areas of greater interest and habitat/species diversity within the context of the Site and immediate surrounds.

5.52 Typical of the site's habitats, limited evidence of protected species has been recorded. The Site supports no habitat for roosting bats. Bat activity surveys recorded an unremarkable assemblage in terms of both species and numbers recorded, typical of the habitats and location recorded. Survey results did not significantly differ in 2018 from those in 2015. The breeding bird assemblage was also typical of the habitats recorded, with the young plantation and scrub areas of most value to breeding birds, although numbers recorded were considered to be low overall and no particularly rare species or assemblages were recorded. Survey results did not significantly differ in 2018 from those in 2015. No evidence of badger has been recorded at the Site during any survey. Small areas of suitable habitat for reptiles occurs, although no reptiles have been recorded. No evidence of water vole has been recorded, Pre-existing records for 2013/2014 indicate a single GCN previously recorded in one off-site pond to the immediate west of the Site, north of the A6195 and GCN nymphs in the pond adjoining the Site to the west, south of the A6195. Surveys since 2015 by FPCR have recorded no GCN in any pond surveyed including the aforementioned ponds, and eDNA surveys on two ponds north of the site also recorded negative for GCN presence.

Proposed Approach

5.53 The baseline of the site and local area context has been determined through a series of desk and field surveys as outlined in Section 4,

5.54 A qualitative and quantitative ecological impact assessment will be undertaken from this baseline following the principles set out in the Chartered Institute of Ecology and Environmental Management publication "Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland: Terrestrial, Freshwater, Coastal and Marine" (September 2018).

5.55 This will include an assessment of the nature conservation value/sensitivity of the site/ecological features including the following criteria as suggested in this guidance; International, National, Regional, County, District, Local and Site. The sensitivity of an individual ecological receptor is a product of various factors including; habitat extent or species population size (at a given geographical level); habitat or population fragility (including ability to recover); the rarity of a species or habitat; and; inherent susceptibility to environmental change (eg from disturbance or pollution).

Assessment of Effects

5.56 Identified effects will be assessed in terms of their magnitude, extent, duration, reversibility, timing and frequency, confidence in predictions and whether they are positive (beneficial) or negative (adverse). Significance will be based on the likely impact on the integrity or conservation status of the feature and is placed within a geographic scale of context. Indirect effects of the proposed development outside the site on flora, fauna and designated sites will be assessed as required including a cumulative assessment of other proposed development in the vicinity. Effects will be assessed for both the construction and operational phases of the development. Residual effects, should these remain following mitigation, will be identified.

5.57 Proposals will be produced to mitigate or avoid adverse effects where possible. Distinction will be made between any compensation and mitigation required as a result of any identified effects and opportunities for ecological enhancements within the proposed development above this will be identified and used to promote a net gain in biodiversity across the proposed

development. In particular, these will aim to incorporate the goals of the local Biodiversity Action Plan.

Issues Proposed to be Scoped Out

5.58 Following the initial phase 1 habitat assessment, the following surveys were scoped out:

- Winter bird surveys – habitats at the Site were considered unlikely to support significant assemblages of notable overwintering birds. No sites designated for their importance to wintering birds occur within the local search area. Wintering bird surveys were therefore scoped out of the assessment at an early stage.

Chapter 8: Landscape and Visual Impact

Baseline Information

5.59 The application sites comprises open land (densely forested in places) and formed part of a former colliery (now remediated). The wider Hoyland North Masterplan site also formed part of the former colliery site.

5.60 The application sites and wider Hoyland Masterplan area is not subject to any statutory designation or non-statutory local landscape designation. The Hoyland North Masterplan area has been assessed for visual and landscape effects as part of the preparation of the Hoyland North Masterplan Framework. The nearest listed buildings are the Hoyland Low Stand and St. Peters Church (both Grade II listed). Both of these buildings are outside of the Hoyland North Masterplan area (to the south). A buffer zone has been identified as part of the Masterplan proposals to protect the setting of these heritage assets.

5.61 The assessment will include up to ten viewpoints to be agreed with BMBC[13].

Proposed Approach

5.62 The baseline assessment will include an appraisal of the landscape and townscape within the study area. The studies will examine how the proposed development will affect individual features in the area. The baseline assessment will draw on a combination of desk studies and field surveys, relevant character assessment will also be considered.

Assessment of Effects

5.63 The landscape and visual impact chapter will identify and assess the likely significant effects that would arise as a result of the proposed development on key receptors and the visual amenity of the area.

5.64 The assessment process will be based on the current published guidelines for landscape and visual assessment provided by the Landscape Institute.

5.65 As part of this assessment key viewpoints will be identified (and through consultation with BMBC) agreed to enable the LVIA to be prepared.

[13] The LVIA Consultant (Urban Wilderness) will contact the Council separately to agree these viewpoints.

5.66 Plans will identify visual receptors, receptor sensitivity, the magnitude of change and significance of predicted impacts.

Issues Proposed to be Scoped Out

5.67 The proposed development would have no effect on seascape. An assessment of seascape effects is therefore proposed to be scoped out of the assessment. The site is not immediately adjacent to existing residential properties, and therefore a residential amenity assessment, other than the consideration of private viewpoints, is proposed to be scoped out of the EIA process.

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6. Scoping Opinion

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My Ref: 2019/ENQ/00882
Your Ref:
Date: 17th January 2020
Enquiries to: Elaine Ward
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Dear Katharine
EIA DEVELOPMENT ENVIRONMENTAL STATEMENT SCOPING OPINION – Proposed employment use to north and south of Dearne Valley Parkway (Partly Hoyland North Masterplan area) - Outline for layout, full for access

I refer to the scoping report received in connection with the above proposed development and your request for a "scoping opinion" for an Environmental Statement which is scheduled to accompany the application.

The Council agrees that the topics listed in the scoping report dated November 2019 would provide sufficient coverage for the Environmental Statement which is scheduled to accompany the planning application. Namely these are:-

- Air Quality
- Traffic Movements
- Ecology and Associated Loss of Habitat
- Landscape and visual impact

The consideration of traffic impacts will be subject to clarification of the Transport and Access and Appraisal Report (Fore consulting) . A meeting is due shortly between the Highways Authority and Highways England to progress this, however, this should not delay the preparation of the Environmental Statement.

The EIA should reference Barnsley's Landscape Character Assessment 2002 and its review in 2016 which was undertaken in preparation for the Local Plan. I attach links below.

https://www.barnsley.gov.uk/media/4585/eb86-barnsley-landscape-character-assessment.pdf

https://www.barnsley.gov.uk/media/4582/eb87-barnsley-landscape-character-assessment-2016-update.pdf

I would reiterate that the draft view points of 22nd November are acceptable, however, an additional viewpoint should be added near to the new gyratory system to the west of the site on the approach from J36 of the M1 as suggested

in the email from Andrew Burton on 29th November 2019 and the following comments from Alison Dalton's email of 2nd December. 2019

- View to/from Hoyland Lowe Stand and St Thomas' Church of Hawshaw Lane
- Views into the site from Shortwood Roundabout given that this will be the main entrance into the Masterplan Framework area
- Views from Rockingham Roundabout given that this is the main gateway from junction 36 of the M1
- Views to/from Wentworth Castle Gardens (further afield but Historic England considered this a key view from/towards Hoyland Lowe Stand)

CONSULTATIONS
The following internal and external consultees were contacted in order to seek their views on the scope of the ES:-

Internal:-
Air Quality Pollution Control Officer – Chris Shields
Biodiversity Officer – Trevor Mayne
Highways – Jason Thomas
Public Rights of Way – Rik Catling
Conservation Officer – Tony Wiles
Pollution Control – James Gardham
Drainage – Ian Grayson
Legal Services – Bob Power
Tree Officer – Ed Jowett
South Yorkshire Mining Advisory Service – Paul James
South Yorkshire Archaeology Service – Andy Lines

External:- Coal Authority

The consultation responses received have been forwarded to you separately and should help inform thepreparation of your Environmental Statement. I would remind you that it is a statutory requirement to prepare a non-technical summary to sit alongside the ES to enable non-experts to understand its findings

RECOMMENDATION

This letter represents the Council's "scoping opinion". The contents of this letter, including the comments from consultees, should be taken into account when preparing the version of the Environmental Statement to accompany the planning application.

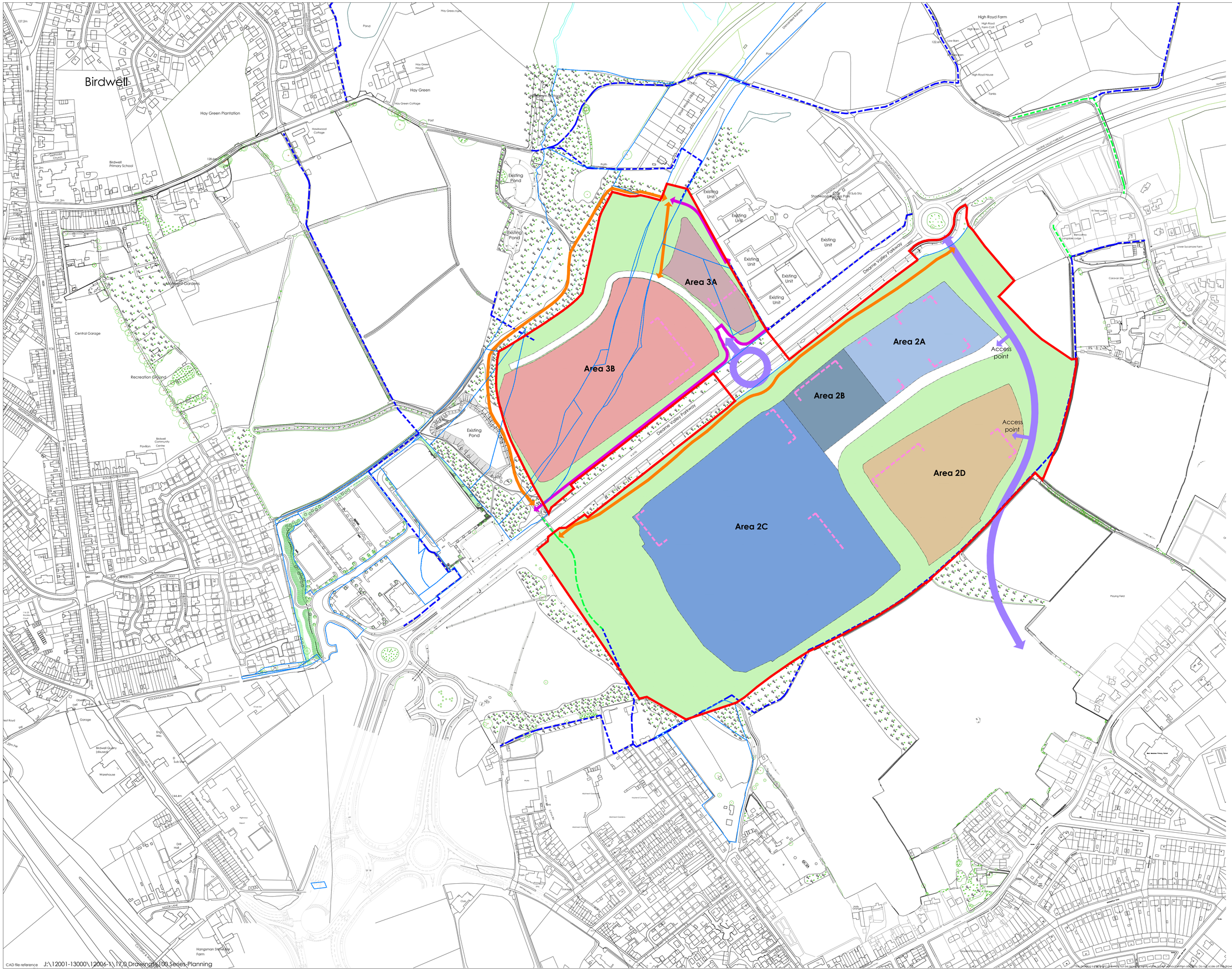
Any additional comments from consultees subsequently received will be forwarded on to you and should be taken into account when preparing the planning application and Environmental Statement.

I trust this information will be of assistance to you.

Yours faithfully

For and on behalf of
Development Management
Joe Jenkinson BA (Hons) MSc
Head of Planning and Building Control
www.barnsley.gov.uk/developmentmanagement

7. Parameters Plan



Key

- Land Ownership
- Application Boundary
- Existing PROW
- Existing Bridleway
- Proposed Footpath Diversion
- Indicative proposed New footpaths / cycle Links
- Proposed Active Frontage Zone
- Proposed Highways access points

Colour Key

- Soft landscape framework areas

Area 2A
Max. FFL: 148.5 m
Max. building height: 10.5 m

Area 2B
Max. FFL: 147.0 m
Max. building height: 18.5 m

Area 2C
Max. FFL: 147.0 m
Max. building height: 21.5 m

Area 2D
Max. FFL: 160.50 m
Max. building height: 12.0 m

Area 3A
Max. FFL: 129.5 m
Max. building height: 12.0 m

Area 3B
Max. FFL: 128.5m
Max. building height: 18.5 m

Note:
Information is based on OS map and received information and is subject to full topographical and building survey.
Assumed site boundary and site constraints subject to confirmation.
All Legal easements and extent of existing underground services locations are subject to confirmation.

0 25 50 75 100 125 m
SCALE 1:2500

Rev	Date	Description	Rev By	Chk'd By

Project Title	PROPOSED INDUSTRIAL DEVELOPMENT Dearne Valley Parkway Rockingham Barnsley
Client	HARWORTH GROUP
Status	FOR PLANNING
Scale	1:2500 — Drawing Size A1
Date	12.2019 — Drawn By NBB — Checked JMR
Drawing Title	PROPOSED PARAMETER PLAN
Job-Dwg No	12006-1-106 — Rev -

2 St. Johns North,
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Carvers Warehouse, 77 Dale Street,
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8. Presentation Boards

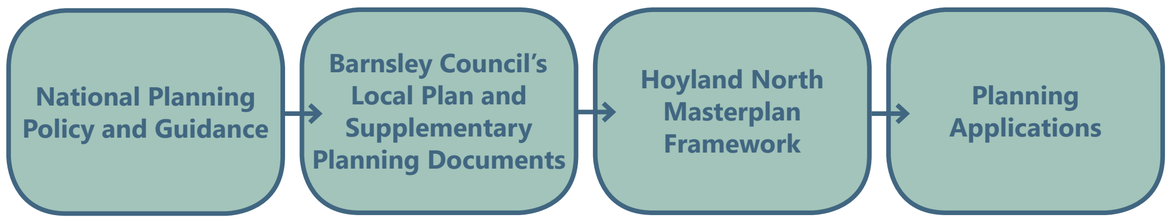
Introduction

Vision: Through a bespoke Masterplan Framework create a sustainable and inclusive community on the edge of Hoyland comprising around 765 new homes and 37 hectares of employment land with associated infrastructure. The new community would be of a high quality design within a strong landscape setting that responds positively to the surrounding environment and enables connectivity and integration with the existing community.

What is a Masterplan Framework and why is it required?

The council's Local Plan was adopted on 3 January 2019. When the Local Plan was being examined it was agreed that for some of the larger, strategic sites it was necessary to prepare masterplan frameworks to ensure that sites could be developed in a comprehensive manner taking into account cumulative infrastructure requirements. Looking at large allocations in this way, rather than a on a site by site basis, ensures that we can make the best use of sites and secure sustainable and inclusive growth reflecting each of the council's corporate priorities.

The Masterplan Framework is a strategic document that sits beneath the Local Plan and will inform future planning applications.



As part of the Masterplan Framework residents and stakeholders need to be provided with the opportunity to feedback on the draft plans and main themes. This feedback is then reviewed and fed into the final Masterplan Framework. The Masterplan Framework will need to be approved by Cabinet before determining any key planning applications.

Who is involved?

Barnsley Council are working in collaboration with WYG, developers and land agents who have the largest land interests, these are Harworth Group (ES17) and Hoyland Developments Limited (HS56, HS64 and HS66). Developers who have smaller land interests on sites which make up ES14 are also being consulted.

Background work

There is a significant amount of technical work that is currently shaping the Masterplan Framework, this work is ongoing and will help shape the final version of it.

Masterplan Framework area

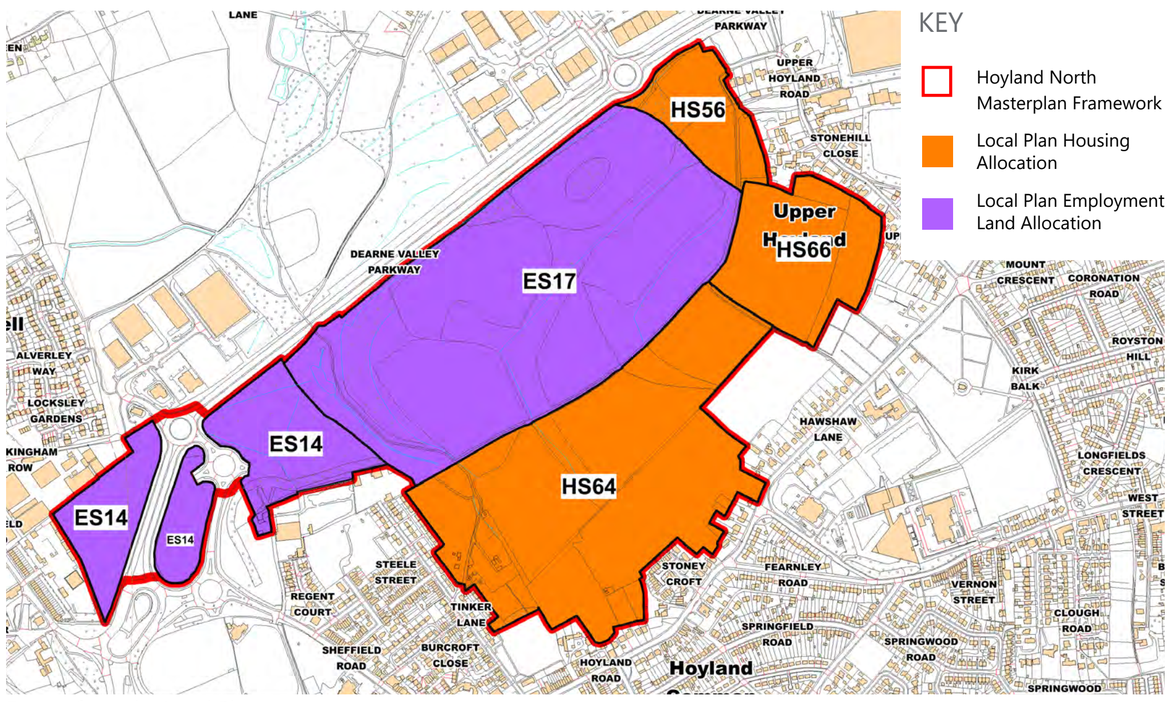
The Hoyland North Masterplan Framework area is located to the north of Hoyland Common, approximately 5.9km south of Barnsley town centre and immediately west of Junction 36 of the M1 motorway. The Masterplan Framework area contains open fields and agricultural land which gently slopes from Hoyland Common to the Dearne Valley Parkway (A6195).

North	Dearne Valley Parkway beyond which is Shortwood Business Park and Gateway 36 employment units
East	Residential properties facing onto Upper Hoyland Road
South	Hoyland Lowe Stand, St Peters Church Cemetery, residential properties facing onto Hawshaw Lane and Hoyland Road (B6096)
West	King George V Playing Field, residential properties facing onto Tinker Lane, Rockingham Street and Church View, Hoyland Dismantling and Rockingham Business Park

Rockingham Roundabout is located to the north-western part of the Masterplan Framework area and Shortwood Roundabout to the north-eastern part. Both of these roundabouts provide access opportunities into the Masterplan Framework area.

SITE LOCATION

Site Location looking east from junction 36 on the M1



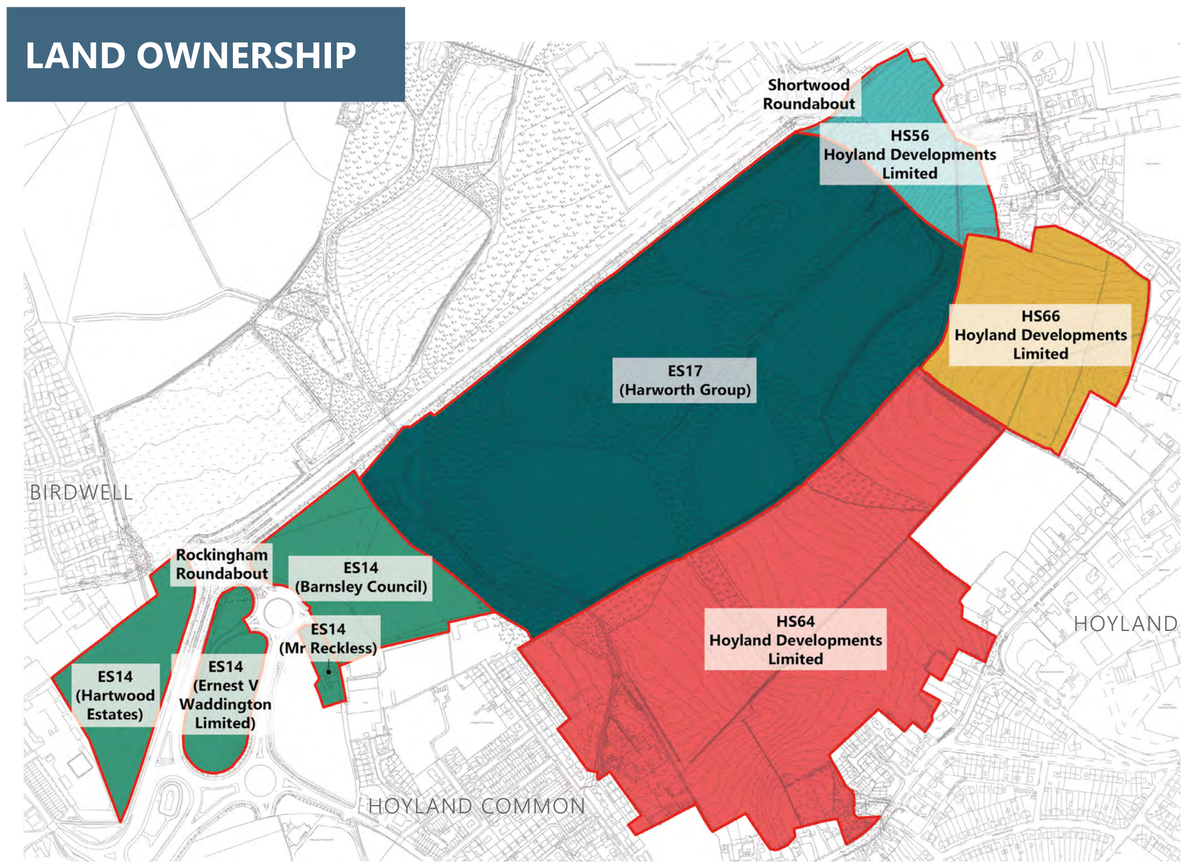
Extract from the Local Plan

Local plan site allocations and level of anticipated development

Residential		
Site reference	**Site area (Hectares)**	**Proposed use**
HS64	19.25	615 dwellings
HS56	6.39	80 dwellings
HS66	2.6	70 dwellings
Total	**28.24**	**765 dwellings**

Employment		
Site reference	**Site area (Hectares)**	**Proposed use**
ES14	8.71	Employment – Business, General Industry and Storage and Distribution
ES17	28.6	Employment – Business, General Industry and Storage and Distribution

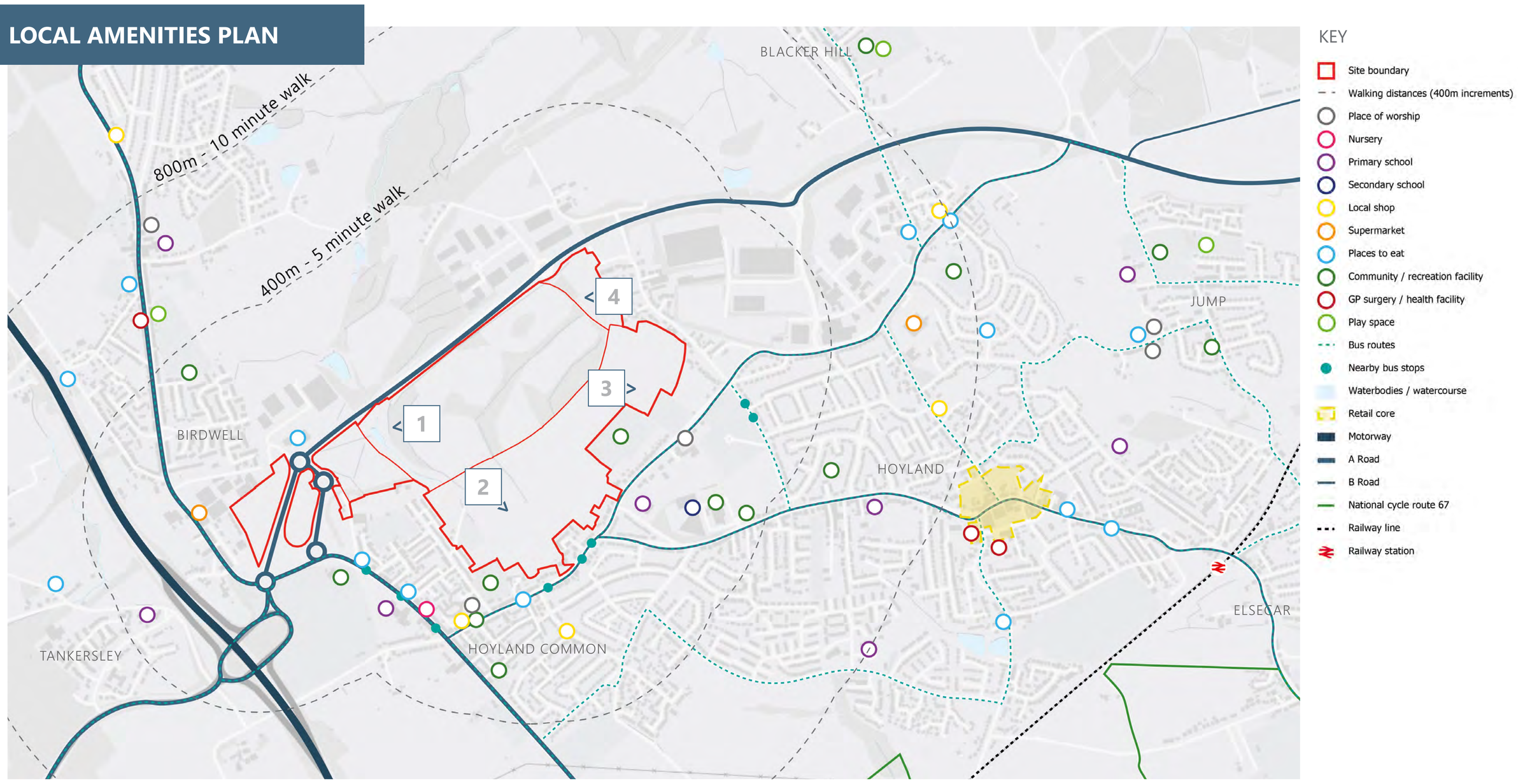
LAND OWNERSHIP



Land Ownership Plan

Local Amenities

LOCAL AMENITIES PLAN



Facilities plan with photo locations

Area of wetland around the existing pond within the western area of the site

Southern views from the public right of way running through the site

Hoyland Lowe Stand

Views north from the north eastern edge of the site boundary

LOCAL AMENITIES

Shops, Services and Facilities Future residents and employees will be able to access shops, services and facilities in Hoyland Common, Hoyland Town Centre, Birdwell, Tankersley and Blacker Hill. The majority of the offerings are within 2km of the site which means that people will be able to travel on foot subject to good footpath connections being provided.

Hoyland Town Centre offers a range of shops as well as general and second hand markets on Tuesdays, Thursdays and Saturdays.

Leisure The site is located within walking distance of Hoyland Leisure Centre and Kirk Balk Academy. The centres offer a range of facilities which include swimming, gymnasium and court hire.

PUBLIC TRANSPORT

Buses There are frequent bus services operating from various bus stops surrounding the site. These are within walking distance and offer services to Barnsley Town Centre (via Birdwell), Hoyland Town Centre, Chapeltown, Elsecar, Broomhill and Manvers (via Cortonwood).

Trains Elsecar Train Station is located approximately 2.3km east of the site. Trains operate half hourly between Leeds (via Barnsley) and Nottingham (via Sheffield) Monday to Saturday with a reduced service on Sunday. This allows people to travel to and from the site via train as part of a combined journey.

LOCAL INFRASTRUCTURE

Infrastructure Delivery Plan Infrastructure issues have been considered throughout the Local Plan process. The council engaged with relevant infrastructure providers during the production of the Infrastructure Delivery Plan (IDP) which supports the Local Plan. This can be found in the Local Plan Examination library.

Barnsley council's Local Plan Policy I1 'Infrastructure and Planning Obligations' states that development must be supported by appropriate physical, social, economic and communications infrastructure. New development should not overburden existing infrastructure. Where new development creates a need for new or improved infrastructure, developer contributions will be sought to make the development acceptable in planning terms.

Healthcare Barnsley Council are working with Barnsley Clinical Commissioning Group (CCG) to develop a strategy to ensure that services can evolve to meet the needs of existing communities and population growth associated with new housing development.

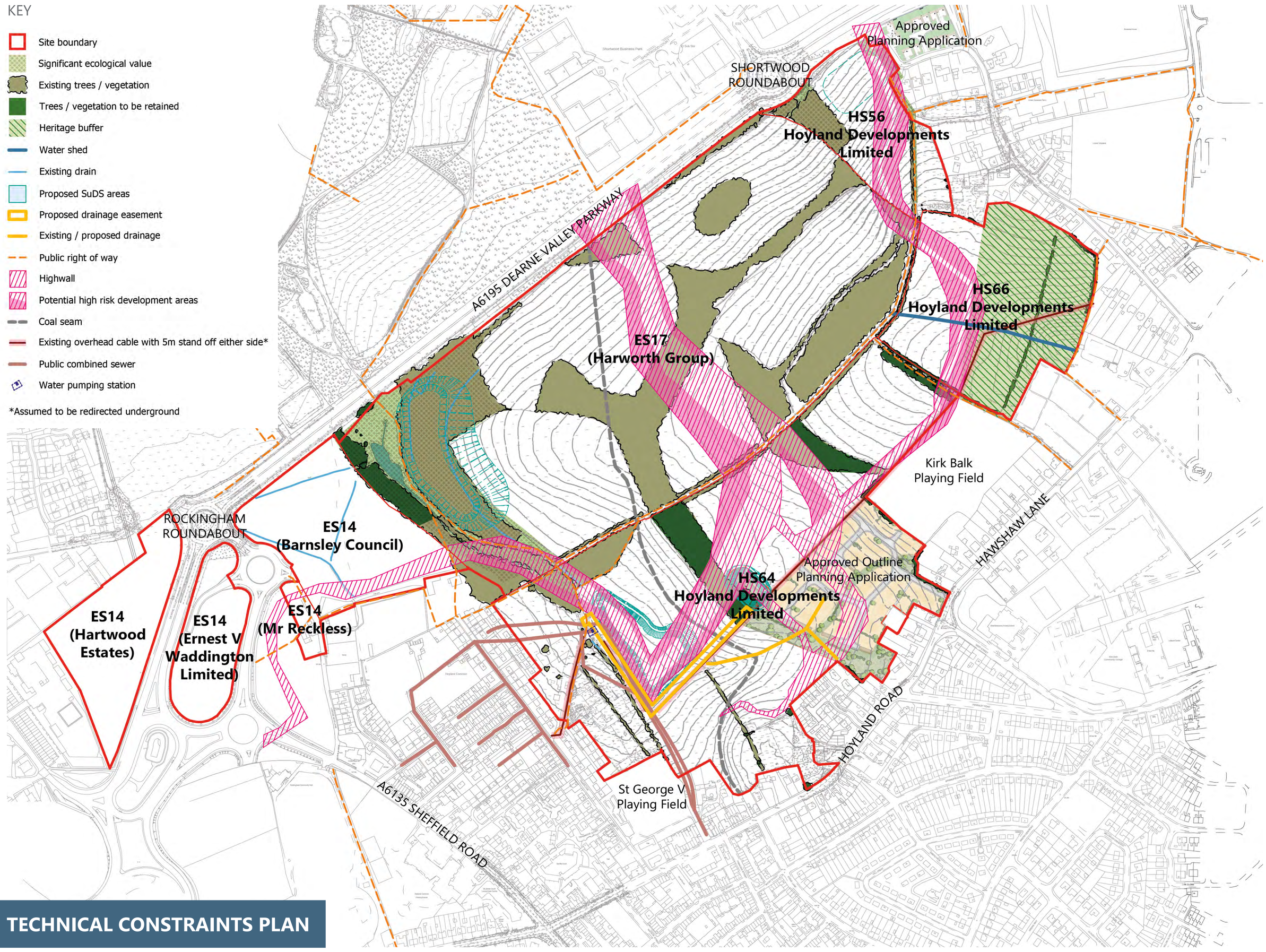
South Yorkshire Ambulance Service confirmed through the Infrastructure Delivery Plan that the geographical coverage of existing services is adequate for the level of planned growth.

Policing During the preparation of the Infrastructure Delivery Plan (IDP) South Yorkshire Police confirmed that there were no issues with current provision and non-envisaged in the foreseeable future.

Fire and Rescue South Yorkshire Fire and Rescue confirmed through the Infrastructure Delivery Plan that they were reviewing service provision within the borough and that it would consider the needs of the existing communities as well as planned growth for the next 15 years.

Schools Barnsley Council as a local authority has a statutory obligation to provide primary and secondary school places for pupils within the borough. The Local Plan identified land for new schools where there it was demonstrated that demand arising from new development could not be accommodated within existing schools. A new school site was not identified in Hoyland through the Local Plan process. Barnsley Council's Education Department are working with colleagues in Assets and Planning Policy to assess the short, mid and long term impact on school place planning within the South West School Place Planning Area. Where evidence demonstrates that pupil numbers will exceed the capacity of existing schools, there are a number of options available to the authority. This could include reviewing existing schools to identify opportunities for expansion, managing the geographical distribution of pupils through the admissions procedure, or identifying a site for the delivery of a new school. Barnsley Council will monitor projections closely and take action where necessary.

Technical Considerations



TECHNICAL CONSTRAINTS PLAN

Ground contamination and land stability Deep underground mining at the site (at depths of between 60-440m) ceased in 1977, meaning the ground should be stable enough to accommodate new development.

A large area of the site has been subject to open cast mining which took place in the 1950's and 1970's and was known as the Hoyland Common and Rockingham Open Cast Sites. When the site was backfilled (new material imported to replace the coal that had been removed) it was not compacted to create development platforms. JPG are currently exploring engineering solutions to make sure that all new development does not suffer from differential settlement (subsidence). The pink areas identified on the Technical Constraints Plan (above) show areas of highwall (where backfilled ground meets untouched ground). This may limit the level of development at these locations however JPG are working to identify suitable engineering solutions that would allow us to maximise the overall amount of land available for development.

Biodiversity As part of the Local Plan process the site has been subject to ecological surveys to identify areas of significant value. The majority of the site is considered to be low value habitat for wildlife as it is farming land, broad leaf plantation woodland, semi-improved grassland and scrub. The largest area of significant ecological value is to the west of ES17 which includes an existing pond, swamp, semi-improved grassland, trees and scattered scrub. Other smaller areas of trees and hedgerows are also considered to be of significant ecological value. The Masterplan Framework will seek to retain areas of significant ecological value as far as possible. The Masterplan Framework will deliver a net biodiversity gain (improve on the current situation), this may be achieved through a combination of on-site and off-site compensation measures that will be agreed with Barnsley Council's Biodiversity Officer. This could include improvements to nearby Local Wildlife Sites.

At the planning application stage developers will provide protected species surveys which set out any mitigation measures required to protect species such as Great Crested Newts, reptiles, bats, breeding birds and water voles.

The nearest protected trees are located on Hawshaw Lane, outside the Masterplan Framework.

Landscape Character As part of the Local Plan process a Local Character Assessment (LCA) was prepared. The Masterplan Framework area sits within 'E4 – Hoyland Settled Woodland Farmland'. The character of this area is defined by complex relationships between previous industrial activity (mining), urban settlement, arable farmland and woodland. The assessment concludes that the Masterplan Framework area has the potential to deliver new development with relatively limited harm on the landscape character as it is already quite urbanised. The assessment recommends that the layout of new development should incorporate landscape features to partially screen development from the Dearne Valley Parkway (A6195) and wider area.

Heritage There are no designated heritage assets within the Masterplan Framework area and it does not lie within a conservation area. The nearest heritage assets are Hoyland Lowe Stand (Grade II Listed Building) and St Peters Church (Grade II Listed Building), both lie beyond the south-eastern boundary of the Masterplan Framework area. The Local Plan identifies a 'no development' buffer around Hoyland Lowe Stand (on site HS66, shown in green on the Technical Constraints Plan (above), this will help to protect the historic settling of Hoyland Lowe Stand.

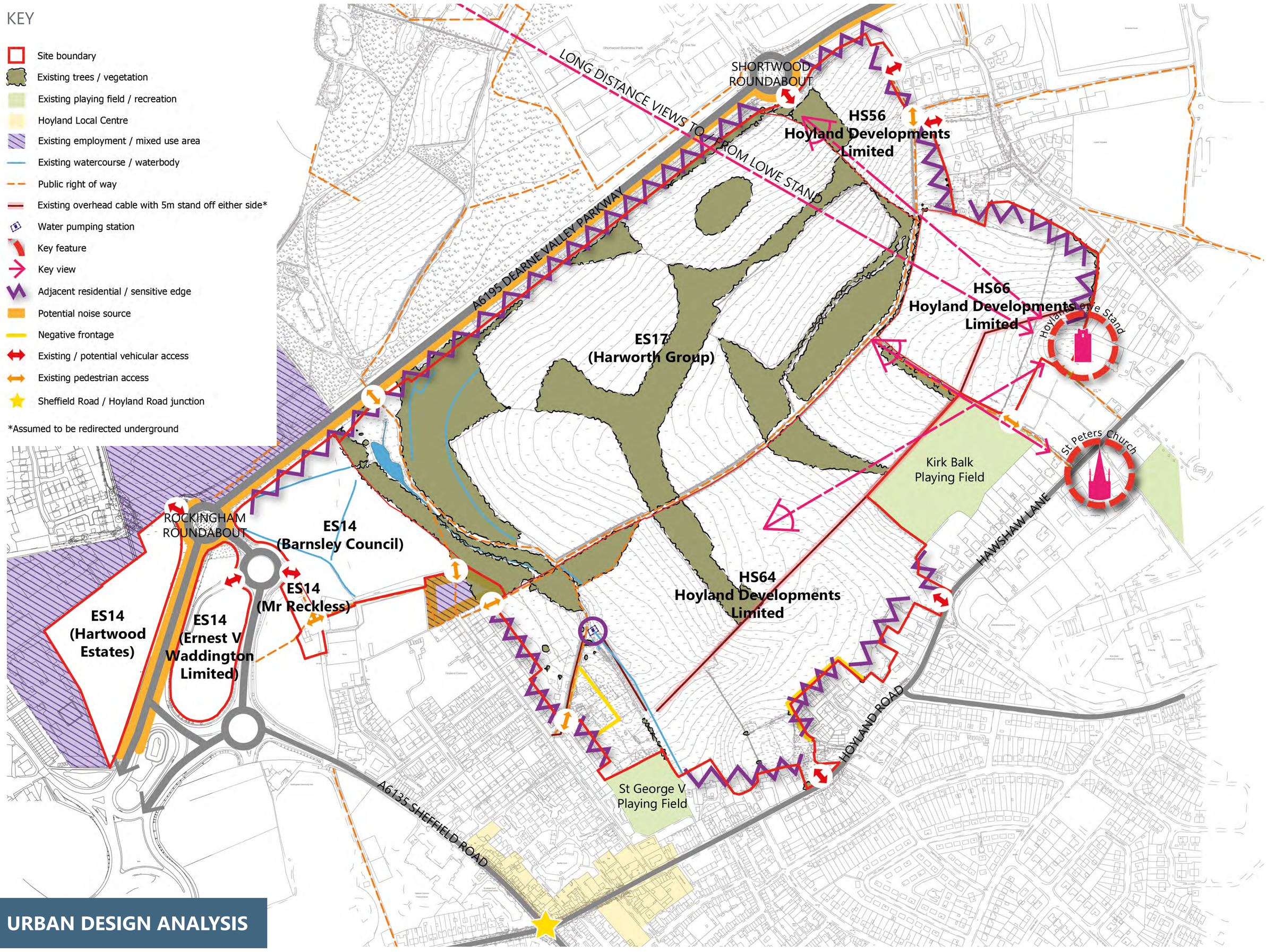
The Masterplan Framework will need to give careful consideration to the design, scale and positioning of new development on HS66 as well as the design and maintenance of new landscaping. The layout of new development should also maximise views of the heritage assets from within the site and the wider area. This will help to contribute towards the character of the new development.

Archaeology The initial evidence suggests that there are no buried archaeological remains of value, this is due to the open cast mining of the site. Where the ground remains undisturbed there may be archaeological, however desktop work suggests that any remains would not be sufficiently significant to prevent future development. At the planning application stage developers will be required to submit an appropriate archaeological investigation, this may include intrusive investigations (trial trenching).

Flood risk and drainage The Masterplan Framework area lies within Flood Zone 1 and is therefore at low risk of flooding from fluvial sources (rivers and streams). All planning applications over 1 hectare will be accompanied by a Flood Risk Assessment, this will be assessed by Barnsley Council and the Environment Agency.

- **Surface Water** Given that the Masterplan Framework area has been subject to opencast and underground mining, it is not recommended that surface water is allowed to soakaway into the ground as this could cause ground stability issues. A Drainage Strategy has been developed for the site and this recommends sustainable drainage systems including detention basins (wet or dry basins which hold water during wet periods). Water would then be released at a controlled rate into a positive discharge point (an existing watercourse). The Sustainable Urban Drainage detention basins (SUDs) are shown on the Technical Constraints Plan (above) and these could serve individual plots or deliver a combined solution for all new development.
- **Foul Water** There is a 375mm diameter public combined sewer in Hoyland Road and it is envisaged that the residential development could discharge into this network. There is currently a pumping station within the Masterplan Framework area (HS64) and due to site levels it may be necessary to direct foul water via the pumping station. Further consideration is being given to the foul water strategy for the new employment development.

Design Considerations



URBAN DESIGN ANALYSIS

Movement and transport

- **Access** There is potential for a range of access points into the residential and employment areas. A key aim of the Transport Strategy is to direct traffic away from Hoyland Common, particularly the crossroad junction on Sheffield Road. Traffic modelling suggests that the existing highway network can accommodate 250 new homes on HS64 before a new access is required from the Dearne Valley parkway (A6195). This consultation seeks views on three potential access options, these are as follows:
  - **Option A** Main access from Rockingham Roundabout
  - **Option B** Main access from Shortwood Roundabout
  - **Option C** Main access off a new roundabout on the Dearne Valley Parkway (A6195)

  (all options will show access to the northern part of ES17 and HS56 from Shortwood Roundabout)
- **Street Hierarchy** The street hierarchy looks to provide a series of linked routes designed to reflect expected traffic levels. In prioritising streets (principle means of access, secondary and tertiary streets) the developments will create high quality, safe and convenient routes for motorists, cyclists and pedestrians. Pedestrian and cycle routes will be linked into the existing network where possible to encourage trips on foot and on bicycle. The Masterplan Framework will also incorporate existing public rights of way however these may be redirected to create convenient routes through the new development.
- **Public Transport** Barnsley Bus Partnership will be consulted throughout the development of the Masterplan Framework to establish whether the route of existing bus services can be diverted through the site. It is envisaged that direct, safe and attractive walking routes to bus stops will be provided to encourage use of public transport for residents, employees and visitors.
- At the planning applications stage developers will be required to submit Travel Plans which set out how sustainable travel measures will be implemented, monitored and reviewed over an agreed period.

Neighbouring properties and uses

The Masterplan Framework will consider the amenity of existing and future residents. All future planning applications will need to demonstrate adequate separation distances and appropriate boundary treatment to prevent loss of privacy. Planning applications for employment development will need to demonstrate that there would not be an adverse impact upon the amenity of existing and future residents. New employment development should be sensitively designed and new homes could incorporate mitigation measures to guard against nuisance. This approach will allow residential and employment development to be delivered on neighbouring sites.

Placemaking

A key principle of the Masterplan Framework is incorporating design measures to create a sense of place and distinctive build environment. There is an opportunity to create entrances into the Masterplan Framework area which create a sense of arrival and become local landmarks. This could be achieved through the arrangement of buildings and positioning of hard and soft landscaping. The objective is to deliver distinguishable and recognisable places to give residents, employees and visitors a positive experience.

The Masterplan Framework will deliver housing at different densities (35-55 dwellings per hectare) and this will create a series of residential areas that vary in character. Due to the topography (levels) of the site it is envisaged that the employment units will be set at a lower level than the new residential properties.

Greenspace and recreation facilities

The Masterplan Framework will include a series of open spaces including formal recreation facilities (potentially a cricket facility with pavilion and associated infrastructure), areas for children's play and informal open space.

- **Formal recreation facilities** Barnsley Council is reviewing formal sports facilities across the whole of Hoyland given that large scale growth is also proposed to the west and south of the area. The outcome of this review will become clearer as masterplan frameworks are prepared for the areas to the south and west of Hoyland, during which the future of Rockingham Sports Ground will be considered. This could result in relocation of that facility or investment in the existing ground. Regardless of this, there is an identified need for an additional cricket pitch with multiple wickets in the Hoyland area so each of the masterplan options show a proposed cricket facility, including a multi-use pavilion, practice nets and car parking. This would be at the heart of the new housing development.
- **Children's play facilities** It is envisaged that within the Masterplan Framework area there will be a range of children's play facilities. This could include a Local Area of Play (LAP – for younger children aged 4-6 years old) and Local Equipped Area for Play (LEAP – suitable for all ages) or Neighbourhood Equipped Area of Play (NEAP – suitable for all ages but includes a Multi-Use Games Area (MUGA)). It is acknowledged that there may be an opportunity to improve existing facilities at King George V Playing Field off Tinker Lane.
- **Informal open space** A series of informal open spaces will be created throughout the Masterplan Framework area, this will be a combination of the following:
  - Retained areas of significant ecological value
  - Constrained land which is more difficult to build on (highwall zones)
  - A minimum of 15 percent of the gross site area from all new housing development sites
  - Drainage detention basins will also provide areas of greenspace which would fill with surface water during wet periods
  - Public rights of way (which could include cycle and pedestrian routes)
  - Landscape buffers

  These spaces will offer a range of benefits including:
  - Help to soften the appearance of new development
  - Reduce the visual impact of the development from the wider area
  - Create placemaking focal points
  - Create habitats for wildlife
  - Provide attractive walking and cycling linkages throughout the site
  - Provide a green buffer between the residential and employment development

Design Considerations

Utilities and services A Utility Report is currently being prepared, this identifies existing utility infrastructure (water, gas, electricity, broadband) and the potential opportunities and constraints associated with the existing provision. The report will estimate the service load requirements from the new development and this will help to identify where infrastructure improvements/upgrades are required. Initial findings suggests that the following works are required:

- **Water** - 3km mains water pipe
- **Electricity** - Capacity is available at Elsecar and Worsbrough Park Primary Sub-Stations. The 11kV boards and connections to the Masterplan Framework area would need to be upgraded.

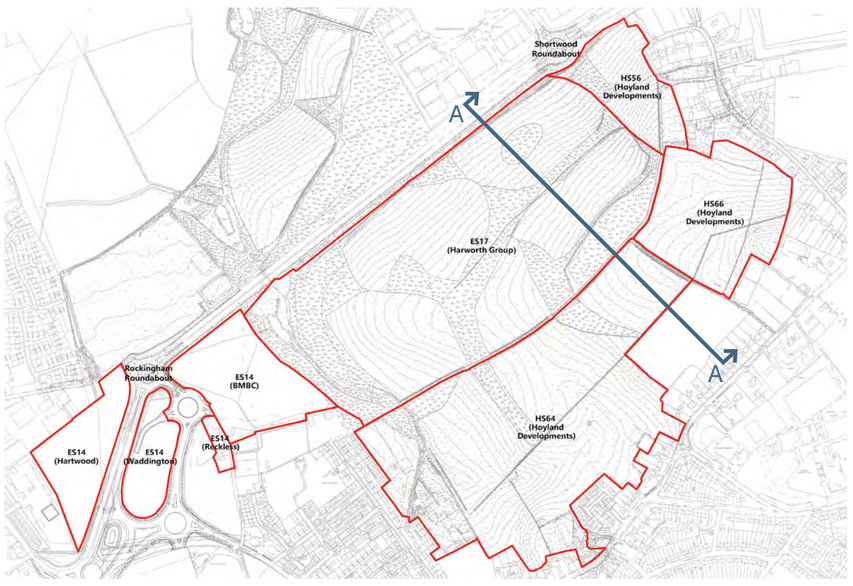
The Utility Report will confirm when these upgrades are required in line with the phasing of new development.

Health and well-being Establishing a series of guiding health and well-being principles is fundamental to the Masterplan Framework, this will help to ensure that proposals create a strong, healthy and just society for existing and future residents as well as employees. A Health Impact Assessment (HIA) is being developed as part of the Masterplan Framework process, this will include key themes in the Sport England Active Design Principles. The three pillars of health and well-being will also be followed:

- **Health improvement considerations** – to increase physical and mental well-being. The Masterplan Framework will include initiatives to encourage walking and cycling, deliver greenspaces, promote social interaction and employment
- **Health protection considerations** – as part of the technical assessment work careful consideration needs to be given to reducing the negative impacts relating to air, noise, water and ground pollution
- **Health infrastructure considerations** – as mentioned, the CCG will ensure that services are being commissioned and delivered to meet the needs of the local population

Sustainability and energy usage In line with Local Plan policy, the Masterplan Framework aims to reduce the impact on climate change. Sustainability and energy usage will be a principle consideration when developing the Masterplan Framework with detailed measures being outlined at the planning application stage. Key considerations would include:

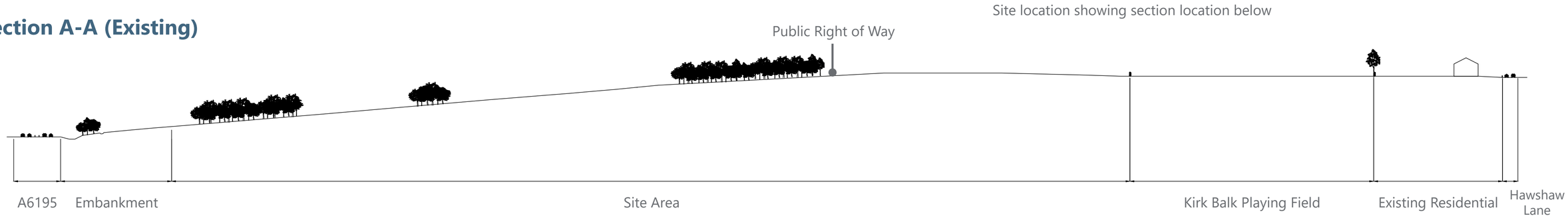
- The feasibility of renewable and low carbon energy (solar panels, wind turbines)
- Encourage convenient and integrated access by public transport, cycle and on foot
- Efficient use of natural resources such as grey water recycling (reusing waste water from buildings)
- Protection or enhancement of the quality of natural assets including water and biodiversity
- Creating high quality, well designed development taking into account local distinctiveness
- Improved quality of local landscapes and protection of the character of the wider countryside
- Preservation or enhancement of the historic and cultural features of acknowledged importance



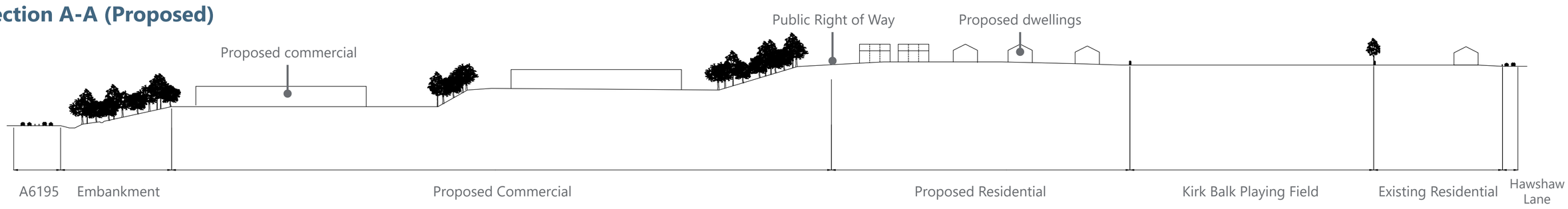
Site location showing section location below

SECTIONS

Section A-A (Existing)



Section A-A (Proposed)



SITE PHOTOS

A bird's eye view of the site from the west

View towards Dearne Valley Parkway showing under pass with public right of way

Looking east from Rockingham Roundabout

Design Proposals

Following careful consideration of the Local Plan requirements, technical constraints and key principles for creating a Masterplan Framework, three high level concept layouts have been developed. These options show how the Masterplan Framework area could deliver employment uses, new homes, appropriate access, open space, biodiversity enhancements, landscape buffers and drainage solutions whilst taking into consideration place-making principles.

The key differences between the three options are as follows:

- Option A – Main access from Rockingham Roundabout (with access to the northern part of ES17 and HS56 from Shortwood Roundabout)
- Option B – Main access from Shortwood Roundabout
- Option C – Main access off a new roundabout on the Dearne Valley Parkway (A6195)

OPTION A

Main access from Rockingham Roundabout (with access to the northern part of ES17 and HS56 from Shortwood Roundabout)

Advantages

- Reduces traffic around Hoyland Common, particularly at the crossroad junction on Sheffield Road
- New link road utilises an existing roundabout spur
- New link road would be delivered on Barnsley Council owned land (ES14) therefore maximising the developable area of other sites in the Masterplan Framework area
- Provides a direct link from Junction 36 of the M1 motorway which would be attractive to potential occupiers of the residential and employment units
- Improved cycle and footpath links connecting Hoyland Common and existing employment units at Gateway 36
- Introducing an access off Shortwood Roundabout would allow delivery of employment uses on the northern part of ES17 in the short term

Disadvantages

- New link road would cross an area identified as having significant ecological value
- The structure required to cross the area of significant ecological value and watercourse would require significant investment
- Would require the diversion of existing public rights of way
- Will require high quality cycle and pedestrian links to the northern part of employment site ES17 as no direct vehicle access from the southern parcel of ES17 or Hoyland Common through the new housing development
- Further investigation work is required to fully understand the design and risks associated with constructing a new link road over an area of highwall
- As the new link road would not serve the entire Masterplan Framework area there would be additional costs associated with providing a secondary access off Shortwood Roundabout

KEY

- Site boundary
- Residential parcels
  - Low density
  - Medium density
  - High density
- Commercial parcels
- Spine / primary road
- Traffic calming feature
- Shared surface street
- Private drive
- Public open space
- Pedestrian / cycle route
- Retained trees / vegetation
- Proposed trees / vegetation
- Proposed appropriate landscape buffer
- Indicative SuDS ponds
- Opportunity for landmark building

OPTION A

Design Proposals

OPTION B

Main access from Shortwood Roundabout (with access to the northern part of ES17 and HS56 from Shortwood Roundabout)

Advantages

- Reduces traffic around Hoyland Common, particularly at the crossroad junction on Sheffield Road
- New road you utilise an existing roundabout spur on Shortwood Roundabout
- Retention of an area identified as having significant ecological value (west of ES17)
- Avoid diversion of existing public rights of way (west of ES17)
- Opportunity to maximise views of Hoyland Lowe Stand from the new road off Shortwood Roundabout
- Improved cycle and footpath links to the west of the site
- Ability to deliver all employment development on ES17 in the short term

Disadvantages

- New road design will require significant investment due to the earthworks and engineering solutions needed to address the change in levels from Shortwood Roundabout
- Formation of development platforms as the new link road sweeps up the landscape, this may result in some loss of efficiency
- Due to the levels, the new link road will run up the slope of the site at a lower level than the residential platforms. This may create placemaking challenges and reduce opportunities for new homes to face directly onto the street
- Will require high quality pedestrian and cycle links to the west of the Masterplan Framework area linking with Gateway 36 as no vehicular access is proposed

Design Proposals

OPTION C

Main access off a new roundabout on the Dearne Valley Parkway (A6195) (with access to the northern part of ES17 and HS56 from Shortwood Roundabout)

Advantages

- Creation of a new roundabout on the Dearne Valley Parkway between Rockingham Roundabout and Shortwood Roundabout
- Reduces traffic around Hoyland Common, particularly at the crossroad junction on Sheffield Road
- Retention of areas identified as having significant ecological value (west of ES17 and south of Shortwood Roundabout)
- Avoid diversion of existing Public Rights of Way (west of ES17)
- A central road through employment site ES17 would improve both its commercial profile and accessibility

Disadvantages

- Significant costs associated with the creation of a new roundabout
- New road design will require significant investment due to the earthworks and engineering solutions needed to address the change in levels
- The formation of development platforms on employment site ES17 may result in some loss of efficiencies
- As the new road serving the residential areas would run through employment site ES17, this may create placemaking challenges, particularly in terms of creating an attractive gateway entrance into the new residential area from the Dearne Valley Parkway

Next Steps

The Masterplan Framework will continue to evolve, incorporating technical work as it becomes available. The public consultation is an opportunity for key stakeholders and the local community to provide important feedback on the Masterplan Framework themes and to help shape the final document.

TIMESCALES

The proposed timescales are as follows:

- **August to September 2019 – Public consultation**
- **September to October 2019 – Review public consultation feedback**
- **November 2019 – Develop the final version of the Masterplan Framework**
- **December 2019 – Adoption of the Masterplan Framework by Barnsley Council**

Planning Strategy The Local Plan sets out that Masterplan Frameworks should be adopted prior to the determination of any planning applications on the affected sites.

Barnsley Council has acknowledged that less strategic proposals could come forward in the short term, however developers are required to demonstrate that the proposal is unlikely to prejudice the overall Masterplan Framework objectives, particularly with regard to technical, environmental and place-making issues. Due weight will also be given the previous historic planning decisions that have already been approved. A number of sites within the Masterplan Framework area already have planning consents:

Site Allocation Reference	Ownership / Control	Planning Application Reference	Proposal
ES14	Waddington	2018/0745	Erection of A3 Café and drive-thru facility
ES17	Hoyland Developments Limited	2016/1531	Outline consent for 100 dwellings

Each future planning application will be determined on its own merits and considered on a case by case basis.

HOW TO ENGAGE

- Fill in the questionnaire on WYG's website: **www.wyg.com/hoyland-north**
- Download the questionnaire from WYG's website and email to **public.consultation@wyg.com**
- Download the questionnaire from WYG's website and post to **WYG, Rowe House, 10 East Parade, Harrogate, HG1 5LT**
- Hard copies of the questionnaire are available at our exhibition events, **Hoyland Library** (High Croft, Hoyland, S74 9AF) and the **Library @ The Lightbox** in Barnsley Town Centre

The information you provide will only be used for the purposes of this consultation exercise. All feedback will be considered and changes to the proposals will be made where possible and appropriate. The final Masterplan Framework will need to be approved by Full Council before adoption. The data you have submitted will be held securely by WYG in accordance with General Data Protection Regulation (GDPR).

DESIGN EXAMPLES

Play space within open space, overlooked by homes

Cricket pitch, overlooked by dwellings

A traffic calming / road feature to aid pedestrians / cyclists

Commercial built form buffered by planting

Thank you for taking the time to let us know your thoughts on the Hoyland North Masterplan Framework.

9. Air Quality Assessment

Harworth Group

Rockingham Phase 2 & 3

Air Quality Assessment

January 2020

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Project:	Rockingham Phase 2
Client:	Harworth Group
Job Number:	A115145
File Origin:	O:\Acoustics Air Quality and Noise\Active Projects

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Issue	Date	Status
1	13th December 2019	First Issue
2	13th January 2020	Second Issue – Updated Air Quality Baseline

Contents Page

1. Introduction 2
1.1 Site Location and Context 2
2. Policy and Legislative Context 3
2.1 Documents Consulted 3
2.2 Air Quality Legislative Framework 4
2.3 Planning and Policy Guidance 6
3. Assessment Methodology 9
3.1 Determining the Impact Magnitude of the Air Quality Effects 9
4. Baseline Conditions 11
4.1 Air Quality Review 11
4.2 Meteorology 13
4.3 Emission Sources 13
4.4 Sensitive Receptors 13
4.5 Ecological Receptors 14
5. Assessment of Air Quality Impacts - Construction Phase 16
5.1 Pollutant Sources 16
5.2 Particulate Matter (PM_{10}) 16
5.3 Dust 16
5.4 Methodology 17
5.5 Assessment Results 17
6. Assessment of Air Quality Impacts - Operational Phase 19
6.1 Existing and Predicted Traffic Flows 19
6.2 Background Concentrations 20
6.3 Model Verification 23
6.4 Summary of Model Inputs 24
6.5 ADMS Modelling Results 25
7. Mitigation 31
7.1 Construction Phase 31
7.2 Operational Phase Mitigation - BMBC Air Quality and Emissions Good Practice Planning Guidance 32
8. Conclusions 34

Figures

Figure 1 Air Quality Assessment Area
Figure 2 Emley Moor No.2 2018 Meteorological Station Wind Rose

Appendices

Appendix A Construction Phase Assessment Methodology
Appendix B Alternative (CURED) Future Emissions Scenario Results
Appendix C Report Terms and Conditions

Executive Summary

WYG has undertaken an Air Quality Assessment to support an application for a proposed employment development at land to the north and south of the Dearne Valley Parkway (Gateway 36 Phases 2 and 3 – Local Plan site references ES17 and ES15).

Construction Phase

The potential effects during the demolition and construction phases include fugitive dust emissions from site activities, such as earthworks, construction and trackout. The impacts during the operational phase take into account exhaust emissions from additional road traffic generated due to the proposed development.

During the construction phase, site specific mitigation measures detailed within this assessment will be implemented. With these mitigation measures in place, the effects from the construction phase are not predicted to be significant.

Operational Phase

An operational year assessment for 2029 traffic emissions has been undertaken to assess the effects of Proposed Development.

The maximum predicted annual average exposure to NO_2, PM_{10} and $PM_{2.5}$ at any proposed residential receptor is below the annual average AQO and therefore no additional mitigation is required.

The assessment of the impact description of the effects associated with the proposed development, with respect to NO_2, PM_{10} and $PM_{2.5}$ exposure, the impact description of the proposed development is determined 'negligible' for all identified existing sensitive receptors. The effect on ecological receptors has been assessed and is determined to be 'negligible'.

1. Introduction

Harworth Group commissioned WYG Environment to prepare an Air Quality Assessment to support an application for a proposed employment development at land to the north and south of the Dearne Valley Parkway (Gateway 36 Phases 2 and 3 – Local Plan site references ES17 and ES15).

The proposed development includes the creation of 1.1 million sqft (102,193sqm) floorspace for employment uses (use classes B1/B2/B8), together with associated infrastructure and landscape works.

This report has been produced to support a hybrid application where detailed planning permission is sought for earthworks and access and outline planning permission sought for the employment development, internal access routes and landscaping and drainage.

1.1 Site Location and Context

The approximate United Kingdom National Grid Reference (NGR) is approximately 435025, 400853. The Site is bounded to the north and south by open farmland, and to the east and west by industrial and residential properties.

Reference should be made to Figure 1 for a map of the proposed development site and surrounding area.

The following assessment stages have been undertaken as part of this assessment:

- Baseline evaluation;
- Assessment of potential air quality impacts during the construction phase;
- Assessment of potential air quality impacts during the operational phase; and,
- Identification of mitigation measures (as required).

The results of the assessment are detailed in the following sections of this report.

The construction phase assessment considers the potential effects of dust and particulate emissions from site activities and materials movement based on a qualitative risk assessment method based on the Institute of Air Quality Management's (IAQM) 'Guidance on the Assessment of Dust from Demolition and Construction' document, published in 2014.

The assessment of the potential air quality impacts that are associated with the operational phase has focused on the predicted impact of changes in ambient nitrogen dioxide (NO_2) and particulate matter with an aerodynamic diameter of less than 10 µm (PM_{10}) and less than 2.5 µm ($PM_{2.5}$) as a result of the development at key local receptor locations. The changes have been referenced to EU air quality limits and UK air quality objectives and the magnitude and significance of the changes have been referenced to non-statutory guidance issued by the IAQM and Environmental Protection UK (EPUK).

2. Policy and Legislative Context

2.1 Documents Consulted

The following documents were consulted during the undertaking of this assessment:

Legislation and Best Practice Guidance

- National Planning Policy Framework, Ministry for Housing, Communities and Local Government, Revised February 2019;
- Planning Practice Guidance: Air Quality, Ministry for Housing, Communities and Local Government, November 2019;
- The Air Quality Standards Regulations (Amendments), 2016;
- The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, 2007;
- The Environment Act, 1995;
- Local Air Quality Management Technical Guidance LAQM.TG16, Defra, 2018;
- Design Manual for Roads and Bridges, Volume 11, Section 3, Part 1, LA 105 Air quality, November 2019;
- Guidance on the Assessment of Dust from Demolition and Construction, IAQM, 2014.
- Land-Use Planning & Development Control: Planning for Air Quality, EPUK & IAQM, 2017;
- Guidance on Monitoring in the Vicinity of Demolition and Construction Sites, IAQM, October 2018; and,
- A Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites (Version 1.0), IAQM, June 2019.

Websites Consulted

- Google maps (maps.google.co.uk);
- The UK National Air Quality Archive (www.airquality.co.uk);
- Department for Transport Matrix (www.dft.go.uk/matrix);
- emapsite.com;
- Multi-Agency Geographic Information for the Countryside (http://magic.defra.gov.uk/);
- Planning Practice Guidance (http://planningguidance.planningportal.gov.uk/); and
- Barnsley Metropolitan Borough Council (http://www.barnsley.gov.uk/).

Site Specific Reference Documents

- Barnsley Metropolitan Borough Council, 2018 Air Quality Annual Status Report (Published June 2018);
- Barnsley Metropolitan Borough Council, Air Quality and Emissions Good Practice Planning Guidance (October 2018); and,
- Barnsley Metropolitan Borough Council: Local Plan, Adopted January 2019.

2.2 Air Quality Legislative Framework

European Legislation

European air quality legislation is consolidated under Directive 2008/50/EC, which came into force on 11th June 2008. This Directive consolidates previous legislation which was designed to deal with specific pollutants in a consistent manner and provides new air quality objectives for fine particulates. The consolidated Directives include:

- **Directive 1999/30/EC** – the First Air Quality "Daughter" Directive – sets ambient air limit values for NO_2 and oxides of nitrogen, sulphur dioxide, lead and PM_{10};
- **Directive 2000/69/EC** – the Second Air Quality "Daughter" Directive – sets ambient air limit values for benzene and carbon monoxide; and,
- **Directive 2002/3/EC** – the Third Air Quality "Daughter" Directive – seeks to establish long-term objectives, target values, an alert threshold and an information threshold for concentrations of ozone in ambient air.

The fourth daughter Directive was not included within the consolidation and is described as:

- **Directive 2004/107/EC** – sets health-based limits on polycyclic aromatic hydrocarbons, cadmium, arsenic, nickel and mercury, for which there is a requirement to reduce exposure to as low as reasonably achievable.

UK Legislation

The Air Quality Standards Regulations (Amendments 2016) seek to simplify air quality regulation and provide a new transposition of the Air Quality Framework Directive, First, Second and Third Daughter Directives and also transpose the Fourth Daughter Directive within the UK. The Air Quality Limit Values are transposed into the updated Regulations as Air Quality Standards, with attainment dates in line with the European Directives. SI 2010 No. 1001, Part 7 Regulation 31 extends powers, under Section 85(5) of the Environment Act (1995), for the Secretary of State to give directions to Local Authorities (LAs) for the implementation of these Directives.

The UK Air Quality Strategy is the method for implementation of the air quality limit values in England, Scotland, Wales and Northern Ireland and provides a framework for improving air quality and protecting human health from the effects of pollution.

For each nominated pollutant, the Air Quality Strategy sets clear, measurable, outdoor air quality standards and target dates by which these must be achieved; the combined standard and target date is referred to as the Air Quality Objective (AQO) for that pollutant. Adopted national standards are based on the recommendations of the Expert Panel on Air Quality Standards (EPAQS) and have been translated into a set of Statutory Objectives within the Air Quality (England) Regulations (2000) SI 928, and subsequent amendments.

The AQOs for pollutants included within the Air Quality Strategy and assessed as part of the scope of this report are presented in Table 2.1 and Table 2.2 long with European Commission (EC) Directive Limits and World Health Organisation (WHO) Guidelines.

Table 2.1 Human Health Air Quality Standards, Objectives, Limit and Target Values

Pollutant	Applies	Objective	Concentration Measured as[10]	Date to be achieved and maintained thereafter	European Obligations	Date to be achieved and maintained thereafter	New or existing
PM_{10}	UK	50µg/m^3 by end of 2004 (max 35 exceedances a year)	24-hour Mean	1st January 2005	50µg/m^3 by end of 2004 (max 35 exceedances a year)	1st January 2005	Retain Existing
	UK	40µg/m^3 by end of 2004	Annual Mean	1st January 2005	40µg/m^3	1st January 2005	
$PM_{2.5}$	UK	25µg/m^3	Annual Mean	31st December 2010	25µg/m^3	1st January 2010	Retain Existing
NO_2	UK	200µg/m^3 not to be exceeded more than 18 times a year	1-Hour Mean	31st December 2005	200µg/m^3 not to be exceeded more than 18 times a year	1st January 2010	Retain Existing
	UK	40µg/m^3	Annual Mean	31st December 2005	40µg/m^3	1st January 2010	

Table 2.2 Ecological Air Quality Standards, Objectives, Limit and Target Values

Pollutant	Applies	Objective	Concentration Measured as[10]
NO_X	UK	30µg/m^3	Annual Mean

Within the context of this assessment, the annual mean objectives are those against which facades of residential receptors will be assessed and the short-term objectives apply to all other receptor locations, where people may be exposed over a short duration, both residential and non-residential such as using gardens, balconies, walking along streets, using playgrounds, footpaths or external areas of employment uses.

Local Air Quality Management

Under Section 82 of the Environment Act (1995) (Part IV) Local Authorities (LAs) are required to periodically review and assess air quality within their area of jurisdiction under the system of Local Air Quality Management (LAQM). This review and assessment of air quality involves assessing present and likely future air quality against the AQOs. If it is predicted that levels at the façade of buildings where members of the public are regularly present (normally residential properties) are likely to be exceeded, the LA is required to declare an Air Quality Management Area (AQMA). For each AQMA, the LA is required to produce an Air Quality Action Plan (AQAP), the objective of which is to reduce pollutant concentrations in pursuit of the AQOs.

2.3 Planning and Policy Guidance

National Policy

The National Planning Policy Framework (NPPF), revised February 2019, principally brings together and summarises the suite of Planning Policy Statements (PPS) and Planning Policy Guidance (PPG) which previously guided planning policy making. The NPPF states that:

> *'Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas or Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic or travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan'*

The Planning Practice Guidance (PPG) web-based resource was updated by the Ministry for Housing, Communities and Local Government (MHCLG) on 1st November 2019 to support the National Planning Policy Framework and make it more accessible. A review of PPG: Air Quality identified the following guidance (Paragraph: 001 Reference ID: 32-001-20191101):

> *"The 2008 Ambient Air Quality Directive sets legally binding limits for concentrations in outdoor air of major air pollutants that affect public health such as particulate matter (PM_{10} and $PM_{2.5}$) and nitrogen dioxide (NO_2).*
>
> *The UK also has national emission reduction commitments for overall UK emissions of 5 damaging air pollutants:*
>
> - *fine particulate matter ($PM_{2.5}$)*

- *ammonia (NH_3)*
- *nitrogen oxides (NO_x)*
- *sulphur dioxide (SO_2)*
- *non-methane volatile organic compounds (NMVOCs)*

As well as having direct effects on public health, habitats and biodiversity, these pollutants can combine in the atmosphere to form ozone, a harmful air pollutant (and potent greenhouse gas) which can be transported great distances by weather systems. Odour and dust can also be a planning concern, for example, because of the effect on local amenity."

Local Policy

The Barnsley Metropolitan Borough Council (BMBC) Local Plan (adopted in January 2019) sets out and provided guidance for managing development and land use within the borough. Following a review of the BMBC Local Plan, the following policies have been identified:

"***Policy T5 Reducing the Impact of Road Travel***

We will reduce the impact of road travel by:

- *Developing and implementing robust, evidence based air quality action plans to improve air quality;*
- *Working with our sub regional partners, fleet and freight operators to improve the efficiency of vehicles and goods delivery, and reduce exhaust emissions; and*
- *Implementing measures to ensure the current road system is used efficiently."*

"***Policy CL1 Contaminated and Unstable Land***

Where the future users or occupiers of a development would be affected by contamination or stability issues, or where contamination may present a risk to the water environment, proposals must be accompanied by a report which:

- *shows that investigations have been carried out to work out the nature and extent of contamination or stability issues and the possible effect it may have on the development and its future users, the natural and historic environment; and*
- *sets out detailed measures to allow the development to go ahead safely, including, as appropriate:*
    - *removing the contamination;*
    - *treating the contamination;*
    - *protecting or separating the development from the effects of the contamination; and*

- *addressing land stability issues resulting from former coal mining activities.*

Where measures are needed to allow the development to go ahead safely, these will be required as a condition of any planning permission."

*"**Policy Poll1 Pollution Control and Protection***

Development will be expected to demonstrate that it is not likely to result, directly or indirectly, in an increase in air, surface water and groundwater, noise, smell, dust, vibration, light or other pollution which would unacceptably affect or cause a nuisance to the natural and built environment or to people.

We will not allow development of new housing or other environmentally sensitive development where existing air pollution, noise, smell, dust, vibration, light or other pollution levels are unacceptable and there is no reasonable prospect that these can be mitigated against.

Developers will be expected to minimise the effects of any possible pollution and provide mitigation measures where appropriate."

*"**Policy AQ1 Development in Air Quality Management Areas***

Development which impacts on areas sensitive to air pollution(13)in air quality management areas will be expected to demonstrate that it will not have a harmful effect on the health or living conditions of any future users of the development in terms of air quality (including residents, employees, visitors and customers), taking into account any suitable and proportionate mitigation required for the development.

We will only allow residential development which impacts on areas sensitive to air pollution, where the developer provides an assessment that shows living conditions will be acceptable for future residents, subject to any required mitigation.

We will only allow development which impacts on areas sensitive to air pollution which could cause more air pollution, where the developer provides an assessment that shows there will not be a significantly harmful effect on air quality, subject to any required mitigation.

Furthermore, development which impacts on areas sensitive to air pollution due to traffic emissions will be expected to demonstrate suitable and proportionate mitigation relative to the increased traffic emissions generated by the development."

3. Assessment Methodology

The potential environmental effects of the operational phase of the proposed development are identified as far as current knowledge of the site and development allows. The impact description of potential environmental effects is assessed according to the latest guidance produced by EPUK and IAQM in January 2017 '*Land-Use Planning & Development Control: Planning for Air Quality*' and June 2019 '*A Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites*'.

The methodology used to determine the potential air quality effects of the construction phase of the proposed development has been derived from the IAQM '*Guidance on the Assessment of the Impacts of Dust from Demolition and Construction'* document and is summarised in Section 5.

3.1 Determining the Impact Magnitude of the Air Quality Effects

The impact magnitude of the effects during the operational phase of the development is based on the latest guidance produced by EPUK and IAQM in January 2017. The guidance provides a basis for a consistent approach that could be used by all parties associated with the planning process to professionally judge the overall impact description of the air quality effects based on severity of air quality impacts.

The following rationale is used in determining the severity of the air quality effects at individual receptors:

1. The change in concentration of air pollutants, air quality effects, are quantified and evaluated in the context of AQOs. The impacts are provided as a percentage of the Air Quality Objective (AQO), which may be an EU limit or target value, or an Environment Agency 'Environmental Assessment Level (EAL)';
2. The absolute concentrations are also considered in terms of the AQO and are divided into categories for long term concentration. The categories are based on the sensitivity of the individual receptor in terms of harm potential. The degree of harm potential to change increases as absolute concentrations are close to or above the AQO;
3. Severity of the effect is described as qualitative descriptors; negligible, slight, moderate or substantial, by taking into account in combination the harm potential and air quality effect. This means that a small increase at a receptor which is already close to or above the AQO will have higher severity compared to a relatively large change at a receptor which is significantly below the AQO;
4. The impacts can be adverse when pollutant concentrations increase or beneficial when concentration decrease as a result of development;
5. The judgement of overall impact description of the effects is then based on severity of effects on all the individual receptors considered; and,

6. Where a development is not resulting in any change in emissions itself, the impact description of effect is based on the effect of surrounding sources on new residents or users of the development, i.e., will they be exposed to levels above the AQO.

Table 3.1 Impact Descriptors for Individual Receptors

Long term average concentration at receptor in assessment year	% Change in concentration relative to AQO			
	1	2-5	6-10	>10
≤75% of AQO	Negligible	Negligible	Slight	Moderate
76-94% of AQO	Negligible	Slight	Moderate	Moderate
95-102% of AQO	Slight	Moderate	Moderate	Substantial
103-109 of AQO	Moderate	Moderate	Substantial	Substantial
≥110 of AQO	Moderate	Substantial	Substantial	Substantial

In accordance with explanation note 2 of Table 6.3 of the EPUK & IAQM guidance, the Table is intended to be used by rounding the change in percentage pollutant concentration to whole numbers, which then makes it clearer which cell the impact falls within. The user is encouraged to treat the numbers with recognition of their likely accuracy and not assume a false level of precision. Changes of 0%, i.e. less than 0.5%, will be described as Negligible.

4. Baseline Conditions

4.1 Air Quality Review

This section provides a review of the existing air quality in the vicinity of the proposed development site in order to provide a benchmark against which to assess potential air quality impacts of the proposed development. Baseline air quality in the vicinity of the proposed development site has been defined from several sources, as described in the following sections.

Local Air Quality Management (LAQM)

As required under section 82 of the Environment Act 1995, BMBC has conducted an ongoing exercise to review and assess air quality within its area of jurisdiction. Due to high pollutant levels of NO_2, BMBC has designated six Air Quality Management Area (AQMA) within the borough which are listed below:

- Barnsley AQMA No. 1: An area along the M1 between Junction 35a and Junction 38, including Haigh, Darton, Cawthorne Dike, Higham, Dodworth, Gilroyd, Rockley, Birdwell, and Tankersley. The area extends 100m either side of the central reservation;
- Barnsley AQMA No. 2: An area encompassing the A628 from junction 37 of the M1 to Town End roundabout, including part of Summer Lane from Town End roundabout to Wharncliffe Street;
- Barnsley AQMA No. 4: An area encompassing the southbound carriageway of the A61 Harborough Hill Road from the PC World gyratory to the southbound slip road of the A61 near to its junction with Queens Road;
- Barnsley AQMA No. 5: An area encompassing the junction of Rotherham Road and Burton Road;
- Barnsley AQMA No. 6: Incorporating the A616 road through Langsett; and,
- Barnsley AQMA No. 7: Incorporating the southbound carriageway of the A61 Sheffield Road adjacent to the junction with the A6133 Cemetery Road.

The closest AQMA to the Proposed Development Site is Barnsley AQMA No. 1 which is located 0.7 km west-south-west of the site boundary. As part of the air quality assessment receptors within the AQMA are assessed to determine any effects in air quality as a result of the Proposed Development.

Air Quality Monitoring

Monitoring of air quality within BMBC is undertaken through both continuous and non-continuous monitoring methods. These have been reviewed in order to provide an indication of existing air quality in the area surrounding the proposed development site.

Continuous Monitoring

BMBC operated three automatic monitoring station in 2018. The closest automatic monitoring site, CM1, which is located 4.6 km south-west of the Proposed Development site boundary. The most recently available automatic monitoring data is from 2018, which is presented in Table 4.1.

Table 4.1 Monitored Annual Mean NO_2 Concentrations at Automatic Monitoring Stations

Site ID	Location	Site Type	Distance from Kerb (m)	Inlet Height (m)	2018 Annual Mean NO_2 Concentration (µg/m³)	2018 Annual Mean PM_{10} Concentration (µg/m³)
CM1	Barnsley A635	Roadside	5.0	1.45	-	18.0
CM2	Barnsley A635	Roadside	3.5	1.70	32.0	-
CM3	Barnsley Gawber	Urban Background	N/A	4.00	16.0	-

As indicated in Table 4.1, all identified NO_2 automatic monitoring station monitored a concentration below the AQO for NO_2 (40 µg/m³ annual mean) during 2018. With automatic monitoring station CM1 monitored a concentration below the AQO for PM_{10} (40 µg/m³ annual mean) during 2018.

Due to the distance from the Proposed Development site, no automatic monitoring stations were used as part of the model verification.

Non-Continuous Monitoring

BMBC operated a network of 55 diffusion tubes during 2018. Reference should be made to Figure 1 for the locations of the diffusion tubes within the extents of the air quality study area. The closest diffusion tube to the Proposed Development site is DT24, which is located 320 m south-west of the site boundary.

The most recently available diffusion tube monitoring data is from 2018, which is presented in Table 4.2.

Table 4.2 Monitored Annual Mean NO_2 Concentrations

Site ID	Location	Site Type	Distance from Kerb (m)	Inlet Height (m)	2018 Annual Mean NO_2 Concentration (µg/m³)
DT24	A6135 Hoyland	Kerbside	1	2.8	30.2
DT25	A61 Sheffield Road, Birdwell	Roadside	1.5	2.9	34.3
DT26	A61 Sheffield Road, Birdwell	Roadside	1.5	2.8	40.1
DT27	A61 Sheffield Road, Birdwell	Roadside	n/a	2.9	39.1
DT28*	Tankersley School	Roadside	n/a	2.8	23.9
DT29*	Moor Lane, Birdwell	Urban Background	n/a	2.7	27.6
DT30*	The Walk, Birdwell	Roadside	n/a	2.6	29.5
DT31	Sheffield Rd – Birdwell	Roadside	2.5	3.0	29.7
DT32	Sheffield Rd – Chapel Street, Birdwell	Roadside	n/a	2.75	32.8
*Located within the AQMA					

As indicated in Table 4.2, diffusion tube DT26 monitored an exceedance of the NO_2 AQO (40µg/m^3 annual mean) in 2018. The remaining diffusion tubes did not monitored exceedances of the NO_2 AQO (40µg/m^3 annual mean) in 2018.

4.2 Meteorology

Meteorological conditions have significant influence over air pollutant concentrations and dispersion. Pollutant levels can vary significantly from hour to hour as well as day to day, thus any air quality predictions need to be based on detailed meteorological data. The ADMS model calculates the dispersion of pollutants on an hourly basis using a year of local meteorological data. The 2018 meteorological data used in the assessment is derived from Emley Moor No.2 Meteorological Station. This is the nearest meteorological station, which is considered representative of the development site, with all the complete parameters necessary for the ADMS model. Reference should be made to Figure 2 for an illustration of the prevalent wind conditions at the Emley Moor No.2 Meteorological Station site.

4.3 Emission Sources

A desktop assessment has identified that traffic movements are likely to be the most significant local source of pollutants affecting the site and its surroundings. The principal traffic derived pollutants likely to impact local receptors are NO_2, PM_{10} and $PM_{2.5}$.

The assessment has therefore modelled all roads within the immediate vicinity of the proposed development site which are considered likely to experience significant changes in traffic flow as a result of the proposed development. Reference should be made to Figure 1 for a graphical representation of the traffic data utilised within the ADMS Roads 4.1 model.

It should be noted that the pollutant contribution of minor roads and rail sources that are not included within the dispersion model is considered to be accounted for via the use of background air quality levels.

4.4 Sensitive Receptors

Receptors that are considered as part of the air quality assessment are primarily those existing receptors that are situated along routes predicted to experience significant changes in traffic flow as a result of the proposed development.

The existing receptor locations are summarised in Table 4.3 (overleaf) and the spatial locations of all of the receptors are illustrated in Figure 1.

Table 4.3 Modelled Existing Sensitive Receptor Locations

Discrete Sensitive Receptor		Receptor Height (m)
R1	179 Upper Hoyland Road	1.5
R2	High Royd House, High Royd Lane	1.5
R3	12 Shortwood Villas	1.5
R4	261 Sheffield House	1.5
R5	33 Wood View	1.5
R6	10 Sheffield Road	1.5
R7	86 Sheffield Road	1.5
R8	Stonehurst, Sheffield Road	1.5
R9	Hood Hill Farm	1.5
R10*	23 Farlow Croft	1.5
R11*	11 Howbrook Close	1.5
R12	29 Fenn Road	1.5
R13*	Tankersley St Peters CofE Primary	1.5
*Located within the AQMA		

The locations of the existing sensitive receptors are identified on Figure 1.

4.5 Ecological Receptors

Air quality impacts associated with the proposed re-development have the potential to impact on receptors of ecological sensitivity within the vicinity of the site. The IAQM guidance on 'Air Quality Impacts on Designated Nature Conservation Sites' (2019) document outlines the types of designated nature sites within 2 km of the proposed development which require air quality assessment. These are inclusive of;

- Sites of Special Scientific Interest (SSSIs);
- Special Areas of Conservation (SACs);
- Special Protection Areas (SPAs);
- Ramsar Sites;
- Areas of Special Scientific Interest (ASSIs);
- National Nature Reserves (NNRs);
- Local Nature Reserves (LNRs);
- Local Wildlife Sites (LWSs); and,
- Areas of Ancient Woodland (AW).

The Conservation of Habitats and Species Regulations (2017) additionally requires competent authorities to review planning applications and consents that have the potential to impact on European designated sites (e.g. Special Protection Areas).

A study was undertaken to identify any statutory designated sites of ecological or nature conservation importance within the extents of the dispersion modelling assessment. This was completed using the Multi-

Agency Geographic Information for the Countryside (MAGIC) web-based interactive mapping service, which draws together information on key environmental schemes and designations.

Following a search within a 2 km radius of the site boundary, one ecological receptor was identified, as shown in Table 4.4 below. In accordance with the IAQM Guidance, several points have been included at some sites as part of the assessment.

Table 4.4 Ecological Receptors

Site ID	Site	Designation	UK NGR (m)		Distance from Site (km)	Distance from Road Centre Line (m)
			X	Y		
E1	Potter Holes Plantation	LNR	434142	399524	1.73	15
E2	Potter Holes Plantation	LNR	434323	399828	1.39	15
E3	Worsborough Country Park	LNR	434398	402843	1.56	244
E4	Worsborough Country Park	LNR	433929	403620	2.47	262
E5	Worsborough Country Park	LNR	434701	402818	1.38	17

It should be noted that the IAQM Guidance only requires the assessment of ecological receptors which are located within 200m of the road network. Due to the distance from the modelled road network, ecological receptor E3 can be scoped out of this air quality assessment.

It should be noted that Natural England Guidance requires a detailed assessment of the impact of emissions from road traffic where a predicted traffic flow change is greater than 1000 AADT or more, or an increase of 200 AADT or more of heavy-duty vehicles. Due to associated traffic flow changes, E4 and E5 can be scoped out of this air quality assessment in line with the Natural England HRA guidance.

5. Assessment of Air Quality Impacts - Construction Phase

5.1 Pollutant Sources

The main emissions during construction are likely to be dust and particulate matter generated during earth moving (particularly during dry months) or from construction materials. The main potential effects of dust and particulate matter are:

- Visual - dust plume, reduced visibility, coating and soiling of surfaces leading to annoyance, loss of amenity, the need to clean surfaces;
- Physical and/or chemical contamination and corrosion of artefacts;
- Coating of vegetation and soil contamination; and,
- Health effects due to inhalation e.g. asthma or irritation of the eyes.

A number of other factors such as the amount of precipitation and other meteorological conditions will also greatly influence the amount of particulate matter generated.

Construction activities can give rise to short-term elevated dust/PM_{10} concentrations in neighbouring areas. This may arise from vehicle movements, soiling of the public highway, demolition or windblown stockpiles.

5.2 Particulate Matter (PM_{10})

The UK Air Quality Standards seek to control the health implications of respirable PM_{10}. However, the majority of particles released from construction will be greater than this in size.

Construction works on site have the potential to elevate localised PM_{10} concentrations in the area. On this basis, mitigation measures should still be taken to minimise these emissions as part of good site practice.

5.3 Dust

Particles greater than 10µm are likely to settle out relatively quickly and may cause annoyance due to their soiling capability. Although there is no formal standards or criteria for nuisance caused by deposited particles, the IAQM 'Guidance on Monitoring in the Vicinity of Demolition and Construction Sites' (October 2018) and the Environment Agency Technical Guidance Note (TGN) M17 states that dust is usually compared with a 'complaints likely' guideline of 200mg/m^2/day. Therefore, a deposition rate of 200mg/m^2/day is often presented as a threshold for serious nuisance though this is usually only applied to long term exposure as people are generally more tolerant of dust for a short or defined period. Significant nuisance is likely when the dust coverage of surfaces is visible in contrast with adjacent clean areas, especially when it happens regularly. Severe dust nuisance occurs when the dust is perceptible without a clean reference surface.

Construction activities have the potential to suspend dust, which could result in annoyance of residents surrounding the site. Measures will be taken to minimise the emissions of dust as part of good site practice.

Recommended mitigation measures proportionate to the risk associated with the development and based on best practice guidance are discussed in the following sections.

5.4 Methodology

The construction phase assessment utilises the IAQM Guidance on the Assessment of Dust from Demolition and Construction document published in February 2014.

Four construction processes are considered; these are demolition, earthworks, construction and trackout. For each of these phases, the significance of the potential dust impacts is derived following the determination of a dust emission magnitude and the distance of activities to the nearest sensitive receptor, therefore assessing worst case impacts. A full explanation of the methodology is contained in Appendix A.

5.5 Assessment Results

Based on the methodology detailed in Appendix A, the scale of the anticipated works has determined the potential dust emission magnitude for each process, as presented in the Table 5.1 below.

Table 5.1 Dust Emission Magnitude

Construction Process	Site Criteria	Dust Emission Magnitude
Demolition	No demolition required	N/A
Earthworks	Total site area >10,000 m^2	Large
Construction	Total building volume > 100,000 m^3	Large
Trackout	Assumed >50 HDV outward movements, unpaved road length >100 m	Large

The sensitivity of the surrounding area to each construction process has been determined following stage 2B of the IAQM guidance. The assessment has determined the area sensitivities as shown in the Table 5.2.

Table 5.2 Sensitivity of the Area

Source	Area Sensitivity					
	Dust Soiling	Site Sensitivity Criteria	Health Effects of PM_{10}	Site Sensitivity Criteria	Ecological	Site Sensitivity Criteria
Demolition	N/A – No demolition required					
Earthworks	Medium	10-100 Highly Sensitive Receptors within 50 m	Low	Annual Mean of <24 ug/m^3 for PM_{10} 10-100 Highly Sensitive Receptors within 50 m	N/A	<50 m from site boundary
Construction	Medium		Low		N/A	
Trackout	Medium	10-100 Highly Sensitive Receptors within 50 m of roads within 500 m of site exit	Low		N/A	<50 m from roads within 500 m from site boundary

The dust emission magnitude determined in Table 5.1 has been combined with the sensitivity of the area determined in Table 5.2, to determine the risk of impacts prior to the implementation of appropriate mitigation measures. The potential impact significance of dust emissions associated with the construction phase, without mitigation, is presented overleaf.

Table 5.3 Impact Significance of Construction Activities without Mitigation

Source	Summary Risk of Impacts Prior to Mitigation		
	Dust Soiling	Health Effects of PM_{10}	Ecological
Demolition	N/A	N/A	N/A
Earthworks	Medium	Low	N/A
Construction	Medium	Low	N/A
Trackout	Medium	Low	N/A

Appropriate mitigation measures are detailed and presented in Section 8. Following the adoption of these measures, the subsequent impact significance of the construction phase is not predicted to be significant.

6. Assessment of Air Quality Impacts - Operational Phase

In the context of the proposed development, road traffic is identified as the dominant emission source that is likely to cause potential risk of exposure of air pollutants at receptors.

The operational phase assessment therefore consists of the quantified predictions of the change in NO_2, PM_{10} and $PM_{2.5}$ for the operational phase of the development due to changes in traffic movement. Predictions of air quality at the site have been undertaken for the operational phase of the development using ADMS Roads.

In accordance with the provided traffic data, the operational phase assessment has been undertaken with an assumed operational opening year of 2029. The assessment scenarios are therefore:

- 2018 Baseline = Existing baseline conditions;
- 2029 'Do Minimum' = 2029 Baseline Scenario + Committed Developments;
- 2029 'Do Something' = 2029 Baseline Scenario + Committed Developments + Proposed Development Flows.

6.1 Existing and Predicted Traffic Flows

Baseline 2019 data, projected 2029 'do minimum' and 'do something' traffic data and average vehicle speeds have been obtained for the operational phase assessment in the form of Annual Average Daily Traffic figures (AADT). This traffic data was provided by Mosodi Transport Consultants.

To correspond with the latest BMBC monitoring data and meteorological data, a TEMPro factor of 1.02 was applied to the provided 2019 baseline to calculate Baseline 2018 traffic flows.

Additional 2018 traffic data was sourced from the Department for Transport (DfT) road statistic database. To calculate the predicted 2029 opening operational year traffic flows, a TEMPro factor of 1.17 has been applied.

Emission factors for the 2018 baseline and 2029 projected 'do minimum' and 'do something' scenarios have been calculated using the Emission Factor Toolkit Version 9 (May 2019).

In addition to the proposed development, the assessment also includes an assessment of the cumulative traffic impact associated with the Hoyland Masterplan area. As well as the proposed development this also includes the following sites HS64, HS56, HS66 (allocated for residential development in the adopted Barnsley Local Plan) and ES14 (allocated for employment use in the adopted Barnsley Local Plan).

A 50m 20km/hr slow down phase is included on each link at every junction and roundabout within the assessment. All of the roads within the dispersion model are illustrated in Figure 1. Detailed traffic figures are provided in the Table 6.1.

Table 6.1 Traffic Data

Link	Speed (km/h)	2018		2029			
				Do Minimum		Do Something	
		AADT	HGV%	AADT	HGV%	AADT	HGV%
M1S	112	88722	10.1	90953	10.0	91299	10.1
A61 (west of M1)	70	24098	14.0	25166	13.6	25640	14.0
M1 N	112	92542	10.8	94889	10.7	95311	10.9
A61 Sheffield Road	45	20648	8.1	21175	8.1	21366	8.0
A61 Link East of M1 J36	64	36764	12.4	39711	11.7	40953	12.6
A6135 S of B6096	48	10567	6.7	11286	6.3	11529	6.2
Tankersley Lane	48	6538	5.2	6662	5.2	6662	5.2
B6096	48	10844	6.8	12553	6.0	12553	6.0
A6135 N of B6096	45	12947	8.7	14431	7.9	14674	7.8
A6195 S of Kestrel Way	64	22312	13.0	24123	12.3	25555	13.7
Sheffield Road	64	2421	8.5	2756	7.6	2955	7.1
A6195 W of Phase 3	80	23675	12.6	25147	12.0	26778	13.3
A6195 E of Phase 3	80	23675	12.6	25147	12.0	26702	13.1
Proposed Access Road	48	0	0.0	0	0.0	1937	0.0
A6195 E of Phase 2	112	23261	12.5	24751	11.9	25415	12.6
A616 (East of Westwood Roundabout)	96	20270	11.3	23754	11.3	23912	11.5
A61 (South of Westwood Roundabout)	80	14074	3.2	16493	3.2	16651	3.5
A616 (West of Westwood Roundabout)	96	25089	10.8	29402	10.8	29560	10.9

6.2 Background Concentrations

The use of background concentrations within the modelling process ensures that pollutant sources other than traffic are represented appropriately. Background sources of pollutants include industrial, domestic and rail emissions within the vicinity of the study site. Several sources have been used to obtain representative background levels as discussed below.

The background concentrations used within the assessment have been determined with reference to the IAQM Guidance and TG (16).

The IAQM Guidance states:

> "*A matter of judgement should take into account the background and future background air quality and whether it is likely to approach or exceed the value of the AQO.*"

Additionally, TG (16) states:

> "*Typically only the process contributions from local sources are represented within and output by the dispersion model. In these circumstances, it is necessary to add an appropriate background concentration(s) to the modelled source contributions to derive the total pollutant concentrations.*"

Defra Published Background Concentrations for 2018

The background concentrations shown in Table 6.2 below were referenced from the UK National Air Quality Information Archive database based on the National Grid Co-ordinates of 1 x 1 km grid squares nearest to the development site. In May 2019, Defra issued revised 2018 based background maps for nitrogen oxide (NO_X), NO_2, PM_{10} and $PM_{2.5}$. The mapped background concentrations are summarised in Table 6.2.

Table 6.2 Published Background Air Quality Levels (µg/m³)

Receptor Location	2018			
	NO_2	NO_x	PM_{10}	$PM_{2.5}$
Local Authority Monitoring				
DT24	13.67	18.93	10.93	7.01
DT25	17.40	24.77	12.49	7.87
DT26	17.40	24.77	12.49	7.87
DT27	17.40	24.77	12.49	7.87
DT31	14.17	19.66	11.23	7.24
Existing Sensitive Receptors				
R1	13.90	19.42	11.09	6.97
R2	12.15	16.61	11.02	6.90
R3	12.15	16.61	11.02	6.90
R4	17.40	24.77	12.49	7.87
R5	17.40	24.77	12.49	7.87
R6	13.67	18.93	10.93	7.01
R7	13.67	18.93	10.93	7.01
R8	13.67	18.93	10.93	7.01
R9	16.08	22.71	12.15	7.67
R10*	10.07	13.55	10.18	6.46
R11*	10.62	14.38	9.65	6.42
R12	12.22	16.72	10.41	6.77
R13*	17.40	24.77	12.49	7.87
Ecological Sensitive Receptors				
E1	12.22	16.72	10.41	6.77
E2	12.22	16.72	10.41	6.77
*Located within the AQMA				

All the Defra background concentrations detailed in Table 6.2 for 2018, show that the background levels are predicted to be below the relevant AQO within the study area.

A breakdown of the background source apportionment of NO_X concentrations at each monitoring location and receptor is shown in Table 6.3.

Table 6.3 Pollutant Source Apportionment of NO_X (µg/m^3)

Receptor Location	2018						
	Total NO_x	% of NO_X from Road Sources	% of NO_X from Industrial Sources	% of NO_X from Domestic Sources	% of NO_X from Aircraft Sources	% of NO_X from Rail Sources	% of NO_X from Other Sources
Local Authority Monitoring Locations							
DT24	19.89	47.39	5.99	5.16	0.00	1.33	40.14
DT25	26.10	79.79	6.30	4.18	0.00	1.16	39.79
DT26	26.10	79.79	6.30	4.18	0.00	1.16	39.79
DT27	26.10	79.79	6.30	4.18	0.00	1.16	39.79
DT31	20.70	54.04	5.53	4.17	0.00	1.08	39.26
Modelled Receptor Locations							
R1	20.34	37.17	13.23	4.44	0.00	1.36	43.80
R2	17.45	42.09	6.57	4.34	0.00	1.38	45.62
R3	17.45	42.09	6.57	4.34	0.00	1.38	45.62
R4	26.10	60.81	4.80	3.18	0.00	0.88	30.32
R5	26.10	60.81	4.80	3.18	0.00	0.88	30.32
R6	19.89	47.39	5.99	5.16	0.00	1.33	40.14
R7	19.89	47.39	5.99	5.16	0.00	1.33	40.14
R8	19.89	47.39	5.99	5.16	0.00	1.33	40.14
R9	23.98	53.88	4.83	3.81	0.00	2.10	35.38
R10*	14.16	30.88	7.54	4.39	0.00	1.76	55.44
R11*	15.05	31.52	6.45	7.71	0.00	1.78	52.54
R12	17.51	42.36	7.07	3.72	0.00	1.47	45.38
R13*	26.10	60.81	4.80	3.18	0.00	0.88	30.32
Ecological Receptor Locations							
E1	17.51	42.36	7.07	3.72	0.00	1.47	45.38
E2	17.51	42.36	7.07	3.72	0.00	1.47	45.38
*Located within the AQMA							

Table 6.3 above shows that the major background source of NO_x at the monitoring and sensitive receptor locations, where sources have been identified is comprised of 'other sources' but road sources make up the bulk of identified sources.

A review of the Defra background concentrations shows that the NO_2 concentrations at the monitoring and sensitive receptor locations are lower in comparison to the LA monitoring. For the ecological sensitive receptor locations, a review of the NO_X background concentrations using the Air Pollution Information System (APIS) website[1] has been undertaken. A detailed search for these conservation sites on the website has determined

[1] http://www.apis.ac.uk/

the background concentration. The background concentrations at the conservation sites are considered to be the most representative.

Table 6.4 shows the background concentrations utilised within the verification.

Table 6.4 Utilised Background Concentrations (µg/m³)

Receptor Location	2018		Source
	NO_2	NO_x	
Local Authority Monitoring			
DT24	13.67	18.93	Defra Published Backgrounds
DT25	17.40	24.77	
DT26	17.40	24.77	
DT27	17.40	24.77	
DT31	14.17	19.66	
Existing Sensitive Receptors			
R1	13.90	19.42	Defra Published Backgrounds
R2	12.15	16.61	
R3	12.15	16.61	
R4	17.40	24.77	
R5	17.40	24.77	
R6	13.67	18.93	
R7	13.67	18.93	
R8	13.67	18.93	
R9	16.08	22.71	
R10*	10.07	13.55	
R11*	10.62	14.38	
R12	12.22	16.72	
R13*	17.40	24.77	
Proposed Sensitive Receptors			
E1	-	19.78	Apis Background Concentrations
E2	-	19.78	
*Located within the AQMA			

6.3 Model Verification

Model verification involves the comparison of modelled data to monitored data in order to gain the best possible representation of current pollutant concentrations for the assessment years. The verification process is in general accordance with that contained in Section 7 of the TG16 guidance note and uses the most recently available diffusion tube monitoring data to best represent this.

The verification process consists of using the monitoring data and the published background air quality data in the UK National Air Quality Information Archive to calculate the road traffic contribution of NO_X at the monitoring locations. Outputs from the ADMS Roads model are provided as predicted road traffic contribution NO_X emissions. These are converted into predicted roadside contribution NO_2 exposure at the relevant

receptor locations based on the updated approach to deriving NO_2 from NO_X for road traffic sources published in Local Air Quality Management TG16. The calculation was derived using the NO_X to NO_2 worksheet in the online LAQM tools website hosted by Defra. Table 6.6 summarises the final model/monitored data correlation following the application of the model correction factor.

Table 6.6 Comparison of Roadside Modelling & Monitoring Results for NO_2

Tube location	NO_2 µg/m³		
	Monitored NO_2	Modelled NO_2	Difference (%)
DT24	30.20	30.52	1.07
DT25	34.30	37.57	9.53
DT26	40.10	38.62	-3.69
DT27	39.10	37.96	-2.92
DT31	29.70	28.55	-3.86
*Located within the AQMA			

The final model produced data at the monitoring locations to within 10% of the monitoring results at all of the receptors, as recommended by TG16 guidance.

The final verification model correlation coefficient (representing the model uncertainty) is 1.00[2]. This figure demonstrates that the model predictions were in line with the road traffic emissions at the monitoring locations.

6.4 Summary of Model Inputs

Table 6.7 Summary of ADMS Roads Model Inputs

Parameter	Description	Input Value
Chemistry	A facility within ADMS-Roads to calculate the chemical reactions in the atmosphere between Nitric Oxide (NO), NO_2, Ozone (O_3) and Volatile organic compounds (VOCs).	No atmospheric chemistry parameters included
Meteorology	Representative meteorological data from a local source	**Emley Moor No.2 Meteorological Station**, hourly sequential data
Surface Roughness	A setting to define the surface roughness of the model area based upon its location.	**0.5m** representing a typical surface roughness for **Parkland, Open Suburbia** were used for both Site Data and Met Measurement Site Data
Latitude	Allows the location of the model area to be set	United Kingdom = **53.5**
Monin-Obukhov Length	This allows a measure of the stability of the atmosphere within the model area to be specified depending upon its character.	Small Towns= **10m** was used for both Site Data and Met Measurement Site Data
Elevation of Road	Allows the height of the road link above ground level to be specified.	All road links were set at ground level = **0m**.
Road Width	Allows the width of the road link to be specified.	Road width used depended on data obtained from OS map data for the specific road link
Topography	This enables complex terrain data to be included within the model in order to account for turbulence and plume spread effects of topography	No topographical information used
Time Varied Emissions	This enables daily, weekly or monthly variations in emissions to be applied to road sources	No time varied emissions used

[2] This was achieved by applying a model correction factor of 2.13 to roadside predicted NO_X concentrations before converting to NO_2

Parameter	Description	Input Value
Road Type	Allows the effect of different types of roads to be assessed.	**Urban (Not London)** and **Motorway (Not London)** settings were used for the relevant links
Road Speeds	Enables individual road speeds to be added for each road link	Based on Google Map observations
Canyon Height	Allows the model to take account turbulent flow patterns occurring inside a street with relatively tall buildings on both sides, known as a "street canyon".	No canyons used within the model
Road Source Emissions	Road source emission rates are calculated from traffic flow data using the in-built EFT database of traffic emission factors.	The **EFT** Version **9.0 (2019)** dataset was used.
Year	Predicted EFT emissions rates depend on the year of emission.	**2018** data for verification and baseline operational phase assessment **2029** data for the operational phase assessment.
Site Plans	**Source**: The Harris Partnership	**Drawing Title**: Proposed Masterplan 12006-1-100

6.5 ADMS Modelling Results

6.5.1 Traffic Assessment

The ADMS Model has predicted concentrations of NO_2, PM_{10} and $PM_{2.5}$ at relevant receptor locations adjacent to roads likely to be affected by the development, as summarised in the following tables. Only receptors close to roads where there is predicted to be a change in emissions have been assessed.

6.5.2 Assessment Scenarios

For the operational year of 2029, assessment of the effects of emissions from the proposed traffic associated with the scheme, has been undertaken using the Emissions Factor Toolkit (EFT) 2029 emissions rates which take into account of the rate of reduction in emission from road vehicles into the future with the following factors:

- 2018 Baseline = Existing baseline conditions;
- 2029 'Do Minimum' = 2029 Baseline Scenario + Committed Developments; and,
- 2029 'Do Something' = 2029 Baseline Scenario + Committed Developments + Proposed Development Flows.

<u>Nitrogen Dioxide</u>

Table 6.8 presents a summary of the predicted change in NO_2 concentrations at relevant receptor locations, due to changes in traffic flow associated with the development, based on modelled 'do minimum' and 'do something' scenarios.

Table 6.8 Predicted Annual Average Concentrations of NO_2 at Receptor Locations

Receptor		NO_2 (µg/m³)			
		Baseline 2018	Do Minimum 2029	Do Something 2029	Development Contribution
R1	179 Upper Hoyland Road	23.10	17.20	17.31	0.11
R2	High Royd House, High Royd Lane	15.14	13.20	13.24	0.04
R3	12 Shortwood Villas	14.19	12.89	12.91	0.02
R4	261 Sheffield House	36.40	24.43	24.49	0.06
R5	33 Wood View	44.62	27.47	27.63	0.16
R6	10 Sheffield Road	27.93	18.88	19.01	0.13
R7	86 Sheffield Road	32.71	20.80	20.88	0.08
R8	Stonehurst, Sheffield Road	24.95	17.76	17.82	0.06
R9	Hood Hill Farm	21.95	18.31	18.34	0.03
R10*	23 Farlow Croft	12.03	10.90	10.91	0.01
R11*	11 Howbrook Close	14.63	12.40	12.42	0.02
R12	29 Fenn Road	21.32	15.36	15.41	0.05
R13*	Tankersley St Peters CofE Primary	29.02	21.77	21.81	0.04
Annual Mean AQO		**40 µg/m³**			
*Located within the AQMA					

All modelled existing receptors are predicted to be below the AQO for NO_2 in both the 'do minimum' and 'do something' scenarios.

As indicated in Table 6.8, the maximum predicted increase in the annual average exposure to NO_2 at any existing receptor, due to changes in traffic movements associated with the development, is 0.16 µg/m³ at 33 Wood View (R5).

The impact description of changes in traffic flow associated with the development with respect to annual mean NO_2 exposure has been assessed with reference to the criteria in Section 3. The outcomes of the assessment are summarised in Table 6.9.

Table 6.9 Significance of Effects at Key Receptors (NO_2)

NO_2 Significance Effects at Key Receptors					
Receptor	Change Due to Development (DS-DM) (µg/m³)	Change due to Development (% of AQO)	% Change in Concentration Relative to AQO	% Annual Mean Concentration in Assessment Year	Impact Description
R1	0.11	0.27	0%	≤75% of AQO	Negligible
R2	0.04	0.10	0%	≤75% of AQO	Negligible
R3	0.02	0.05	0%	≤75% of AQO	Negligible
R4	0.06	0.15	0%	≤75% of AQO	Negligible
R5	0.16	0.40	0%	≤75% of AQO	Negligible
R6	0.13	0.32	0%	≤75% of AQO	Negligible
R7	0.08	0.20	0%	≤75% of AQO	Negligible
R8	0.06	0.15	0%	≤75% of AQO	Negligible
R9	0.03	0.07	0%	≤75% of AQO	Negligible
R10*	0.01	0.02	0%	≤75% of AQO	Negligible
R11*	0.02	0.05	0%	≤75% of AQO	Negligible
R12	0.05	0.12	0%	≤75% of AQO	Negligible
R13*	0.04	0.10	0%	≤75% of AQO	Negligible

NO_2 Significance Effects at Key Receptors					
Receptor	**Change Due to Development (DS-DM) (µg/m³)**	**Change due to Development (% of AQO)**	**% Change in Concentration Relative to AQO**	**% Annual Mean Concentration in Assessment Year**	**Impact Description**
*0% means a change of <0.5% as per explanatory note 2 of table 6.3 of the EPUK IAQM Guidance.					
*Located within the AQMA					

The significance of the effects of changes in traffic flow as a result of the proposed development, with respect to NO_2 exposure for existing receptors, is determined to be 'negligible' at all modelled receptors. This is based on the methodology outlined in Section 3. Given the quantitative nature of the assessment and the verification of the air quality dispersion model, the confidence of the assessment is deemed to be 'high'.

Particulate Matter (PM_{10})

Table 6.10 presents a summary of the predicted change in annual mean PM_{10} concentrations at relevant receptor locations, due to changes in traffic flow associated with the development, based on modelled 'do minimum' and 'do something' scenarios.

Table 6.10 Predicted Annual Average Concentrations of PM_{10} at Receptor Locations

Receptor		**PM_{10} (µg/m³)**			
		Baseline 2018	**Do Minimum 2029**	**Do Something 2029**	**Development Contribution**
R1	179 Upper Hoyland Road	12.47	12.37	12.43	0.06
R2	High Royd House, High Royd Lane	11.41	11.38	11.39	0.01
R3	12 Shortwood Villas	11.27	11.24	11.25	0.01
R4	261 Sheffield House	15.47	15.23	15.25	0.02
R5	33 Wood View	16.56	16.22	16.28	0.06
R6	10 Sheffield Road	12.98	12.90	12.95	0.05
R7	86 Sheffield Road	13.37	13.26	13.29	0.03
R8	Stonehurst, Sheffield Road	12.33	12.22	12.24	0.02
R9	Hood Hill Farm	13.04	13.00	13.02	0.02
R10*	23 Farlow Croft	10.52	10.53	10.54	0.01
R11*	11 Howbrook Close	10.40	10.45	10.47	0.02
R12	29 Fenn Road	11.87	11.76	11.79	0.03
R13*	Tankersley St Peters CofE Primary	13.72	13.54	13.56	0.02
Annual Mean AQO		**40 µg/m³**			
***Located within the AQMA**					

All modelled existing receptors are predicted to be below the AQO for PM_{10} in both the 'do minimum' and 'do something' scenarios.

As indicated in Table 6.10, the maximum predicted increase in the annual average exposure to PM_{10} at any existing receptor, due to changes in traffic movements associated with the development, is 0.06 µg/m³ at 179 Upper Hoyland Road (R1) and 33 Wood View (R5).

The impact description of changes in traffic flow associated with the development with respect to annual mean PM_{10} exposure has been assessed with reference to the criteria in Section 3. The outcomes of the assessment are summarised in Table 6.11.

Table 6.11 Significance of Effects at Key Receptors (PM_{10})

PM_{10} Significance Effects at Key Receptors					
Receptor	Change Due to Development (DS-DM) (µg/m³)	Change Due to Development (% of AQO)	% Change in Concentration Relative to AQO	% Annual Mean Concentration in Assessment Year	Impact Description
R1	0.06	0.15	0%	≤75% of AQO	Negligible
R2	0.01	0.03	0%	≤75% of AQO	Negligible
R3	0.01	0.01	0%	≤75% of AQO	Negligible
R4	0.02	0.05	0%	≤75% of AQO	Negligible
R5	0.06	0.16	0%	≤75% of AQO	Negligible
R6	0.05	0.12	0%	≤75% of AQO	Negligible
R7	0.03	0.08	0%	≤75% of AQO	Negligible
R8	0.02	0.05	0%	≤75% of AQO	Negligible
R9	0.02	0.05	0%	≤75% of AQO	Negligible
R10*	0.01	0.02	0%	≤75% of AQO	Negligible
R11*	0.02	0.05	0%	≤75% of AQO	Negligible
R12	0.03	0.08	0%	≤75% of AQO	Negligible
R13*	0.02	0.05	0%	≤75% of AQO	Negligible
*0% means a change of <0.5% as per explanatory note 2 of table 6.3 of the EPUK IAQM Guidance.					
*Located within the AQMA					

The significance of the effects of changes in traffic as a result of the proposed development, with respect to annual mean PM_{10} exposure for existing receptors is determined to be 'negligible' based on the methodology outlined in Section 3. Given the quantitative nature of the assessment and the verification of the air quality dispersion model, the confidence of the assessment is deemed to be 'high'.

Particulate Matter ($PM_{2.5}$)

Table 6.12 presents a summary of the predicted change in annual mean $PM_{2.5}$ concentrations at relevant receptor locations, due to changes in traffic flow associated with the development, based on modelled 'do minimum' and 'do something' scenarios.

Table 6.12 Predicted Annual Average Concentrations of $PM_{2.5}$ at Receptor Locations

Receptor		$PM_{2.5}$ (µg/m³)			
		Baseline 2018	Do Minimum 2029	Do Something 2029	Development Contribution
R1	179 Upper Hoyland Road	7.80	7.67	7.70	0.03
R2	High Royd House, High Royd Lane	7.14	7.10	7.10	<0.01
R3	12 Shortwood Villas	7.05	7.02	7.03	0.01
R4	261 Sheffield House	9.68	9.41	9.42	0.01
R5	33 Wood View	10.37	9.97	10.00	0.03
R6	10 Sheffield Road	8.26	8.11	8.14	0.03
R7	86 Sheffield Road	8.52	8.32	8.34	0.02
R8	Stonehurst, Sheffield Road	7.88	7.74	7.75	0.01

Receptor		$PM_{2.5}$ (µg/m³)			
		Baseline 2018	Do Minimum 2029	Do Something 2029	Development Contribution
R9	Hood Hill Farm	8.21	8.15	8.16	0.01
R10*	23 Farlow Croft	6.66	6.66	6.66	<0.01
R11*	11 Howbrook Close	6.86	6.86	6.87	0.01
R12	29 Fenn Road	7.65	7.52	7.54	0.02
R13*	Tankersley St Peters CofE Primary	8.69	8.50	8.51	0.01
Annual Mean AQO		**40 µg/m³**			
*Located within the AQMA					

All modelled existing receptors are predicted to be below the AQO for $PM_{2.5}$ in both the 'do minimum' and 'do something' scenarios.

As indicated in Table 6.12, the maximum predicted increase in the annual average exposure to $PM_{2.5}$ at any existing receptor, due to changes in traffic movements associated with the development, is 0.03 µg/m³ at 179 Upper Hoyland Road (R1), 33 Wood View (R5) and 10 Sheffield Road (R6).

The impact description of changes in traffic flow associated with the development with respect to annual mean $PM_{2.5}$ exposure has been assessed with reference to the criteria in Section 3. The outcomes of the assessment are summarised in Table 6.13.

Table 6.13 Significance of Effects at Key Receptors ($PM_{2.5}$)

$PM_{2.5}$ Significance Effects at Key Receptors					
Receptor	Change Due to Development (DS-DM) (µg/m³)	Change Due to Development (% of AQO)	% Change in Concentration Relative to AQO	% Annual Mean Concentration in Assessment Year	Significance
R1	0.03	0.12	0%	≤75% of AQO	Negligible
R2	<0.01	0.00	0%	≤75% of AQO	Negligible
R3	0.01	0.04	0%	≤75% of AQO	Negligible
R4	0.01	0.06	0%	≤75% of AQO	Negligible
R5	0.03	0.14	0%	≤75% of AQO	Negligible
R6	0.03	0.11	0%	≤75% of AQO	Negligible
R7	0.02	0.07	0%	≤75% of AQO	Negligible
R8	0.01	0.04	0%	≤75% of AQO	Negligible
R9	0.01	0.03	0%	≤75% of AQO	Negligible
R10*	<0.01	0.01	0%	≤75% of AQO	Negligible
R11*	0.01	0.03	0%	≤75% of AQO	Negligible
R12	0.02	0.08	0%	≤75% of AQO	Negligible
R13*	0.01	0.04	0%	≤75% of AQO	Negligible
*0% means a change of <0.5% as per explanatory note 2 of table 6.3 of the EPUK IAQM Guidance.					

The significance of the effects of changes in traffic as a result of the proposed development, with respect to annual mean $PM_{2.5}$ exposure, for existing receptors, is determined to be 'negligible' based on the methodology outlined in Section 3. Given the quantitative nature of the assessment and the verification of the air quality dispersion model, the confidence of the assessment is deemed to be 'high'.

Ecological Sensitive Receptor Locations

Background concentrations at each of the ecologically sensitive sites were determined through a review of the NO_X pollutants published on the APIS website.

The below assessment has been undertaken in accordance with *A Guide to the Assessment of Air Quality Impacts in Designated Nature Conservation Sites* (IAQM, 2019).

Nitrogen Oxide

Table 6.14 presents a summary of the predicted change in NO_X concentrations at relevant receptor locations, due to changes in traffic flow associated with the development, based on modelled 'do minimum' and 'do something' scenarios.

Table 6.14 Predicted Annual Average Concentrations of NO_X at Ecological Receptor Locations

Receptor ID	Ecological Receptor	Predicted Maximum Annual Mean Concentration (µg/m³)				
		Do Minimum 2029 NO_X	Do Something 2029 NO_X	Process Contribution (PC)	PC as %age of AQO	Background
E1	Potter Holes Plantation LNR	25.54	25.64	0.10	0.35	19.78
E2	Potter Holes Plantation LNR	24.84	24.93	0.09	0.30	19.78
Annual Mean AQO/Critical Level (CL)			30 (µg/m3)			

As indicated in Table 6.14, the maximum predicted increase in the annual average exposure to NO_X at any ecological receptor, due to changes in traffic movements associated with the development, is 0.10 µg/m^3 at Potter Holes Plantation (LNR) (E1).

Section 5.5.4.1 of *A Guide to the Assessment of Air Quality Impacts in Designated Nature Conservation Sites*', IAQM 2019 states:

Where the assessment indicates that changes in annual mean NOx concentrations within a designated site cannot be dismissed as imperceptible (i.e. an increase of over 0.4 µg/m³) and the NOx critical level is exceeded, then changes in nutrient nitrogen deposition should be calculated as supporting information to further assist in the evaluation of significance.

The maximum predicted increase in the annual average exposure to NO_X at the identified ecological receptor, due to changes in traffic movements associated with the development, is 0.09 µg/m^3 at Potter Holes Plantation (LNR) which is below the 0.40 µg/m^3 development contribution stated within the guidance of '*A Guide to the Assessment of Air Quality Impacts in Designated Nature Conservation Sites*', IAQM 2019. As a result, no further assessment is required and the impact at (E1) Potter Holes Plantation (LNR) is considered to be negligible.

7. Mitigation

7.1 Construction Phase

The dust risk categories have been determined in Section 5 for each of the four construction activities. The assessment has determined that the potential impact significance of dust emissions associated with the construction phase of the proposed development is 'low risk' at the worst affected receptors.

Using the methodology described in Appendix A, appropriate site-specific mitigation measures associated with the determined level of risk can be found in Section 8.2 of the IAQM Guidance on the Assessment of Dust from Demolition and Construction. The mitigation measures have been divided into general measures applicable to all sites and measures applicable specifically to demolition, earthworks, construction and trackout. They are categorised into 'highly recommended' and 'desirable' measures.

The mitigation measures for the proposed development are detailed in Table 7.1 and 7.2 below:

Table 7.1 Highly Recommended Construction Phase Mitigation Measures

Communications
Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager.
Display the head or regional office contact information
Dust Management
Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.
Make the complaints log available to the local authority when asked.
Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the log book.
Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked
Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.
Avoid site runoff of water or mud.
Ensure all vehicles switch off engines when stationary - no idling vehicles.
Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.
Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems
Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
Use enclosed chutes and conveyors and covered skips
Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
Avoid bonfires and burning of waste materials.

Table 7.2 Desirable Construction Phase Mitigation Measures

Construction
For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.
Dust Management
Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority. The level of detail will depend on the risk, and should include as a minimum the highly recommended measures in this document. The desirable measures should be included as appropriate for the site.
Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100m of site boundary, with cleaning to be provided if necessary.
Fully enclose site or specific operations where there is a high potential for dust production and the site is actives for an extensive period.
Keep site fencing, barriers and scaffolding clean using wet methods.
Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below.
Cover, seed or fence stockpiles to prevent wind whipping.
Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on un-surfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate)
Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods
Construction
Avoid scabbling (roughening of concrete surfaces) if possible.
Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.
Trackout
Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use.
Avoid dry sweeping of large areas.
Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.
Record all inspections of haul routes and any subsequent action in a site log book.
Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).

Following the implementation of the mitigation measures detailed in the tables above, the impact significance of the construction phase is not considered to be significant.

7.2 Operational Phase Mitigation - BMBC Air Quality and Emissions Good Practice Planning Guidance

A review of the BMBC Air Quality and Emissions Good Practice Planning Guidance (October 2018) has been undertaken. The outcome of the review has shown that the Proposed Development is categorised as 'Major' development. This means that 'Type 1' and 'Type 2' mitigation should be installed.

<u>'Type 1' Mitigation</u>

Type 1 mitigation includes the installations of Electric Vehicle (EV) charging points. As part of the requirements of the Air Quality Action Plan, residential properties must install one charging point per unit (dwelling with dedicated parking) or one charging point per 10 spaces (unallocated parking). The specification

of the charging points should in be accordance with Appendix 4 of the BMBC Air Quality and Emissions Good Practice Planning Guidance.

'Type 2' Mitigation

Type 2 mitigation includes the implementation of a Travel Plan in accordance with Appendix 5 of the BMBC Air Quality and Emissions Good Practice Planning Guidance. The Travel Plan should include measures which reduce the number of high emission vehicles and shift towards sustainable transport measures (e.g. public transport, walking and cycling). As well as the promotion of low emissions fuels and technologies.

'Type 3' Mitigation

Type 3 mitigation includes the implementation of a Travel Plan in accordance with Appendix 5 of the BMBC Air Quality and Emissions Good Practice Planning Guidance. The Travel Plan should include measures which reduce the use of private vehicles, and supports the use of pooled low emission vehicles, and further reduction of high emission vehicles and shift towards sustainable transport measures (e.g. public transport, walking and cycling). As well as the promotion of low emissions fuels and technologies.

Defra Damage Costs Assessment

A 'damage costs' assessment has been completed. Damage costs are a simple way to value changes in air pollution. They estimate the cost of a change in emissions of different pollutants. While Blackburn does not have a specific policy for completing this assessment, a cost has been completed in line with IAQM and EPUK guidance. (para 5.12)

Additional trips	1,937 AADT
Average distance travelled	10 km
Assumed average speed of	50 kph

Table 7.3 Damage Cost Calculation

Pollutant	Annual Link Emissions (kg/annum)	Over 5 Years (kg/annum)	2018 National Damage Costs (£/tonne)	Valuation (£)
NO_x	6,261	31307	£6,199	£194,073
$PM_{2.5}$	293	1463	£105,836	£154,811
Total				**£348,883**

The mitigation measures have been approximately costed as below to determine whether the mitigation is commensurate to the damage costs presented above.

The total damage costs provide an indication as to the costs associated with the effect from the proposed development on the wider area. The calculated figure will be put towards various mitigation measures shown in Section 8 of the report; it does not represent a sum owed by the developer.

8. Conclusions

WYG has undertaken an Air Quality Assessment to support an application for a proposed employment development at land to the north and south of the Dearne Valley Parkway (Gateway 36 Phases 2 and 3 – Local Plan site references ES17 and ES15).

Construction Phase

Prior to the implementation of appropriate mitigation measures, the potential impact significance of dust emissions associated with the construction phase of the proposed development has potential as 'low' at some worst affected receptors without mitigation. However, appropriate site-specific mitigation measures have been recommended based on Section 8.2 of the IAQM Guidance on the Assessment of Dust from Demolition, Earthworks, Construction and Trackout. It is anticipated that with these appropriate mitigation measures in place, the risk of adverse effects due to emissions from the construction phase will not be significant.

Operational Assessment

An operational assessment of 2029 emissions has been undertaken.

The 2029 assessment of the effect of emissions from traffic associated with the scheme, has determined that the maximum predicted increase in the annual average exposure to NO_2 at any existing receptor is likely to be 0.16 µg/m^3 at 33 Wood View (R5).

For PM_{10}, the maximum predicted increase in the annual average exposure is likely to be 0.06 µg/m^3 at 179 Upper Hoyland Road (R1) and 33 Wood View (R5). For $PM_{2.5}$, the maximum predicted increase in the annual average exposure is likely to be 0.03 µg/m^3 at 179 Upper Hoyland Road (R1), 33 Wood View (R5) and 10 Sheffield Road (R6).

The significance of the effects of changes in traffic flow as a result of the proposed development, with respect to NO_2, PM_{10} and $PM_{2.5}$ exposures, significance is determined to be 'negligible' at all identified receptor locations.

At any proposed sensitive receptors, there is not predicted to be any exceedances of the NO_2, PM_{10} or $PM_{2.5}$ pollutant concentrations and therefore, mitigation is not required at the proposed development.

Habitat Assessment

The maximum predicted increase in the annual average exposure to NO_X at the identified ecological receptor, due to changes in traffic movements associated with the development, is 0.10 µg/m^3 at Potter Holes Plantation LNR which below the 0.40 µg/m^3 development contribution stated within the guidance of '*A Guide to the Assessment of Air Quality Impacts in Designated Nature Conservation Sites* ', IAQM 2019. As a result,

no further assessment is required and the impact at (E1) Potter Holes Plantation (LNR) is considered to be negligible.

Given the quantitative nature of the assessment and the verification of the air quality dispersion model, the confidence of the assessment is deemed to be 'high'. In conclusion, the development is not considered to be contrary to any of the national and local planning policies.

Figures

Figure 1 Air Quality Assessment Area

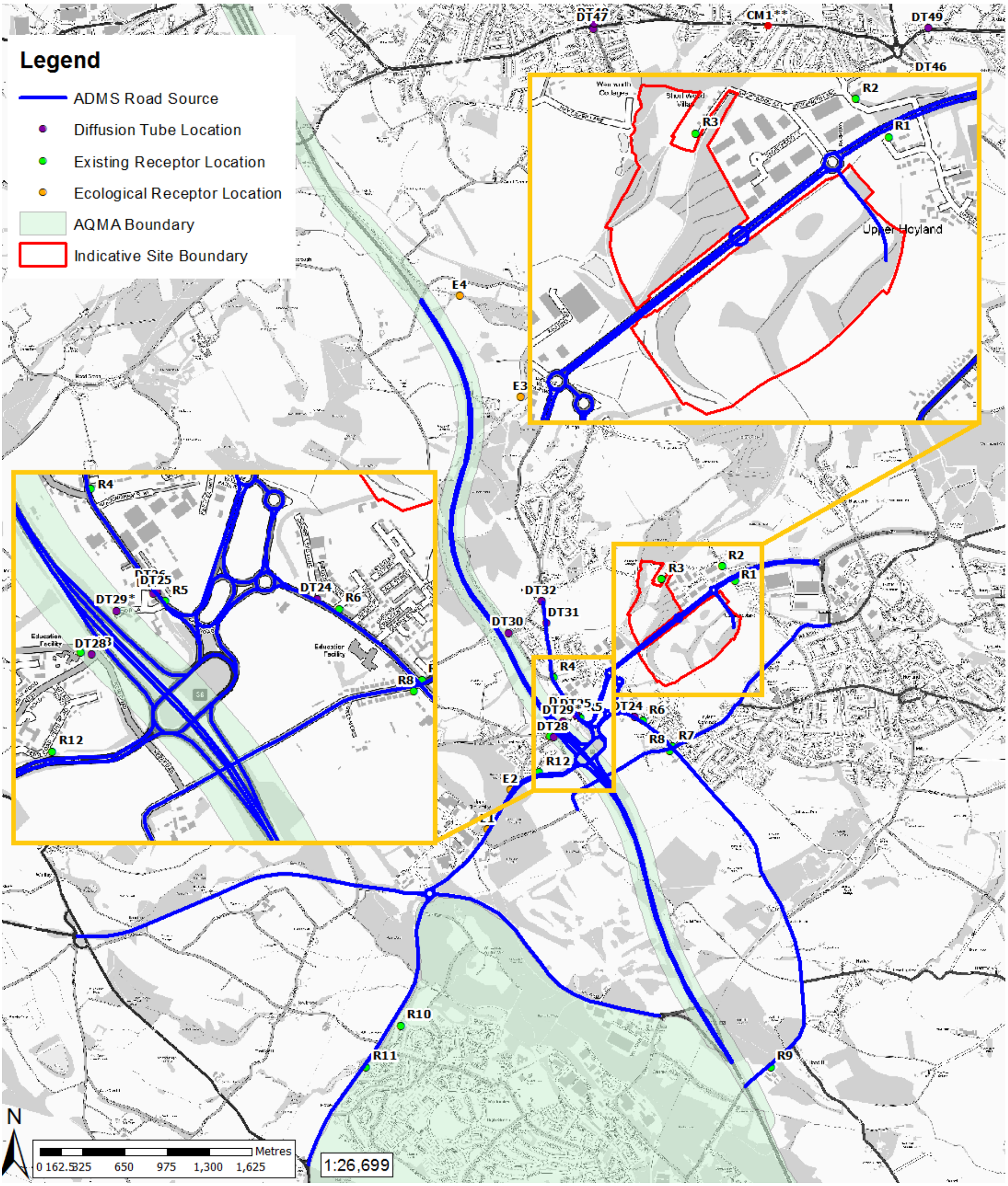
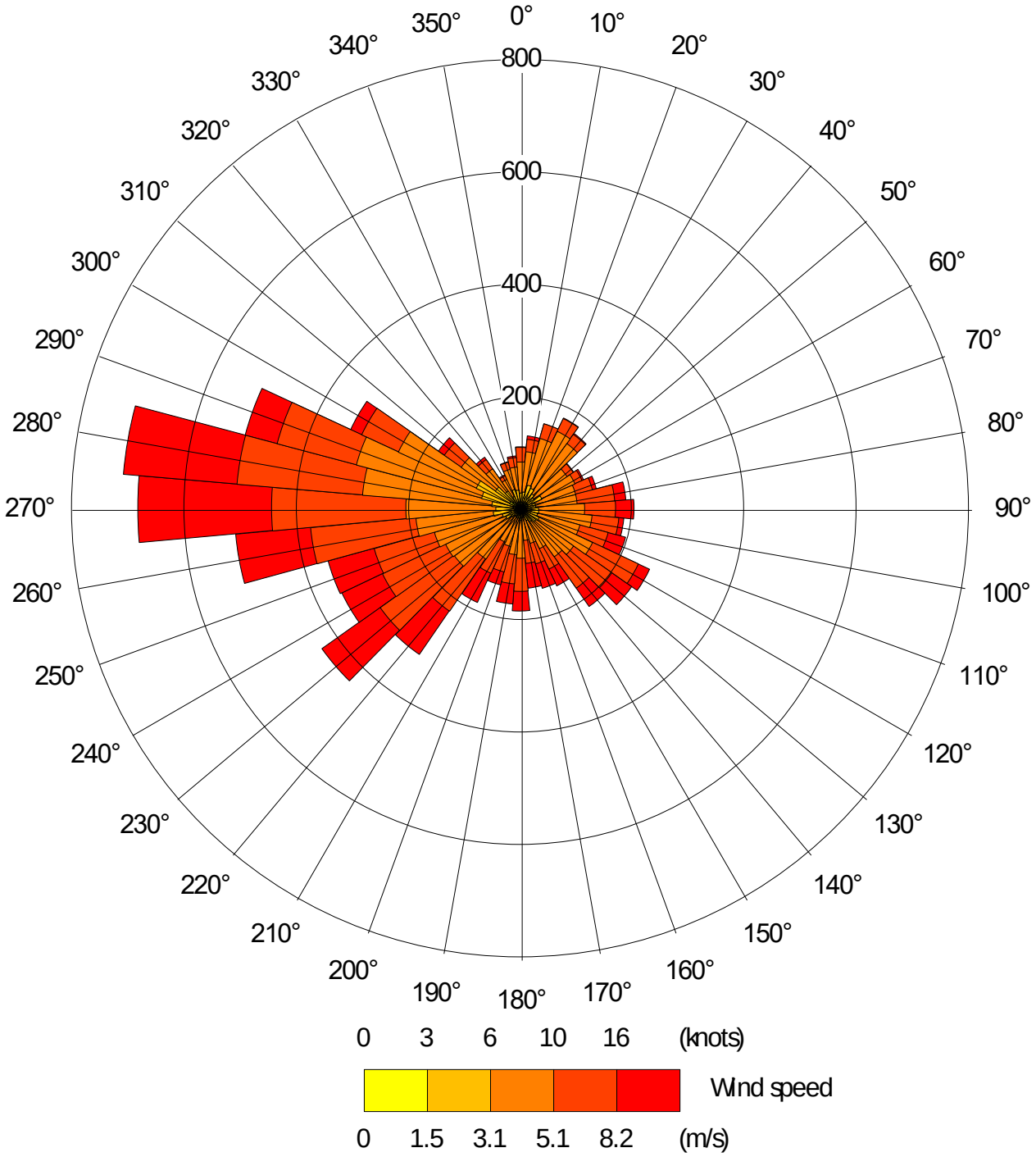


Figure 2 Emley Moor No.2 2018 Meteorological Station Wind Rose



Appendix A Construction Phase Assessment Methodology

The following information sets out the adopted approach to the construction phase impact assessment in accordance with the aforementioned IAQM guidance[3].

Step 1 – Screen the Requirement for a more Detailed Assessment

An assessment is required if there are sensitive receptors within 350m of the site boundary, within 50m of the route(s) used by construction vehicles on the surrounding road network, or within 500m from the site entrance. A detailed assessment is also required if there is an ecological receptor within 50m of the site boundary.

Step 2A – Define the Potential Dust Emission Magnitude

Demolition

The dust emission magnitude for the demolition phase has been determined based on the below criteria:

- *Large*: Total building volume >50 000m^3, potentially dusty construction (e.g. concrete), on-site crushing and screening, demolition activities >20m above ground level;
- *Medium*: Total building volume 20 000m^3 – 50 000m^3, potentially dusty construction material, demolition activities 10-20m above ground level; and,
- *Small*: Total building volume <20 000m^3, construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities <10m above ground, demolition during wetter months.

Earthworks

The dust emission magnitude for the planned earthworks has been determined based on the below criteria:

- *Large:* Total site area >10 000m^2, potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size), > 10 heavy earth moving vehicles active at any one time, formation of bunds >8m in height, total material moved >100 000 tonnes;
- *Medium*: Total site area 2 500m^2 – 10 000m^2, moderately dusty soil type (e.g. silt), 5-10 heavy earth moving vehicles active at any one time, formation of bunds 4m-8m in height, total material moved 20 000 tonnes – 100 000 tonnes; and
- *Small:* Total site area <2 500 m^2, soil type with large grain size (e.g. sand), <5 heavy earth moving vehicles active at any one time, formation of bunds <4 m in height, total material moved <10 000 tonnes, earthworks during wetter months.

Construction

The dust emission magnitude for the construction phase has been determined based on the below criteria:

- *Large:* Total building volume >100 000m^3, on site concrete batching; sandblasting
- *Medium:* Total building volume 25 000m^3 – 100 000m^3, potentially dusty construction material (e.g. concrete), on site concrete batching; and,
- *Small:* Total building volume <25 000m^3, construction material with low potential for dust release (e.g. metal cladding or timber).

Trackout

The dust emission magnitude for trackout has been determined based on the below criteria:

- *Large:* >50 HGV (>3.5t) outward movements in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length >100m;
- *Medium:* 10-50 HGV (>3.5t) outward movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50m – 100m; and,
- *Small:* <10 HGV (>3.5t) outward movements in any one day, surface material with low potential for dust release, unpaved road length <50m.

[3] Institute of Air Quality Management 2014. *Guidance on the Assessment of dust from demolition and construction.*

Step 2B - Defining the Sensitivity of the Area

Sensitivities of People to Dust Soiling Effects

- *High:*
  - Users can reasonably expect a enjoyment of a high level of amenity;
  - The appearance, aesthetics or value of their property would be diminished by soiling; and the people or property would reasonably expect to be present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land; and,
  - Indicative examples include dwellings, museums and other culturally important collections, medium and long term car parks and car showrooms.
- *Medium:*
  - Users can reasonably expect to enjoy a reasonable level of amenity, but would not reasonably expect to enjoy the same level of amenity as in their home;
  - The appearance, aesthetics or value of their property could be diminished by soiling;
  - The people or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land; and,
  - Indicative examples include parks and places of work.
- *Low:*
  - The enjoyment of amenity would not reasonably be expected;
  - Property would not reasonably be expected to be diminished in appearance, aesthetics or value by soiling;
  - There is transient exposure, where the people or property would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land; and,
  - Indicative examples include playing fields, farmland (unless commercially-sensitive horticultural), footpaths, short term car parks and roads.

The sensitivity of the area should be derived for each of the four activities: demolition, construction, earthworks and trackout, using the following table:

Table A1– Sensitivity of the Area to Dust Soiling Effects on People and Property

Receptor Sensitivity	Number of Receptors	Distance from the Source (m)			
		<20	<50	<100	<350
High	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

Note - The likely routes the construction traffic will use should also be included to enable the presence of trackout receptors to be included in the assessment. As a general guidance, without site-specific mitigation, trackout may occur along the public highway up to 500 m from large sites (as defined in step 2A), 200 m from medium sites and 50 m from small sites, as measured from the site exit.

Sensitivities of People to the Health Effects of PM_{10}

- *High:*
  - Locations where members of the public are exposed over a time period relevant to the air quality objective for PM_{10} (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day);
  - Indicative examples include residential properties. Hospitals, schools and residential care homes should also be considered as having equal sensitivity to residential areas for the purposes of this assessment.
- *Medium:*
  - Locations where the people exposed are workers, and exposure is over a time period relevant to the air quality objective for PM_{10} (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day); and,
  - Indicative examples include office and shop workers, but will generally not include workers occupationally exposed to PM_{10}, as protection is covered by Health and Safety at Work legislation.
- *Low:*
  - Locations where human exposure is transient; and,
  - Indicative examples include public footpaths, playing fields, parks and shopping streets.

The sensitivity of the area should be derived for each of the four activities: demolition, construction, earthworks and trackout, using the following table:

Table A2 - Sensitivity of the Area to Human Health Impacts

Receptor Sensitivity	Annual Mean PM_{10} Concentration	Number of Receptors	Distance from the Source (m)				
			<20	<50	<100	<200	<350
High	>32 µg/m³	>100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	28 - 32 µg/m³	>100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	24 – 28 µg/m³	>100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<24 µg/m³	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	-	>10	High	Medium	Low	Low	Low
	-	1-10	Medium	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low	Low

Note - The likely routes the construction traffic will use should also be included to enable the presence of trackout receptors to be included in the assessment. As a general guidance, without site-specific mitigation, trackout may occur along the public highway up to 500 m from large sites (as defined in step 2A), 200 m from medium sites and 50 m from small sites, as measured from the site exit.

Sensitivities of Receptors to Ecological Effects

- *High:*
  - Locations with an international or national designation and the designated features may be affected by dust soiling;
  - Locations where there is a community of a particularly dust sensitive species such as vascular species included in the Red Data List For Great Britain; and,
  - Indicative examples include a Special Area of Conservation (SAC) designated for acid heathlands or a local site designated for lichens adjacent to the demolition of a large site containing concrete (alkali) buildings.
- *Medium:*
  - Locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown;
  - Locations with a national designation where the features may be affected by dust deposition; and,
  - Indicative example is a Site of Special Scientific Interest (SSSI) with dust sensitive features.
- *Low:*
  - Locations with a local designation where the features may be affected by dust deposition; and,
  - Indicative example is a local Nature Reserve with dust sensitive features.

The sensitivity of the area should be derived for each of the four activities: demolition, construction, earthworks and trackout, using the following table:

Table A3 - Sensitivity of the Area to Ecological Impacts

Receptor Sensitivity	Distance from Source (m)	
	<20	<50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

Note - The likely routes the construction traffic will use should also be included to enable the presence of trackout receptors to be included in the assessment. As a general guidance, without site-specific mitigation, trackout may occur along the public highway up to 500 m from large sites (as defined in step 2A), 200 m from medium sites and 50 m from small sites, as measured from the site exit.

Step 2C - Defining the Risk of Impacts

The risk of impacts with no mitigation is determined by combining the dust emission magnitude determined in Step 2A and the sensitivity of the area determined in Step 2B.

The following tables provide a method of assigning the level of risk for each activity.

Demolition

Table A4 - Risk of Dust Impacts, Demolition

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Medium Risk	Low Risk	Negligible

Earthworks

Table A5 - Risk of Dust Impacts, Earthworks

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Construction

Table A6 - Risk of Dust Impacts, Construction

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Trackout

Table A7 - Risk of Dust Impacts, Trackout

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Low Risk	Negligible
Low	Low Risk	Low Risk	Negligible

Step 3 – Site Specific Mitigation

The dust risk categories for each of the four activities determined in Step 2C should be used to define the appropriate, site-specific mitigation measures to be adopted.

These mitigation measures are contained within section 8.2 of the IAQM Guidance on the Assessment of Dust from Demolition and Construction.

Appendix B Alternative (CURED) Future Emissions Scenario Results

Scenario Context

As an additional sensitivity test, an assessment using emissions for 2025, generated from the Calculator Using Realistic Emissions for Diesels (CURED) Version 3A toolkit (23rd January 2018) has been undertaken.

The CURED emissions projections have been developed by Air Quality Consultants (AQC), on the basis that the Defra published EFT fleet emission projections may be over-precautionary in terms of NO_x emissions. The CURED emissions projections incorporate a larger proportion of diesel car, Euro IV, V and VI Heavy Duty Vehicle emissions than the Defra published EFT.

The three assessment scenarios are defined below:

- 2018 Baseline = Existing baseline conditions;
- 2029 'Do Minimum' Theoretical Scenario = Baseline Conditions + Committed Development Flows; and,
- 2029 'Do Something' Theoretical Scenario = Baseline Conditions + Committed Development Flows + Proposed Development Flows.

Model Verification

Table B1 Comparison of Roadside Modelling & Monitoring Results for NO_2

Tube location	NO_2 µg/m³		
	Monitored NO_2	Modelled NO_2	Difference (%)
DT24	30.20	30.62	1.39
DT25	34.30	37.56	9.49
DT26	40.10	38.59	-3.75
DT27	39.10	37.92	-3.01
DT31	29.70	28.54	-3.91
*Located in the AQMA			

The final model produced data at the monitoring locations to within 10% of the monitoring results, which is recommended by TG16 guidance.

The final verification model correlation coefficient (representing the model uncertainty) is 1.00[4]. This figure demonstrates that the model predictions were in line with the road traffic emissions at the monitoring locations.

[4] This was achieved by applying a model correction factor of 2.14 to roadside predicted NO_X concentrations before converting to NO_2

Table B2 CURED Scenario NO_2 Results at Receptor Locations

Receptor		NO_2 (µg/m³)			
		Baseline 2018	Do Minimum 2029	Do Something 2029	Development Contribution
R1	179 Upper Hoyland Road	23.10	18.69	18.83	0.14
R2	High Royd House, High Royd Lane	15.13	13.67	13.72	0.05
R3	12 Shortwood Villas	14.18	13.23	13.26	0.03
R4	261 Sheffield House	36.35	27.48	27.58	0.10
R5	33 Wood View	44.65	31.52	31.73	0.21
R6	10 Sheffield Road	28.00	21.02	21.19	0.17
R7	86 Sheffield Road	32.84	23.65	23.77	0.12
R8	Stonehurst, Sheffield Road	24.99	19.51	19.58	0.07
R9	Hood Hill Farm	21.93	19.34	19.39	0.05
R10*	23 Farlow Croft	12.02	11.31	11.32	0.01
R11*	11 Howbrook Close	14.61	13.28	13.30	0.02
R12	29 Fenn Road	21.34	16.71	16.78	0.07
R13*	Tankersley St Peters CofE Primary	28.87	23.74	23.82	0.08
Annual Mean AQO		**40 µg/m³**			
*Located in the AQMA					

All modelled existing receptors are predicted to be below the AQO for NO_2 in both the 'do minimum' and 'do something' scenarios.

As indicated in Table B2, the maximum predicted increase in the annual average exposure to NO_2 at any existing receptor, due to changes in traffic movements associated with the development, is 0.21 µg/m³ at 33 Wood View (R5).

The impact description of changes in traffic flow associated with the development with respect to annual mean NO_2 exposure has been assessed with reference to the criteria in Section 3. The outcomes of the assessment are summarised in Table B3.

Table B3 Impact Description of Effects at Key Receptors (NO_2)

Impact Description of NO_2 Effects at Key Receptors					
Receptor	Change Due to Development (DS-DM) (µg/m³)	Change due to Development (% of AQO)	% Change in Concentration Relative to AQO	% Annual Mean Concentration in Assessment Year	Impact Description
R1	0.14	0.35	0%	≤75% of AQO	Negligible
R2	0.05	0.12	0%	≤75% of AQO	Negligible
R3	0.03	0.07	0%	≤75% of AQO	Negligible
R4	0.10	0.25	0%	≤75% of AQO	Negligible
R5	0.21	0.52	1%	76-94% of AQO	Negligible
R6	0.17	0.42	0%	≤75% of AQO	Negligible
R7	0.12	0.30	0%	≤75% of AQO	Negligible
R8	0.07	0.17	0%	≤75% of AQO	Negligible
R9	0.05	0.12	0%	≤75% of AQO	Negligible
R10	0.01	0.02	0%	≤75% of AQO	Negligible
R11	0.02	0.05	0%	≤75% of AQO	Negligible
R12	0.07	0.17	0%	≤75% of AQO	Negligible
R13*	0.08	0.20	0%	≤75% of AQO	Negligible

Impact Description of NO_2 Effects at Key Receptors					
Receptor	**Change Due to Development (DS-DM) (µg/m³)**	**Change due to Development (% of AQO)**	**% Change in Concentration Relative to AQO**	**% Annual Mean Concentration in Assessment Year**	**Impact Description**
*0% means a change of <0.5% as per explanatory note 2 of table 6.3 of the EPUK IAQM Guidance.					
*Located in the AQMA					

The impact description of the effects of changes in traffic flow as a result of the proposed development, with respect to NO_2 exposure for existing receptors, is determined to be 'negligible' at all identified receptors. This is based on the methodology outlined in Section 3.

Appendix C Report Terms & Conditions

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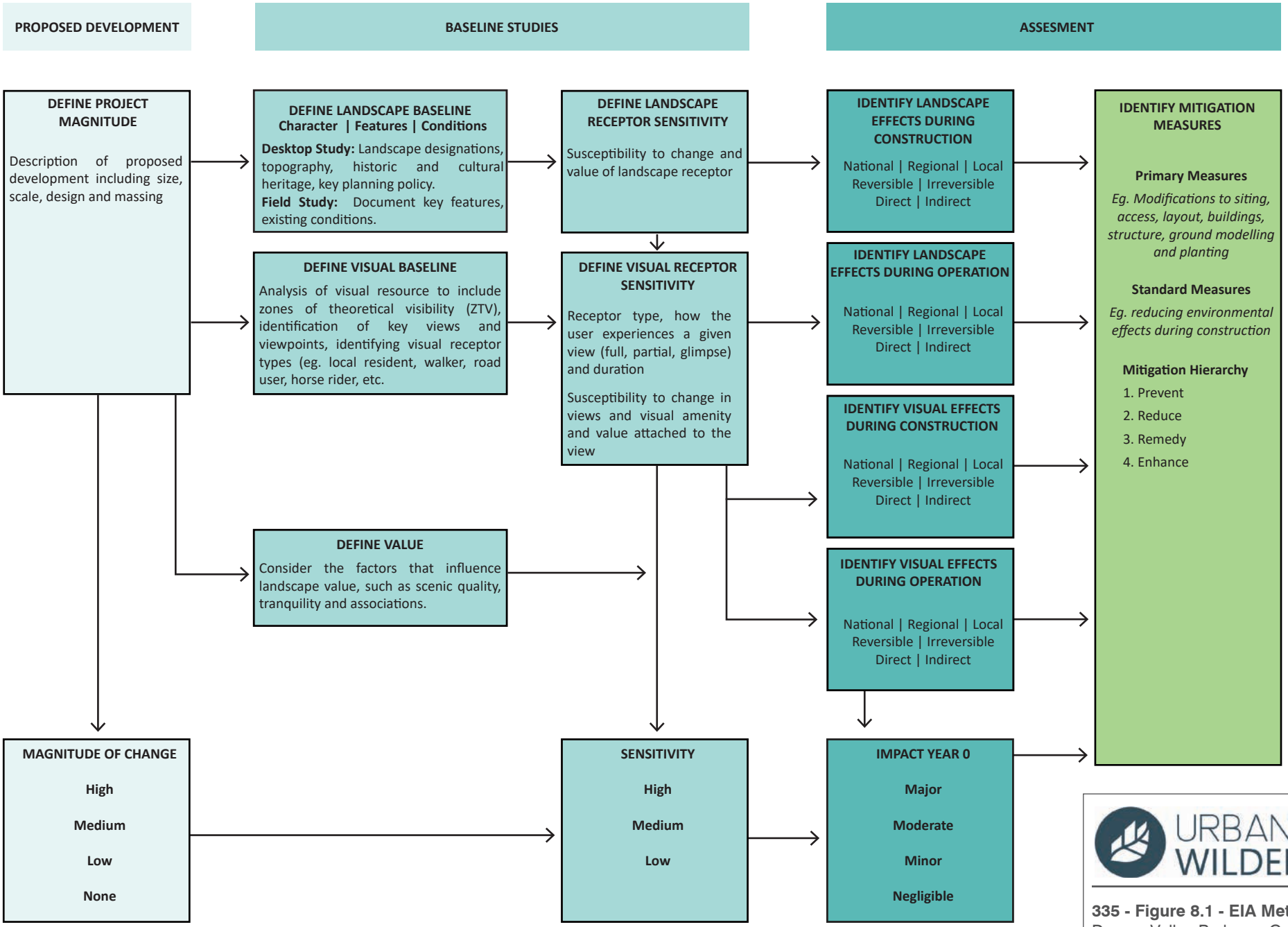
The report refers, within the limitations stated, to the environment of the site in the context of the surrounding area at the time of the inspections'. Environmental conditions can vary and no warranty is given as to the possibility of changes in the environment of the site and surrounding area at differing 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.

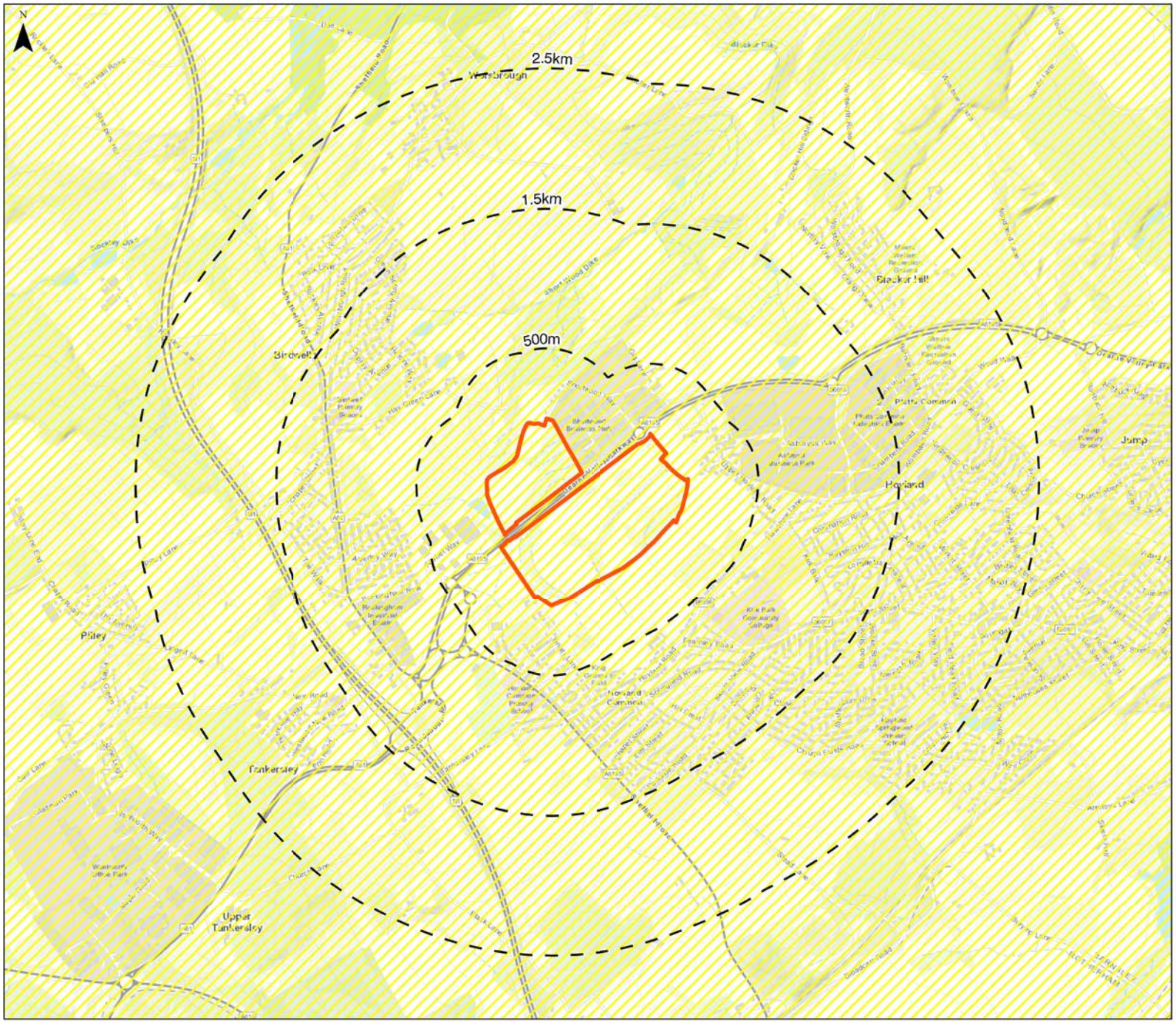
The performance of environmental protection measures and of buildings and other structures in relation to acoustics, vibration, noise mitigation and other environmental issues is influenced to a large extent by the degree to which the relevant environmental considerations are incorporated into the final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

10. Ecology Appendices



URBAN WILDERNESS

335 - Figure 8.1 - EIA Methodology
Dearne Valley Parkway, Gateway 36
Barnsley , 14 JAN 20



NOTES
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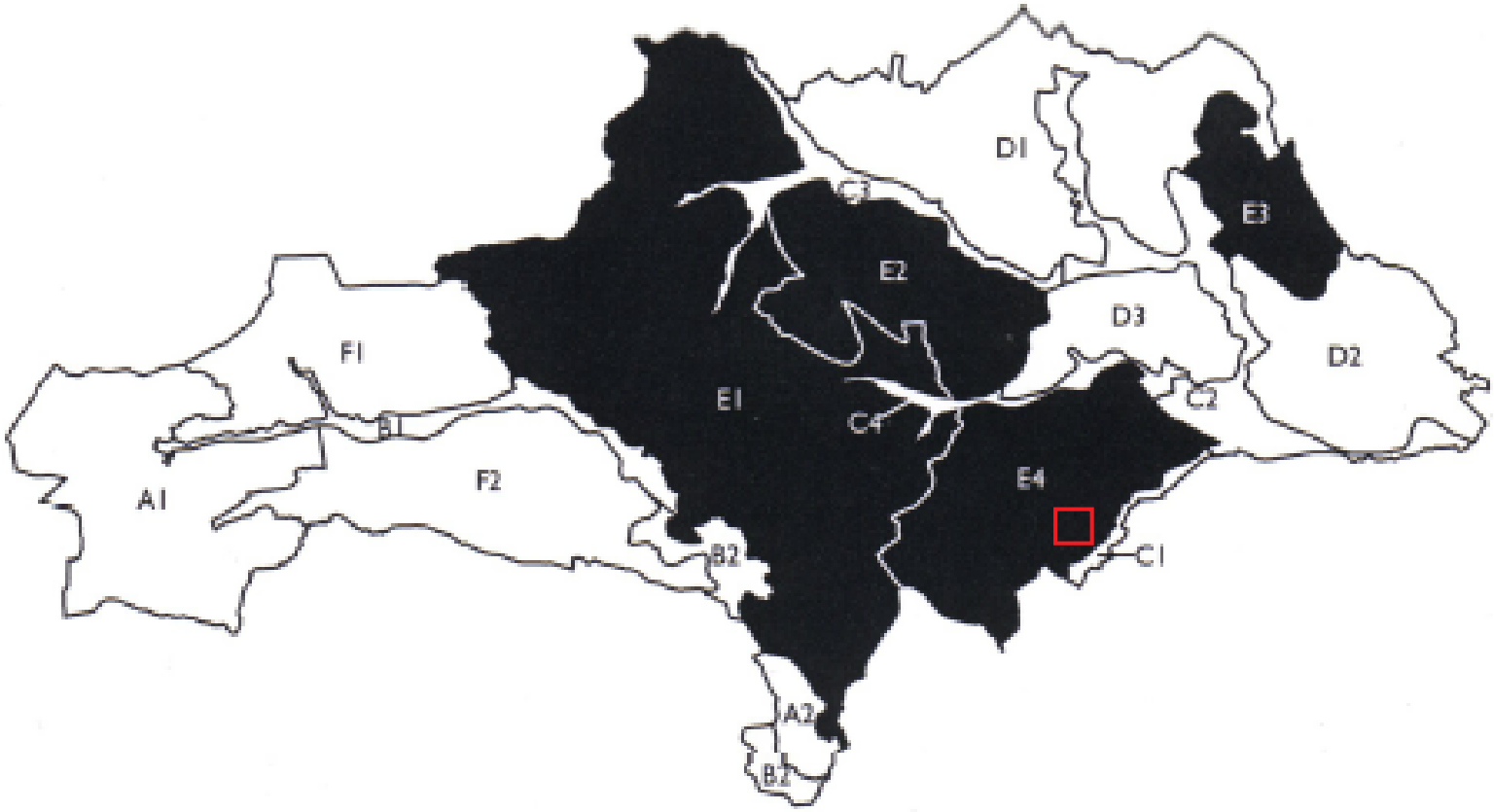
Proposed Site Boundary

Nottinghamshire, Derbyshire and Yorkshire Coalfield

URBAN WILDERNESS

335 - Figure 8.2 - National Landscape Character

Dearne Valley Parkway, Gateway 36
Barnsley , 14 JAN 20



Key

Approximate site boundary marked in red

Local Landscape Character Area: E Settled Wooded Farmland

Figure from: Borough of Barnsley Landscape Character Assessment (2002) by ECUS and Land Use Consultants

(Highest quality figure available)

URBAN WILDERNESS

335 - Figure 8.3 - Local Landscape Character
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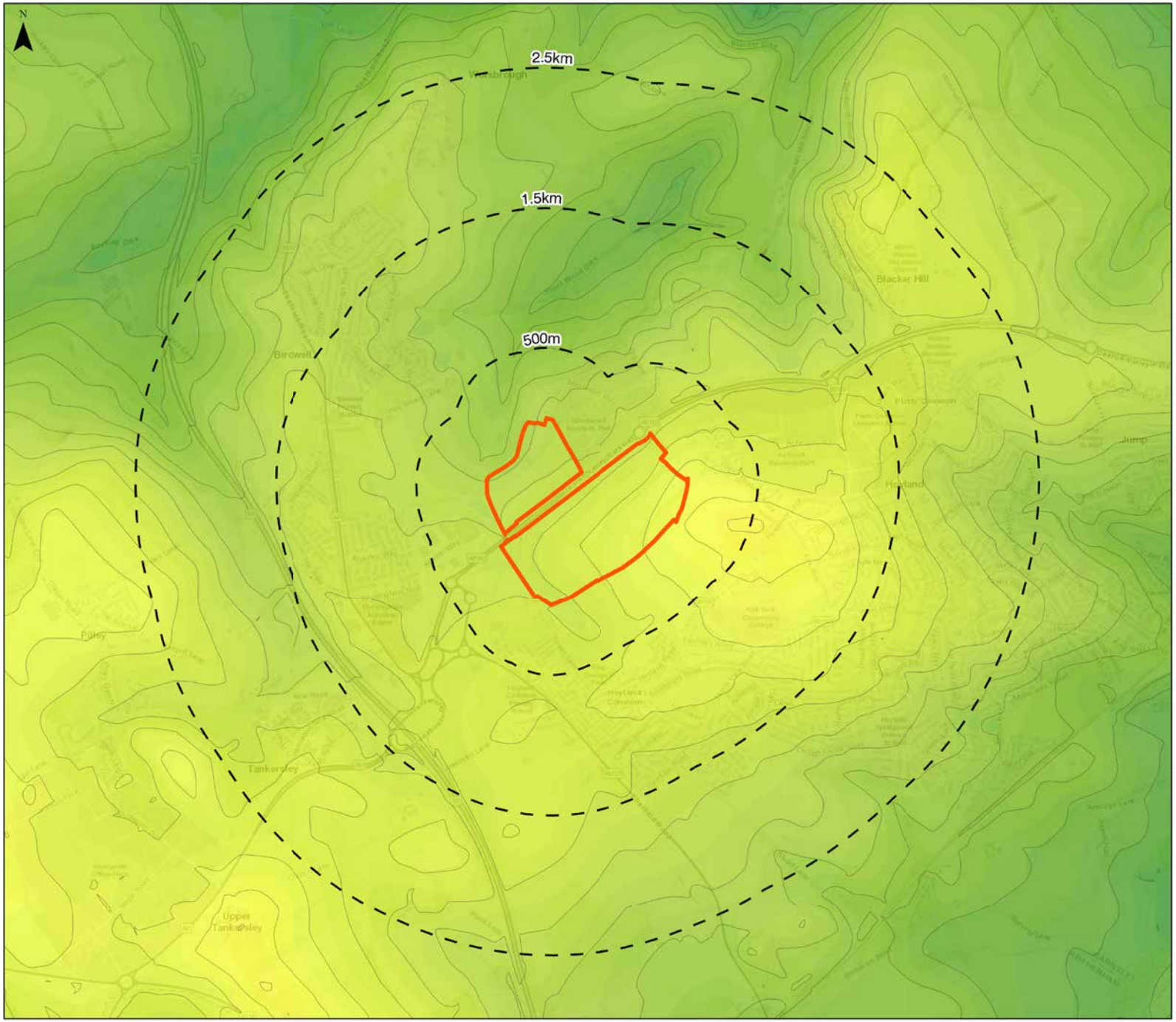
Barnsley , 14 JAN 20



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Proposed Site Boundary
10m Contours

≤30	≤120	≤220
≤35	≤125	≤225
≤40	≤130	≤230
≤45	≤135	≤235
≤50	≤140	≤240
≤55	≤145	≤245
≤60	≤150	≤250
≤65	≤155	≤255
≤70	≤160	≤260
≤75	≤165	≤265
≤80	≤170	≤270
≤85	≤175	≤275
≤90	≤180	≤280
≤95	≤185	≤285
≤100	≤190	≤290
≤105	≤195	≤295
≤110	≤200	≤300
≤115	≤205	≤305
	≤210	≤310
	≤215	≤315

URBAN WILDERNESS

335 - Figure 8.4 - Topography
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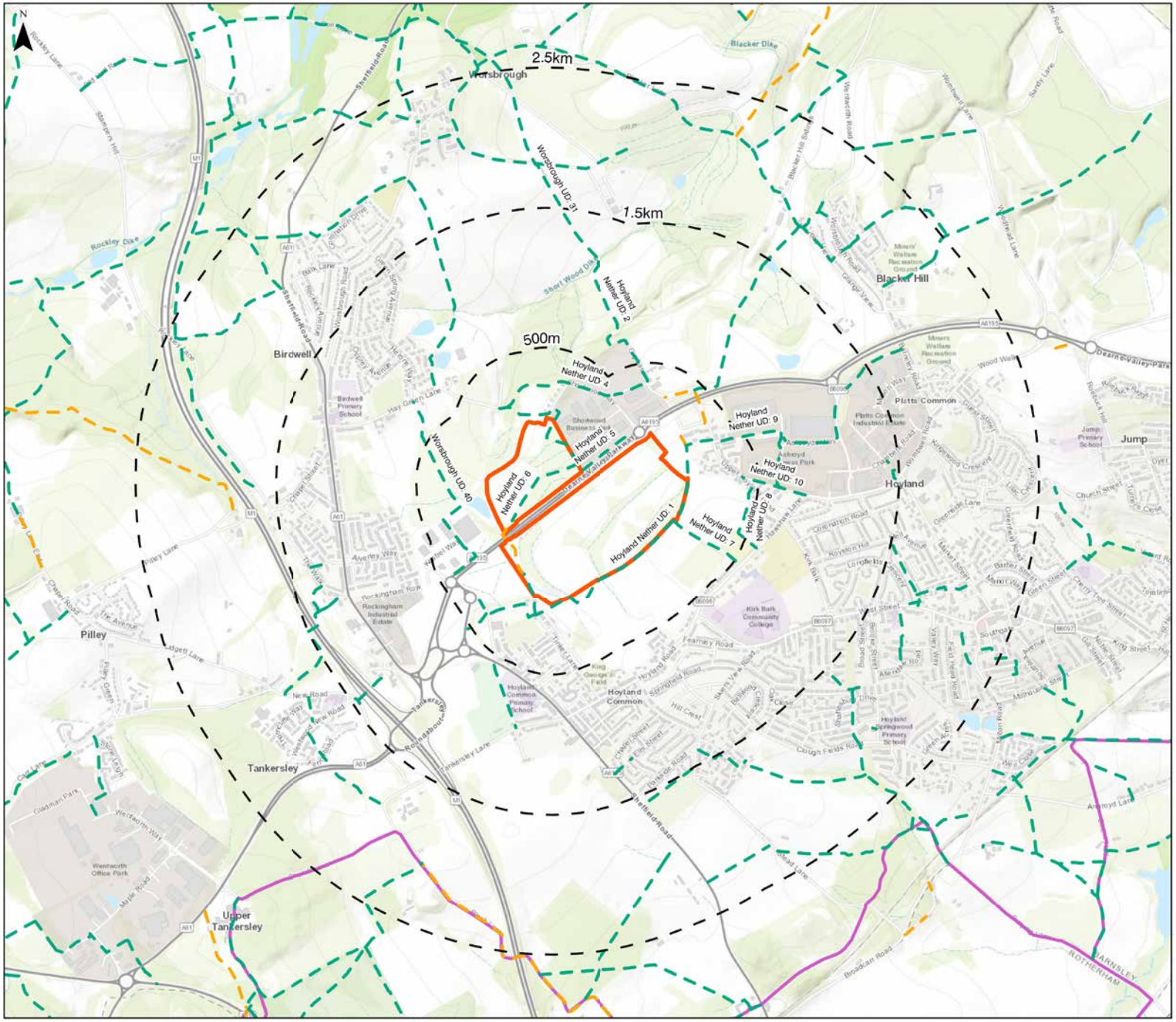
Barnsley , 14 JAN 20



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335 - Figure 8.5 - Public Rights of Way
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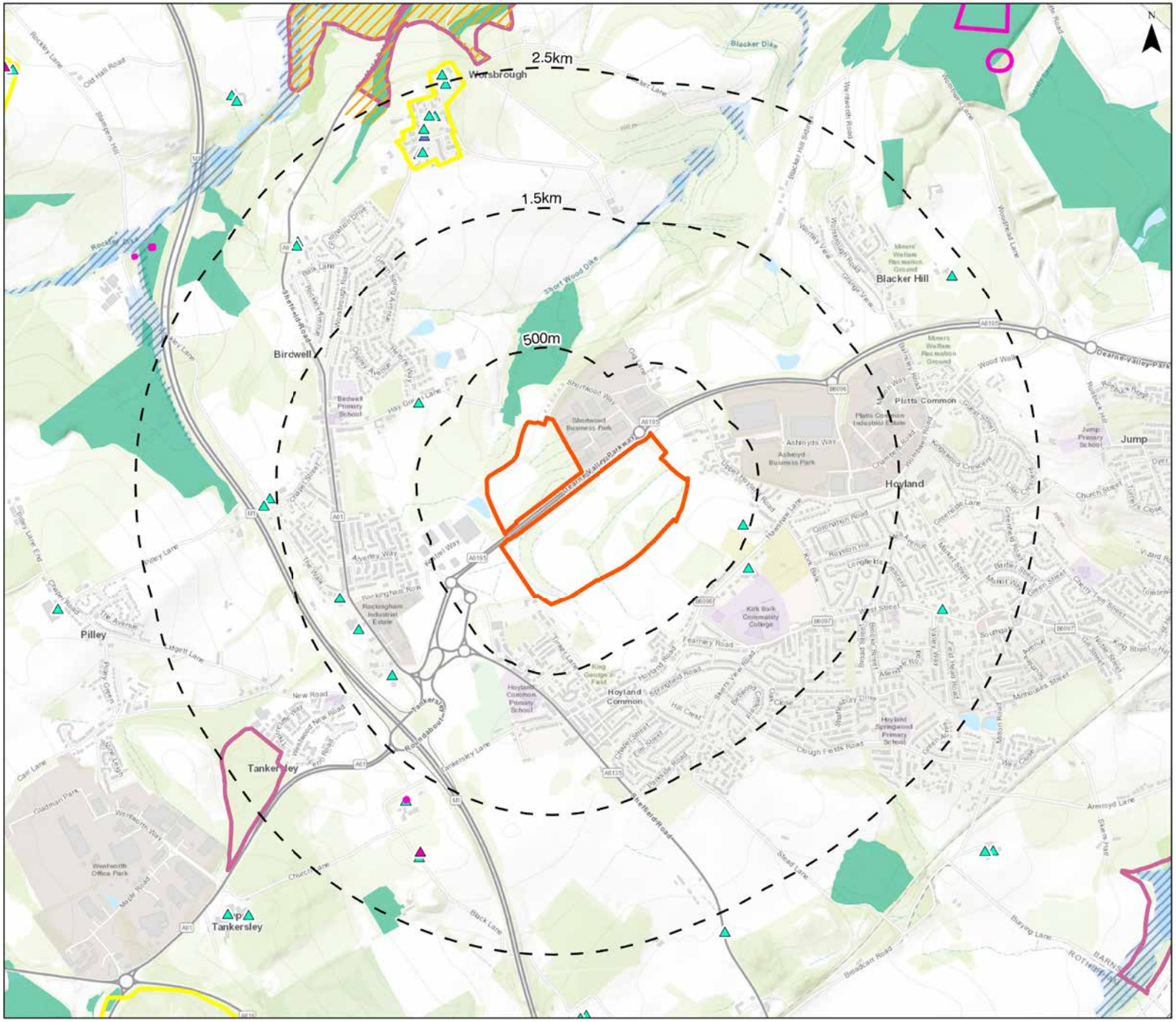

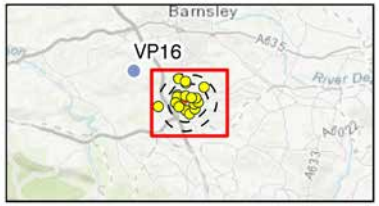

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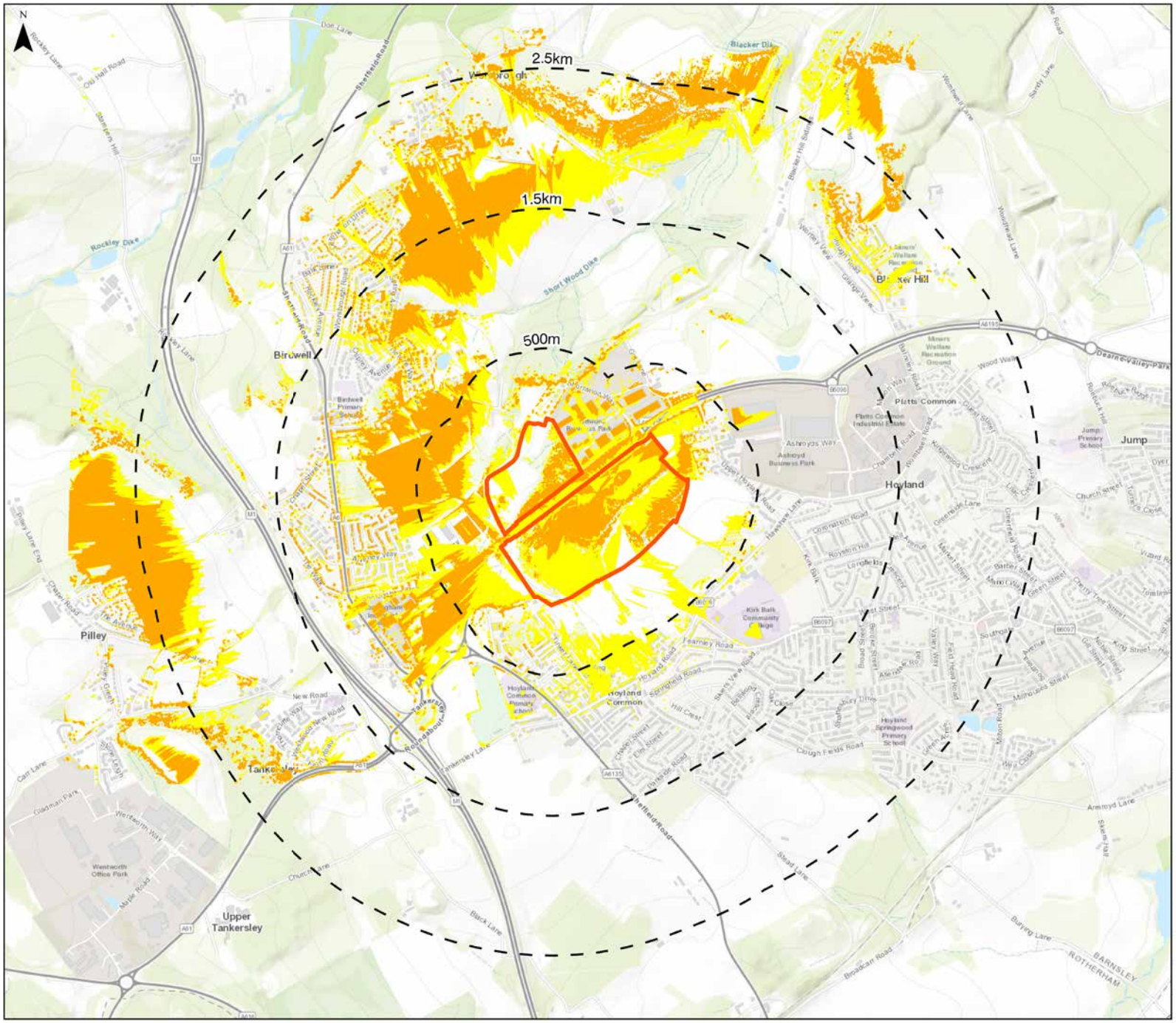
- Proposed Site Boundary
- Viewpoint 16
- Listed Building - Grade I
- Listed Buildings - Grade II
- Listed Buildings - Grade II*
- Conservation Areas
- Country Park
- Local Nature Reserves (LNR)
- Ancient Woodland
- Flood Zone 3
- Flood Zone 2
- Scheduled Monuments

URBAN WILDERNESS

335 - Figure 8.6 - Planning Designations

Dearne Valley Parkway, Gateway 36
Barnsley, 14 JAN 20



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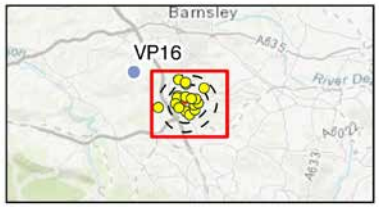
- Proposed Site Boundary
- ZTV - Not Visible
- ZTV - Partially Visible
- ZTV - Visible

URBAN WILDERNESS

335 - Figure 8.7 - Zone of Theoretical Visibility

Dearne Valley Parkway, Gateway 36
Barnsley , 14 JAN 20



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- Proposed Site Boundary
- Landscape Viewpoints
- Viewpoint 16

VP1: Viewpoint 1 - Residents in properties in Worsbrough Conservation Area
VP2: Residents in properties on Hay Green Lane and Herons Way
VP3: Users of PROW Worsbrough UD 40
VP4: Residents in properties on Lynham Avenue and the surrounding streets
VP5: Residents in properties on Tinker Lane and the surrounding streets
VP6: Residents in properties on Hoyland Road and the surrounding streets
VP7: Residents in properties on Hawshaw Lane
VP8: Users of PRoW Hoyland Nether UD 7 and 1
VP9: Residents in properties on Upper Hoyland Road (south)
VP10: Residents in properties in Upper Hoyland Rd (north)
VP11: Residents in properties of Shortwood Villas
VP12: Residential property at PRoW Worsbrough UD31#1
VP13: Users of PRoW Worsbrough UD31#1
VP14: Residents in properties in Blacker Hill
VP15: Residents in properties in Pilley
VP16: Visitors to Wentworth Castle Gardens
VP17: Road users of Rockingham Roundabout
VP18: Road users of Shortwood Roundabout

URBAN WILDERNESS

335 - Figure 8.8 - Viewpoint Location Plan

Dearne Valley Parkway, Gateway 36
Barnsley , 14 JAN 20

VIEWPOINT ONE

Location: St Mary's Gardens

Elevation: 108m AOD

Distance: 1.20 Km

Bearing to Site: Due South

Receptor Type: Residential

Viewpoint Description: Viewpoint taken to represent residents in properties within Worsbrough Conservation Area. Worsbrough is on the southern extent of Barnsley, with the properties on Worsbrough Road, Church Lane and St Mary's Gardens grouped as a receptor. These properties range in styles and compromise of single and double storey properties. Properties with front or rear aspect facing in a southward direction towards the site are the only properties in this location assumed to have views affected.

Extent of View to Site: This viewpoint is representative for the properties along Worsbrough Road, Church Lane and St Mary's Gardens. The majority of the properties along these streets will have limited to no views towards the proposed site, with properties aspects facing away from the proposed site, built form screening views or that many of these properties are single story and will not have elevated or expansive views.

Some views maybe apparent from the rear aspects of properties, more notable from 1st floor compared to ground floor with views across the intervening pastoral fields between the proposed site and viewpoint. The wooded area, Short Wood, and the undulating topography should screen the majority of the proposed site from view. Existing large warehouse units and already visible in this view.

Visibility of Proposed Development (Construction): Some construction activities may be apparent but these are anticipated to be from tall construction plant such as cranes. Other construction activities such as earth moving, contractor welfare facilities and parking, materials storage and plant movements within the site will be difficult to discern from this location.

Visibility of Proposed Development (Year 0): Some views maybe apparent but these will be limited in scale. As large warehouse are already present within the view, the additional of the proposed development would not alter the overall composition of the view. The proposed development could be seen as creating an extension of the industrial and commercial estates to the east and west of the proposed development.

Visibility of Proposed Development (Year 15): Any mitigation planting around the proposed site boundary will now be established and this will screen and filter views from this location towards the proposed development, which will reduce the visual impact of the scheme.

Type of View	Partial (Filtered)
Sensitivity to Change	High
Magnitude of Change	Medium adverse reducing to Low Adverse at year 15
Significance of Change:	Moderate adverse reducing to Slight Adverse at year 15

URBAN WILDERNESS

335 - Figure 8.9 - Viewpoint 1
Dearne Valley Parkway, Gateway 36
Barnsley , 14 JAN 20

VIEWPOINT TWO

Location: Hay Green Lane

Elevation: 118m AOD

Distance: 465m

Bearing to Site: Due South East

Receptor Type: Residential

Viewpoint Description: The viewpoint is taken to represent a group of residents in properties at Hay Green Lane, on the southern eastern corner of Birdwell. These properties range in style from single storey dwellings post war red brick properties to more traditional stone farmsteads and farm conversions consisting of stone. The majority of properties in this location have their rear or front aspect of the property facing towards the proposed site.

Extent of View to Site: Dry stone boundary wall with hedgerow vegetation stretches across the foreground. A farm building complex is seen to the right of the view. Electricity pylon with pylon lines transverse across the skyline are visually detracting features. In the middle ground, the agricultural land with intervening hedgerow vegetation slopes from right to left, towards an area of existing woodland on the lower part of the valley. In the background, a mature woodland belt (part of the proposed site) stretches across the elevated land. A landscape bund is a noticeable feature within the site. A large scale commercial warehouse (Gateway 36) to the east of the site is clearly visible in the background of the view. The woodland vegetation within the site is clearly visible from this view.

Visibility of Proposed Development (Construction): The removal of the wooded area within the proposed site would consist of a notable change to backdrop and skyline of the view. The majority of construction activities would be visible in the background of the view but would be at a distance where individual features would be difficult to perceive.

Visibility of Proposed Development (Year 0): The addition of the proposed development would be visible in the background of the view. The visual elements would be similar to the large commercial premises on the right of the viewpoint photography. The proposed development would not introduce new elements into the view due to the presence of similar existing commercial warehouses. The removal of vegetation and the additional of extra commercial units will visually merge the commercial premises to the east and west of the proposed site.

Visibility of Proposed Development (Year 15): By year 15 planting associated with the development along the southern site boundary would now be established and this would help to screen and filter views of the development. Upper storey of the commercial units would be visible but would be a less prominent features than in Year 1.

Type of View:	Partial
Sensitivity to Change	Medium (due to the existing visual impact of warehouses on adjacent site)
Magnitude of Change	Medium adverse
Significance of Change:	Moderate Adverse

URBAN WILDERNESS

335 - Figure 8.10 - Viewpoint 2
Dearne Valley Parkway, Gateway 36
Barnsley, 14 JAN 20

VIEWPOINT THREE

Location: UD40

Elevation: 118m AOD

Distance: 380m

Bearing to Site: Due South East

Receptor Type: Recreational

Viewpoint Description: The viewpoint is taken along PROW UD40, to represent users of recreation users of the PROW on the southern boundary of the village of Birdwell. This PRoW connects Birdwell to the A6195 and travels through farmland along field boundaries and through a commercial estate.

Extent of View to Site: The foreground composition consists of open pastoral fields separated by timber post and barb wire fencing with associated hedgerow vegetation. An electricity pylon at the centre of the view is a visually dominating and detracting feature. The middle ground consists of large scale open pasture separated by hedgerows and transversed by pylons. The open pasture and woodland vegetation of the proposed site sits on an elevated position behind a belt of mature woodland along the lower part of the valley. A group of large scale commercial buildings sit next to the proposed site, partially filtered by existing vegetation to the right of the view.

Visibility of Proposed Development (Construction) : Construction activities will be visible from this location in the mid distance. The removal of the wooded area within the proposed site will be a notable change in the view. The clearing of the woodland will make the majority of the construction activities a notable feature within the view. As the PRoW follows the undulating landform, views towards the site will be more substantial along higher parts of the route and the landform will screen lower areas.

Visibility of Proposed Development (Year 0): Once complete, the commercial units will be a notable feature within the field of view. Visually, they will merge with the commercial units to the east and west, creating a mass of premises along the skyline. The units in the southern section of the proposed site will be screened mainly by the units within the northern section of the site, although stacking of the roof elements will be apparent.

Visibility of Proposed Development (Year 15): Once mitigation planting becomes established, this should help soften and filter views to the proposed development, particularly tree planting on the northern section of the site. It is not anticipated that the full extent of the units will be screened through planting, however.

Type of View	Partial
Sensitivity to Change	Medium to High
Magnitude of Change	High adverse reducing to Medium adverse at year 15
Significance of Change:	Moderate Adverse

URBAN WILDERNESS

335 - Figure 8.11 - Viewpoint 3
Dearne Valley Parkway, Gateway 36
Barnsley , 14 JAN 20

VIEWPOINT FOUR

Location: Lynham Avenue

Elevation: 131m AOD

Distance: 390m

Bearing to Site: Due East

Receptor Type: Residential

Viewpoint Description: The viewpoint is taken from a gap between groups of residential properties on Lynham Avenue, to represent the views of the residents living in the area. The properties in this residential area consist of mainly post-millenium detached and semi-detached houses.

Extent of View to Site: The foreground is intervened by garden trees,hedging and timber fencing. A large scale commercial building complex is a dominating feature in right of the view, bounded by hedgerow vegetation which screens sections of the complex. The pastoral field in the mid distance are contained by dense boundary tree planting, separates the proposed site from this residential area. The woodland vegetation in the background (north of the proposed site) and the commercial complex screens the ground plane of the proposed sites from view.

Visibility of Proposed Development (Construction) : Sections of the northern edge of the site are visible from this location and therefore the construction activities within this area will also be visible. The overall visual scale of the construction activities will be limited from this location, although the removal of any vegetation will result in an alteration to the view.

Visibility of Proposed Development (Year 0): View from upper floors of the proposed development would be visible, but will be viewed as an extension of the existing commercial buildings to the right of the view. The majority of the properties in this area have their gable ends facing towards the site. This limits the visual impact of any views as windows along the side elevation of houses are limited compared to a house frontage or the rear aspect. Overall, the majority of the proposed development would be screened by the existing units and the proposed development would not be seen as a new element within the view, rather an extension to existing large commercial units.

Visibility of Proposed Development (Year 15): Mitigation planting along the northern boundary will help screen and filter views from this location of the development within the proposed scheme. Some aspects of the commercial units will still be visible.

Type of View	Partial
Sensitivity to Change	Medium to High
Magnitude of Change	Medium adverse reducing to Low adverse at year 15
Significance of Change:	Moderate Adverse reducing to Slight adverse at year 15

URBAN WILDERNESS

335 - Figure 8.12 - Viewpoint 4
Dearne Valley Parkway, Gateway 36
Barnsley , 14 JAN 20

VIEWPOINT FIVE

Location: Open space adjacent to Tinker Lane

Elevation: 143m AOD

Distance: 285m

Bearing to Site: Due North

Receptor Type: Residential

Viewpoint Description: The viewpoint is taken from a public open space adjacent to the back gardens of a line of bungalows to the north of Tinker Lane. It represents the views of the residents living in the area. This residential area comprises a mixture of 1970s bungalows, terraced houses, detached and semi-detached houses.

Extent of View to Site: The foreground view comprises of an open space with scattered vegetation, enclosed by a mixture of post and wire, timber fencing and boundary vegetation. The pastoral landscape gently rises towards the rear of the view, with open fields enclosed by hedgerow and transected by electricity pylons. Residential properties to the north of Hawshaw Lane, with intervening mature vegetation, are visible on the right of the view. Views towards the site are screened by dense woodland, which stretches across the south and south west boundaries of site and can be seen at the centre and left of the view. A grade II listed building, Hoyland Lowe Stand Tower, sits on an elevated piece of land among a group of trees and is visible to the right of the view in the background. Views towards the development would be partially screened/filtered by existing vegetation.

Visibility of Proposed Development (Construction): It is considered that the most obvious construction activity visible from this location would be created by the removal of vegetation within the proposed site. The majority of the construction activities would be screened by the localised landform and adjacent vegetation.

Visibility of Proposed Development (Year 0): Some aspects of the proposed development maybe visible from this location. These are anticipated to be rooflines or the top sections of the warehouse units. The overall scale and composition of the view would not be significantly altered by the development. The proposed units will be viewed therefore in the context of a landscape already characterised by a commercial and industrial building assemblage along the A6195.

Visibility of Proposed Development (Year 15): Mitigation planting around the proposed site boundary, once established, would help filter and screen views towards the proposed site. Some views of the development may be apparent from this location but would be limited to a small section of the application site. It is not anticipated, therefore, that the development will alter the overall composition of the existing view.

Type of View	Partial (Filtered)
Sensitivity to Change	High
Magnitude of Change	Low adverse
Significance of Change:	Slight adverse

URBAN WILDERNESS

335 - Figure 8.13 - Viewpoint 5
Dearne Valley Parkway, Gateway 36
Barnsley, 14 JAN 20

VIEWPOINT SIX

Location: Children's playground adjacent to King George V Playing Field

Elevation: 152m AOD

Distance: 416m

Bearing to Site: Due North

Receptor Type: Residential

Viewpoint Description: The viewpoint is taken from a children's playground to the south of King George V Playing Field and also represents the view experienced by residents living along the north of Hoyland Road. These properties are predominantly stone terrace dwellings, mixed with new-build infill dwellings.

Extent of View to Site: The foreground view comprises of a playing field, bounded by dense hedgerow vegetation and wire mesh fencing. A group of residential properties along Church View and Tinker Lane are visible in the mid-distance. Hoyland Dismantling area can be seen to the left of the image in the middle ground. A commercial complex next to the proposed site is visible behind the dismantling area. The proposed site is mostly screened/obscured by intervening vegetation and the undulating landform, leaving only the more elevated sections of the site visible.

The settlements of Birdwell, Worsbrough and Stainbrough are visible in the distant background, providing the surrounding urban context to the site. A long distance view of the Emley Moor transmitting station is visible to the left of the image.

Visibility of Proposed Development (Construction): The majority of the construction activities associated with the proposed site will be screened from this area by the intervening undulating landform and vegetation. The removal of the wooded area within the site will be notable but the intervening and surrounding wooded areas will result in less depth to the wooded area, not the complete removal from the view. Some tall construction plant could be visible above the line of vegetation but this anticipated to be limited in scale.

Visibility of Proposed Development (Year 0): When vegetation is not in leaf, it is anticipated that some filtered views could be visible to the proposed development. These will mainly be restricted to rooflines or upper floor windows of the proposed development. The majority of the proposed development will be screened by topography and existing woodland vegetation in the middle distance. Any views of the proposed development would not alter substantially the scale or composition of the existing view

Visibility of Proposed Development (Year 15): Any mitigation planting around the south western site boundary, would established would further filter and screen views from this location. Filtered views of the proposed development would remain but would not significantly alter the composition of the view.

Type of View	Partial (Filtered)
Sensitivity to Change	Medium
Magnitude of Change	Low adverse
Significance of Change:	Slight adverse

URBAN WILDERNESS

335 - Figure 8.14 - Viewpoint 6
Dearne Valley Parkway, Gateway 36
Barnsley , 14 JAN 20

VIEWPOINT SEVEN

Location: Pasture between residential properties along Hawshaw Lane

Elevation: 157m AOD

Distance: 300m

Bearing to Site: Due North

Receptor Type: Residential

Viewpoint Description: The viewpoint is taken from a gap between residential properties along Hawshaw Lane. This view represents views of residents living along the north of Hawshaw lane. The properties in this location consist of mainly detached houses and semi-detached houses with large, generous front and rear gardens with a mixture of residential boundary treatments (fencing, walls and hedging).

Extent of View to Site: The foreground of the image comprises a large field for grazing livestock, enclosed by hedgerow and post and wire fencing boundaries. Low voltage electricity pylons cross the field of view. The proposed site and its associated woodland vegetation sits on a lower ground plane in the middle distance, partially obscured by intervening landform.

This location affords long distance view across the surrounding hills at Stainborough are visible at the centre of the background. The settlements of Birdwell, Dodworth, Stainbrough and Silkstone Common are nestled within an undulating landscape, with intersecting layers of woodland vegetation and hedgerows, providing a semi-urban context to the site. A long distance view of the Emley Moor transmitting station is visible to the right of the image.

Visibility of Proposed Development (Construction): The majority of the site will be obscured by intervening topography, hedgerows and small belts of woodland. The removal of the vegetation within the construction stage would pose a significant change in view.

Visibility of Proposed Development (Year 0): It is anticipated that elements of the proposed scheme will be visible from this location. These will be the units in the southern section of the proposed scheme and which will screen the wider development from this location. The addition of the commercial units will have a further urbanising influence on what is largely a countrified view but it is anticipated that it will not alter the overall rural perception of the view.

Visibility of Proposed Development (Year 15): In year 15, mitigation planting along the southern boundary of the proposed site will help filter and screen views from this location. Some rooflines or upper sections of the proposed development may still be visible but restricted to the southern portion of the site.

Type of View	Partial (Filtered)
Sensitivity to Change	High
Magnitude of Change	Medium adverse reducing to Low adverse at year 15
Significance of Change:	Moderate adverse reducing to Slight adverse at year 15

URBAN WILDERNESS

335 - Figure 8.15 - Viewpoint 7
Dearne Valley Parkway, Gateway 36
Barnsley , 14 JAN 20

VIEWPOINT EIGHT

Location: PRoW Hoyland Nether UD 7 and 1

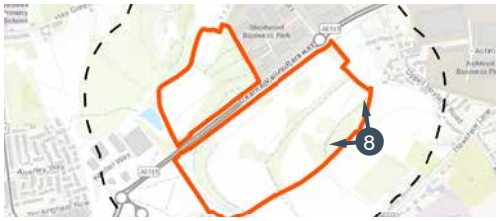
Elevation: 167m AOD

Distance: 10m

Bearing to Site: Due North

Receptor Type: Recreational

Viewpoint Description: The viewpoint is taken from PrOW UD 7 and 1, it represents the views of recreational users using theses PROW. Existing dense woodland vegetation along the southern boundary of the site screens the wider site from view, resulting in no views towards the northern part of the site (ES15). The Viewpoint is taken from the junction of PRoW 1 AND 7, PRoW 1 runs from Upper Hoyland Road to Tinker Lane and is a wide track, PRoW 7 connects into PRoW 1 and through to St Peter's Church in Hoyland.



Extent of View to Site: Planting along the southern boundary is visible in the foreground on the view, this planting screen wider views of the site and area. Views along these PRoW are channelled through the mature hedgerows which run along these routes.

Visibility of Proposed Development (Construction): Any removal of the vegetation within the visible southern section of the proposed site would represent a substantial change in the view, especially along PRoW 1 which runs the length of the southern site boundary. Removal of this vegetation would open up the previously screened view into the proposed site and landscape beyond. It is anticipated that some filtered views of the construction activities will be perceptible from this location but with views from this receptor being transient in nature.

Visibility of Proposed Development (Year 0): It is anticipated that the southern extent of the development could be visible from this location. Due to the landform and cut and fill required to accommodate the proposed commercial units into the landscape, the upper sections of these units and rooflines will be visible. The addition of the proposed development will be introducing a new elements from this viewpoint and removal of vegetation within the site will have a substantial effect on the composition of the view.

Visibility of Proposed Development (Year 15): By year 15, any mitigation planting along the southern boundary of the proposed site should now be established and this will largely screen the view towards the development. The development could remain partially visible, especially when deciduous vegetation is out of leaf but it is anticipated that these views would be limited.

Type of View	Partial
Sensitivity to Change	High
Magnitude of Change	Medium adverse reducing to Low adverse at year 15
Significance of Change:	Moderate adverse reducing to slight adverse at year 15

URBAN WILDERNESS

335 - Figure 8.16 - Viewpoint 8
Dearne Valley Parkway, Gateway 36
Barnsley , 14 JAN 20

VIEWPOINT NINE

Location: Pasture adjacent to residential properties along Upper Hoyland Road

Elevation: 180m AOD

Distance: 235m

Bearing to Site: Due North West

Receptor Type: Residential

Viewpoint Description: This viewpoint is taken adjacent to Hoyland Lowe Stand Tower, on a pasture adjacent to the back gardens of a line of residential properties along Upper Hoyland Road. The row of properties in this location consists of mainly two-storey detached and semi-detached houses with long front and back gardens built on a slope.

Extent of View to Site: The foreground view comprises of a broad open field used for grazing, with a corner of a local burial ground surrounded by a stone wall to the left of view. Low voltage electricity pylons cross the field which is enclosed by hedgerow. The existing woodland within the proposed site is visible on lower ground in the middle distance, though partially obscured by intervening landform. The Rockingham Row Industrial estate and the commercial complex adjacent to site ES15 are partially obscured by woodland vegetation within the site boundary. Shortwood business park is largely concealed by intervening topography and filtered by vegetation, with only the roofscape discernible in view.

Open wider views of the surrounding hills at Stainborough are visible in the background to the right of the view. Birdwell and surrounding settlements are nestled in an undulating landscape, transected by layers of vegetation and hedgerows, providing a rural urban-edge context to the view.

Visibility of Proposed Development (Construction): The removal of the woodland in the proposed site will pose a notable change in the mid distance of the view. Removal of this vegetation will open-up previously screened views towards the existing commercial estates along the A6195. From this elevated location, the scale of the removal of vegetation will be most noticeable compared with other locations studied within this report. Once the vegetation has been removed, large areas of construction activity will be visible from this location. It is anticipated that localised steep landform between the residential properties along the Upper Hoyland Road and proposed site will screen some views towards the site and the construction activities within.

Visibility of Proposed Development (Year 0): The majority of the proposed scheme is thought to be visible in the mid distance of the view. The proposed development will not introduce a new element into the extent of the view but it will create a larger mass of commercial development along the A6195, and therefore these units will become more predominant in the view. The addition of the proposed development will bring the core of commercial properties closer to sensitive residential receptors in this area.

Visibility of Proposed Development (Year 15): Mitigation planting along the site boundary will help screen and filter views of the proposed development from this location. Planting around the site boundary will help the development 'bed' into the landscape and to mitigate against the massing or the perceived merging of the commercial developments along the A6195.

Type of View	Partial
Sensitivity to Change	High
Magnitude of Change	Medium adverse reducing to Low adverse at year 15
Significance of Change:	Moderate adverse reducing to slight adverse at year 15

URBAN WILDERNESS

335 - Figure 8.17 - Viewpoint 9
Dearne Valley Parkway, Gateway 36
Barnsley, 14 JAN 20

VIEWPOINT TEN

Location: Residents in properties on upper Hoyland Road (north)

Elevation: 145m AOD

Distance: 135m

Bearing to Site: Due West

Receptor Type: Residential

Viewpoint Description: This viewpoint is taken from a cul-de-sac of Upper Hoyland Road, close to the Shortwood Roundabout and is representative of the views of local residents. The building character to the south of the cul-de-sac consists of large detached stone dwellings with in-built garages and well maintained gardens enclosed by drystone walls. Recent development to the north of the cul-de-sac and adjacent to Dearne Valley Parkway are cladded with masonry stone, generally in keeping with the built character of the existing properties but have smaller front gardens.

Extent of View to Site: The foreground comprises of tall mature hedgerow which screens the undulating farmland behind. The roofscape of Shortwood Business Park is visible behind the hedgerow in the middle ground. The existing woodland block along the eastern boundary of site ES17, in combination with the tree belt surrounding Shortwood roundabout, largely obscures the ground plane of the proposed site from this viewpoint. The south east residential areas of Birdwell and the surrounding fields to the north west of the proposed site ES15 are visible in the background of the image.

Visibility of Proposed Development (Construction): Some aspects of the construction activities within the site will be visible from this location but sections will be screened by the tall hedgerows. Views from upper floor windows will give a clearer view across to the southern section of the site and therefore the construction activities within this area.

Visibility of Proposed Development (Year 0): It is anticipated the roofscapes of the proposed development at ES15 would be visible from this location replacing the existing woodland block within the site boundary. However, the development would not be introducing a new element into the view with existing views towards commercial estates. The development would serve to bring these elements into a far closer proximity to receptors identified. It is anticipated that the units to the eastern edge of the scheme would screen the wider proposals.

Visibility of Proposed Development (Year 15): Planting on the eastern extent of the southern section of the proposed development would help screen and filter views from this location towards the proposed site. Some aspects of the development would still be visible, such as upper storeys and rooflines, partially from elevated 1st floor windows.

Type of View	Partial
Sensitivity to Change	Medium
Magnitude of Change	Medium adverse reducing to Low adverse at year 15
Significance of Change:	Moderate adverse reducing to slight adverse at year 15

URBAN WILDERNESS

335 - Figure 8.18 - Viewpoint 10
Dearne Valley Parkway, Gateway 36
Barnsley, 14 JAN 20

VIEWPOINT ELEVEN

Location: Shortwood Villa

Elevation: 122m AOD

Distance: 40m

Bearing to Site: South West

Receptor Type: Residential

Viewpoint Description: This viewpoint is taken from an end of a drive at Shortwood Villa. The residential properties range in styles and compromise of mainly double storey properties with garage extensions. Only the property situated at the western extent of the road would have a view towards the site in a southward direction. Other properties along the minor road would have limited heavily filtered views towards the site as they are fronting towards a woodland belt adjacent to Shortwood Business Park.

Extent of View to Site: The foreground comprises of a field gate which marks the end of the drive at Shortwood Villa. The left of the image is defined by a line of mature hedgerow and trees which partially screen views towards the existing woodland within site ES15. In the middle distance, timber board fencing marks the garden boundary of the property at the end of the drive, with low voltage power lines crossing the skyline. The foreground pasture and woodland planting of the proposed site ES15 is in view beyond the garden fence. A commercial complex is visible at the centre of the site above a strip of landscape bunding and tree belt in the background.

Filtered views of the proposed pond and associated landscape features at site ES15 would be visible behind the proposed woodland block in the foreground. Partial views of Unit 2 and its rooflines would be available behind a belt of proposed woodland planting.

Visibility of Proposed Development (Construction): Within the visible northern section of the proposed development, construction activities will be visible. The removal of vegetation within the site will pose noticeable change in the background view. The area within the proposed site which is closest to this location is allocated for a pond, so earthworks in this location will likely be visible.

Visibility of Proposed Development (Year 0): It is anticipated that the larger unit within the northern section (Unit 2) would be visible in this location. The majority of the proposed development would be screened by the intervening woodland and the proposed commercial units in the northern section of the site. The proposed development would not be introducing a new element into the view, and would likely be seen as an extension of the commercial units to the west of the proposed development.

Visibility of Proposed Development (Year 15): Mitigation by way of woodland planting around the northern boundary of the proposed site would help to screen and filter views from this location. Rooflines and upper sections of the proposed commercial units would still be visible but it is anticipated that the scale and mass of the development would be largely mitigated. The southern section of the proposed development would be screened by commercial Unit 2.

Type of View	Partial
Sensitivity to Change	Medium to High
Magnitude of Change	Medium adverse reducing to Low adverse at year 15
Significance of Change:	Moderate adverse reducing to slight adverse at year 15

URBAN WILDERNESS

335 - Figure 8.19 - Viewpoint 11
Dearne Valley Parkway, Gateway 36
Barnsley, 14 JAN 20

VIEWPOINT TWELVE

Location: PRoW Worsbrough UD31 (Hoyland Brook)

Elevation: 101m AOD

Distance: 1.07km

Bearing to Site: South West

Receptor Type: Residential

Viewpoint Description: This viewpoint is taken to represent an isolated residential property, which lies north of the proposed site and named Hoyland Brook. The public footpath PRoW Worsbrough UD31 runs along the edge of the property continuing to the south into an arable field, (Viewpoint 13). The properties frontage faces south west and would have gable-end views of the proposed site.

Extent of View to Site: The foreground of the viewpoint consists of an arable fields, sloping south towards the valley of Short Wood Dike. Electricity pylons and wires traverse across the fields in the middle ground. The mature dense woodland of Short Wood dominates the middle ground, which is designated as Ancient and Semi-Natural Woodland. The top of this wooded valley edges the woodland belt of a dismantled railway and the northern boundary of the proposed development site ES15. The rooftops of shortwood Business Park is visible above the dense woodland vegetation to the left in the middle distance. The commercial development of Gateway 36 is visible on the horizon in the middle of the viewpoint, with rooflines of Birdwell continuing to the right. The grade listed buildings of Hoyland Lowe Stand and St Peters Spire are visible on the horizon in the far left of the viewpoint.

Visibility of Proposed Development (Construction): The removal of the vegetation within the proposed site may have a slight impact of the perceived level of woodland on the horizon. It is however unlikely that the majority of construction activities related to the proposed scheme would be visible from this location. Tall construction plant such as cranes could be visible but these impacts will be temporary and limited in impact.

Visibility of Proposed Development (Year 0): Compartment ES15 sits behind Short Wood in the middle of the viewpoint and the development would potentially be visible, as the topography of the compartment continues to rise up from Short Wood. Compartment ES17 sits above the current tree line of Short Wood and Shortwood Business Park roofline to the left of the viewpoint. As the landform within ES17 rises from the existing tree line of Short Wood, the proposed development will become more visible, with rooflines and upper floors emerging above the current horizon of trees.

Visibility of Proposed Development (Year 15): Mitigation planting around the proposed site boundary would have been established by this time and would screen and filter views towards the site. Some rooflines and upper storeys will still be visible but this would not introduce new elements into the view but rather appear as an extension of the existing commercial premises. It is not anticipated that the scale and composition of the view would substantially alter by year 15.

Type of View	Partial
Sensitivity to Change	High
Magnitude of Change	Low adverse
Significance of Change:	Slight adverse

URBAN WILDERNESS

335 - Figure 8.20 - Viewpoint 12
Dearne Valley Parkway, Gateway 36
Barnsley, 14 JAN 20

VIEWPOINT THIRTEEN

Location: PRoW Worsbrough UD31

Elevation: 93m AOD

Distance: 940m

Bearing to Site: South West

Receptor Type: Recreational

Viewpoint Description: This viewpoint is taken to represent the users of PRow Worsbrough UD31, which lies north of the proposed site. The public footpath runs along the field margins of arable fields and through the western extent of Short Wood, connecting into Hoyland Nether UD 2. Viewpoint photography was taken at a higher point along the route to allow for an elevated view towards the site. In lower parts along the route, the site fill be screened by vegetation within Short Wood.

Extent of View to Site: The foreground of the viewpoint consists of arable fields, sloping south towards the valley of Short Wood Dike. Low voltage power lines cross the fields in the middle ground. The mature dense woodland of Short Wood dominates the middle ground, which is designated as Ancient and Semi-Natural Woodland. The top of this wooded valley adjoins the woodland belt of a dismantled railway and the northern boundary of the proposed development site ES15. The rooftops of Shortwood Business Park are visible above the dense woodland vegetation to the left of view in the middle distance. Grade II listed buildings of Hoyland Lowe Stand and St Peters Spire are visible on the horizon in the far left of view. The commercial development of Gateway 36 is visible also on the horizon in the middle left of the view, with rooflines of Birdwell continuing to the right.

Visibility of Proposed Development (Construction): The majority of the construction activities will be screened by the intervening vegetation and landform. The removal of vegetation along the skyline will have a thinning effect on the wooded horizon. Tall construction plant such as cranes could be visible but these impacts will be temporary and limited in impact.

Visibility of Proposed Development (Year 0): The proposed site ES15 sits on the brow of a hill, behind the treeline of Short Wood in the middle distance. The rooftops of the development would be visible and be seen as an extension to Shortwood Business Park. Compartment ES17 sits above the current tree line of Short Wood and roofline Shortwood Business Park to the left of the viewpoint. The buildings and associated landscape of proposed development ES17 would be visible in the background and replaces the existing strip of vegetation on the horizon, with enhanced visibility during the winter when vegetation is not in leaf.

Visibility of Proposed Development (Year 15): Mitigation planting in Year 15 will now be established and will help to screen and filter views towards the proposed development. Some views of rooflines and upper storeys of the proposed development could be visible but the overall scale and mass of the proposed development would be largely mitigated from viewed from this location.

Type of View	Partial
Sensitivity to Change	High
Magnitude of Change	Low adverse
Significance of Change:	Slight adverse

URBAN WILDERNESS

335 - Figure 8.21 - Viewpoint 13
Dearne Valley Parkway, Gateway 36
Barnsley, 14 JAN 20

VIEWPOINT FOURTEEN

Location: Grange View

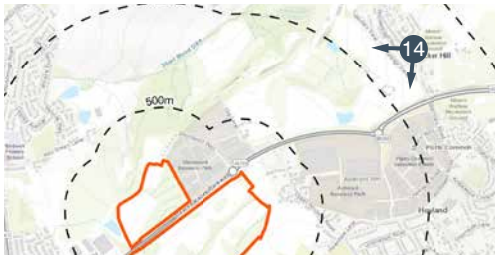
Elevation:127m AOD

Distance: 1.085km

Bearing to Site: North East

Receptor Type: Residential

Viewpoint Description: The viewpoint is taken to represent the views for residents in the properties within Backer Hill, which lie to the north east of the proposed development. The properties in this location consist of mainly semi-detached, double storey properties and single storey bungalows. Properties with front and rear aspects along Grange View and Wortley View have views towards the site in a south-east direction.



Extent of View to Site: The foreground view is of agricultural fields with some low voltage power transmission crossing the field of view. The foreground contains an agricultural barn in Blacker Dike. The middle view comprises of a rolling patchwork of fields enclosed by mature hedgerow, boundary trees and wooded dikes. Short Wood Dike is located to the right the viewpoint in the valley. To the far left of view, the commercial development on Ashroyds Business Park is visible on elevated ground. To the far left, the A6195 is mostly screened by its vegetated edge. At the back right of the view, the urban edge of Birdwell and Worsbrough are visible.

Visibility of Proposed Development (Construction): Due to intervening landform and vegetation, it is anticipated that there will be no view of construction activity from this location. Views will be afforded from upper storey windows but these will be characterised within the context of surrounding commercial development and at over 1km away, at a distance which would render the development difficult to distinguish from adjacent warehousing.

Visibility of Proposed Development (Year 0): From this viewpoint, the proposed site is currently screened by elevated landform, vegetation along the A6195 and the existing buildings of Ashroyds Business Park. Shortwood Business Park adjacent to ES15 which sits at an elevated level in comparison to the compartment ES15, is not visible from this viewpoint.. Any potential views afforded from upper storey windows would be seen within the context of the surrounding commercial development and at a distance unlikely to experience a substantial magnitude of change.

Visibility of Proposed Development (Year 15): Due to intervening landform and vegetation, it is anticipated that there will be little, if any view of the proposed development. Any views afforded from upper floors of residential properties would be further screened by established mitigation planting along the site boundary.

Type of View	Partial
Sensitivity to Change	High
Magnitude of Change	Low adverse reducing to negligible in year 15
Significance of Change:	Negligible

URBAN WILDERNESS

335 - Figure 8.22 - Viewpoint 14
Dearne Valley Parkway, Gateway 36
Barnsley , 14 JAN 20

VIEWPOINT FIFTEEN

Location: Pilley Lane

Elevation: 147 AOD

Distance: 1.55km

Bearing to Site: West

Receptor Type: Residential

Viewpoint Description: This view is representative of the views experienced by residents living in properties along the eastern side of Pilley. The properties in this location consist of mainly semi detached, double storey and single storey properties. Dwellings along Rockley View and The Avenue have a view of the site from the rear of their properties. This location affords a view across arable fields, the M1 road corridor and the village of Birdwell in the middle ground, up to the Application Site and Hoyland in the background.

Extent of View to Site: The foreground view comprises of an arable field which is edged by mature hedgerow, which conceals the M1 located in the lower valley. The middle ground comprises residential properties in Birdwell and the industrial buildings of the local Business Parks. From left to right this includes Shortwood Business Park to the far left, the roofline of Ackroyd Business Park, the buildings of Gateway 36 in the middle of the view and the industrial buildings at Rockingham Industrial Estate lying behind the Birdwell Obelisk (Grade II listing) located to the right of view.

The proposed development site lies behind the village of Birdwell in the centre of view. ES15 sits in between Shortwood Business Park to the left and Gateway 36. Meanwhile, the ES15 woodland breaks up the built edge along the A6195. ES17 sits on an elevated slope which rises up to Hoyland, where the existing woodland belts and fields visually separate the built-up areas of Birdwell in the middle ground, Blacker Hill to the top left and Hoyland Common to the top right. In the background, on the horizon lies Hoyland, with visible landmarks of Hoyland Lowe Stand and St Peter's Church spire (Grade II listing).

Visibility of Proposed Development (Construction): The removal of vegetation will be a notable change in the view from this location and will be seen as a loss of wooded character within the backdrop of the view. Construction activities will be visible but will be at a distance where individual features or activities would be difficult to discern.

Visibility of Proposed Development (Year 0): Compartment ES17 dominates the central background of this viewpoint. The development will be visible due to the site being located on the elevated slope, rising up to Hoyland. Development of compartment ES15 will be partially screened by dwellings in Birdwell. The woodland compartment of ES15 currently breaks up the industrial development on the A6195, so the development will have an urbanising effect on the view by continuing development along the road corridor.

Visibility of Proposed Development (Year 15): Mitigation planting, once established will help screen and filter views from this location. However, the proposed commercial units will still be partially visible and the development will dominate the centre of view, with these large units appearing stacked together from this viewpoint. Mitigation planting will serve to reduce the visual impact of the proposed development from this location.

Type of View	Partial
Sensitivity to Change	High
Magnitude of Change	Medium adverse reducing to Low adverse at year 15
Significance of Change:	Moderate adverse reducing to slight adverse at year 15

URBAN WILDERNESS

335 - Figure 8.23 - Viewpoint 15
Dearne Valley Parkway, Gateway 36
Barnsley, 14 JAN 20

VIEWPOINT SIXTEEN

Location: Footpath in grounds of Wentworth Castle Gardens, in front of Northern College

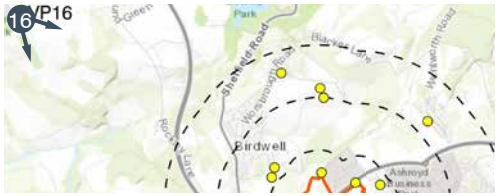
Elevation: 155 AOD

Distance: 3.75km

Bearing to Site: South west

Receptor Type: Recreational

Viewpoint Description: Wentworth Castle is a Grade I country house in Stainborough, South Yorkshire. The view is taken from the footpath that connects the Long Barn Visitor Centre to the Corinthian Temple, looking in a south west direction. The Wentworth Castle Gardens are located to the west of the Northern College Building. Wentworth Castle gardens are a partnership between Barnsley Council, Northern College and the National Trust. It is South Yorkshire's only Grade I registered landscape, with acres of parkland and gardens.



Extent of View to Site: Views towards the site are mainly from the Parkland to the north of the Northern College. Views are across undulating wooded areas, farmland and urban combinations. Distant views towards the site are afforded from this elevated view but features and elements are difficult to perceive from this distance. The surrounding commercial premises of Rockingham Business Park and Junction 36 are visible, with the cladding on the units reflecting the sunlight, making the unit more visible in the viewshed. The Rotunda is located in the central aspect of the views with a backdrop of woodland planting.

Visibility of Proposed Development (Construction): From this distance seeing individual features and elements within the construction activities would be difficult to perceive. The loss of wooded area during the construction phase would be visible but would not alter the composition or balance of the existing expansive view.

Visibility of Proposed Development (Year 0): The proposed development will be visible in the distance from this location. Individual features and aspects would be difficult to determine due to the distance but there would be a perceptible increase of massing where the new development would be joining the Shortwood Business Park and the Junction 36 Area. The large Unit 2 visually would be the most notable unit and would screen aspects of the wider development from view. The proposed development would be visible. However, visual effects will be limited due to the existing urbanising features within the view and the distance from the proposed site.

Visibility of Proposed Development (Year 15): Once established, mitigation planting in the northern section of the proposed development and between the two developments parcels along the A6195 will help screen and filter views from this location. It will also limit the perceived cumulative spread of warehouses across the visual field. It is anticipated. It is anticipated that some aspects of the proposed development would be visible, mainly upper stories and rooflines. Mitigation planting around the existing developments (Junction 36 and Shortwood Business Park) is limited thus the existing warehouses serve to reduce the quality of the visual resource from this viewpoint. The new development should be seen within this diminished visual context. It is considered, therefore, that the building design coupled with the structure planting, will serve to make the proposed development less visible in the long term compared to the adjacent sites. The mitigation strategy of the proposed development will temper visual impacts through screening and filtering the view from this location.

Type of View	Partial
Sensitivity to Change	High
Magnitude of Change	Low adverse
Significance of Change:	Slight adverse

URBAN WILDERNESS

335 - Figure 8.24 - Viewpoint 16
Dearne Valley Parkway, Gateway 36
Barnsley , 14 JAN 20

VIEWPOINT SEVENTEEN

Location: A6195 Rockingham Roundabout

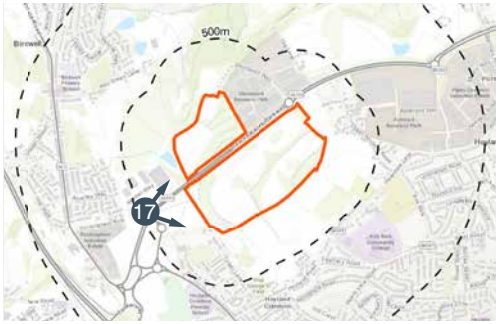
Elevation: 133m AOD

Distance: 350m

Bearing to Site: South west

Receptor Type: Vehicular and road users

Viewpoint Description: This viewpoint is taken from the footpath on Rockingham Roundabout on the A6195 / Dearne Valley Parkway, to represent vehicular and other road users. Rockingham Roundabout currently provides access to the recent development at Gateway 36, some of which remain under construction (December 2019).



Extent of View to Site: The foreground consists of the roundabout and its associated infrastructure of the dual carriageway. In the middle ground the commercial buildings of Gateway 26 along the northern extent of the A6195 (Deane Valley Parkway), are sited at lower levels than the road. The A6195 continues into the far distance to the east and the tree-lined edge of ES17 and the adjacent plot gently rises up on the right. Compartment ES15 sits behind the Dearne Valley Farm public house on the left and ES17 on the right.

Visibility of Proposed Development (Construction): Construction will be partially screened by existing vegetation between Gateway 36 and ES15, and also the vegetation adjacent to the west of ES17. Notable changes will include removal of boundary vegetation which currently screens the site, replaced with site hoardings. Construction on ES17 will be more visible in comparison to ES15, due to the sites rising topography. Overall construction activities will be broadly in keeping within an area dominated by large road infrastructure and commercial activity.

Visibility of Proposed Development (Year 0): Once complete the commercial units will be a notable feature within the view, particularly those in ES17. The units of ES15 will be partially screened and merge with the buildings within the Junction 36 development. Unit 2 of ES15 is the largest of all units proposed and will be visible along the sightline of the A6195. Units in ES17 will be visible along the site boundary edge and from the A6195 in both directions. The proposed development incrementally increase the amount of commercial development within the area and within this specific viewpoint. However, the sensitivity is already reduced due to the existing urbanising influences. It is anticipated therefore that the development will reduce the visual resource further and create a further urbanisation of the road corridor.

Visibility of Proposed Development (Year 15): Once mitigation planting has established, this should soften and filter views of the proposed development, particularly planting on the northern and western boundary of ES17. However, it is not expected that planning will screen the extent of the site. The view will have an increased urbanised context but development would be seen in the context of the surrounding existing commercial premises. Views from road users will be transient in nature.

Type of View	Partial
Sensitivity to Change	Low
Magnitude of Change	Medium adverse
Significance of Change:	Moderate adverse reducing to slight adverse at year 15

URBAN WILDERNESS

335 - Figure 8.25 - Viewpoint 17
Dearne Valley Parkway, Gateway 36
Barnsley , 14 JAN 20

VIEWPOINT EIGHTEEN

Location: A6195 Shortwood Roundabout

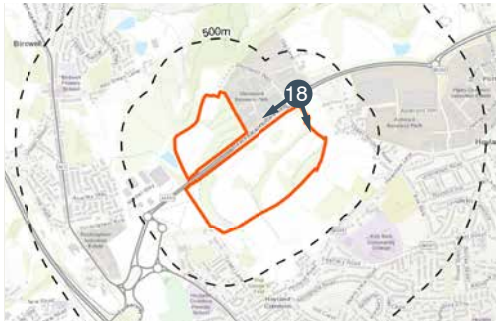
Elevation: 136 AOD

Distance: 60m

Bearing to Site: North east

Receptor Type: Vehicular road users

Viewpoint Description: This viewpoint is taken from the footpath on Shortwood Roundabout on the A6195 / Dearne Valley Parkway, to represent vehicular and road users. Shortwood Roundabout currently provides access to Shortwood Business Park and is the proposed new access point for compartment ES17.



Extent of View to Site: The foreground composition consists of the roundabout, leading onto the A6195 duel carriageway, heading west towards the M1 junction 36. A footpath continues around the roundabout leading into Shortwood Business Park. Streetlights line the roundabout and continue along with the central reservation of the road. The middle ground consists of immediate views into the proposed site compartment ES17 to the left, the woodland compartment of ES15 and rooftops of Gateway 36 are in the centre of the view, with the roofline of buildings in Shortwood Business Park to the right. The village of Birdwell can be seen on the horizon to the right.

Visibility of Proposed Development (Construction): Construction in compartment ES17 will be most visible from this viewpoint, compartment ES15 will be partially screened by the existing landform, roofline and vegetated screening of Shortwood Business Park. Notable changes to the view will include site hoardings, new access tracks on to the site and vegetation clearance in ES17. Anticipated increased heavy vehicles for construction will not be out of keeping with current use of the A6195 and adjacent business parks.

Visibility of Proposed Development (Year 0): Once complete, units 1, 2 and 3 within compartment ES17will be particularly visible from this viewpoint. The remaining units will be partially screened by the forefront buildings and the planned lowered embankment of units. The proposed development will be seen in the context of the existing commercial business parks along the A6195 currently visible. The development will have an increased urbanising effect on the view but will not be introducing unfamiliar elements or features. Views from road users will be transient in nature.

Visibility of Proposed Development (Year 15): Mitigation planting around the boundary of the site once established, will screen and filter views into the site, reducing the visual impact of the scheme particularly of ES17. Upper floors and rooflines will remain visible above the mitigation planting. The development will increase the sense of urbanisation but will not introduce incongruous elements or features within the view. Views from road users will be transient in nature.

Type of View	Partial
Sensitivity to Change	Low
Magnitude of Change	Medium adverse reducing to Low adverse at year 15
Significance of Change:	Slight adverse

URBAN WILDERNESS

335 - Figure 8.26 - Viewpoint 18
Dearne Valley Parkway, Gateway 36
Barnsley , 14 JAN 20

Figure from: Hoyland North Masterplan Framework, Public Consultation Boards, displayed 5 August 2019 to Tuesday 17 September 2019. Available from WYG website

URBAN WILDERNESS

335 - Figure 8.27 - Hoyland North Masterplan Framework – Option B
Dearne Valley Parkway, Gateway 36
Barnsley , 14 JAN 20

11. Landscape and Environmental Management Plan

LANDSCAPE STRATEGY

The landscape and ecological plan sets out the principles for the landscape design and has been developed with consideration to the mitigation measures identified within the LVIA and the consultant ecologist.

The plan incorporates substantial belts of vegetation to improve screening from sensitive receptors and the assimilation of the proposed development within the broader study area. A connected range of vegetation types, proposed by the ecologist, seek to promote the ecological value of the site.

Vegetative screening to the boundary edges and at strategic locations within the site will limit views of the site from sensitive receptors and viewpoints. While this new woodland planting will not create a total screen, it will create a layering effect, with new woodland areas adding to the sequence of urban and landscape features along the existing urban edge of Barnsley and Hoyland. This will include screening along the boundary edges of the A6195 which will reduce views from the road and between development parcels ES15 and ES17. New screening on the southern, western and eastern boundary on the embankment will reduce visual permeability for residents in Hoyland Common and Hoyland. Supplementary boundary planting in ES15 along Short Wood will also buffer the ancient woodland.

INDICATIVE PLANT SCHEDULE

The following list represents an indicative plant schedule developed by the ecologists of the intended planting within the application boundary. The detailed planting proposals will be developed from the selection below.

Woodland: Broad-leaved plantation

Botanical Name	Common name
Alnus glutinosa	Alder
Fraxinus excelsior	Ash
Populus tremula	Aspen
Betula (pendula/ pubescens)	Birch (Silver or downy)
Prunus padus	Bird cherry
Prunus spinosa	Blackthorn
Frangula alnus	Buckthorn (alder)
Cytisus scoparius	Scotch broom
Malus sylvestris	Crab apple
Rosa canina	Dog rose
Sambucus nigra	Elder
Acer campestre	Field maple
Viburnum opulus	Guelder rose
Crataegus monogyna	Hawthorn
Corylus avellana	Hazel
Corylus avellana	Hazel (coppice)
Ilex aquifolium	Holly
Juniperus communis	Juniper
Quercus (robus/ petraea)	Oak (Pedunculate or sessile)
Sorbus aucuparia	Rowan
Salix (cinerea/ caprea)	Willow (Grey and/or Goat)
Ulmus glabra	Wych elm

Woodland Scattered Scrub grassland

Botanical Name	Common Name
Prunus spinosa	Blackthorn
Frangula alnus	Buckthorn (alder)
Malus sylvestris	Crab apple
Rosa canina	Dog rose
Cornus sanguinea	Dogwood
Viburnum opulus	Guelder rose
Crataegus monogyna	Hawthorn
Ilex aquifolium	Holly
Viburnum lantana	Wayfaring tree

Woodland: Scattered Trees

Botanical Name	Common Name
Alnus glutinosa	Alder
Fraxinus excelsior	Ash
Fagus sylvatica	Beech
Betula (pendula/ pubescens)	Birch (Silver or downy)
Crataegus monogyna	Hawthorn
Quercus (robus/ petraea)	Oak (Pedunculate or sessile)
Sorbus aucuparia	Rowan
Salix (cinerea/ caprea)	Willow (Grey and/or Goat)

Grasslands: Semi-impvoed neutral grassland

Botanical Name	Common Name
Scorzoneroides autumnalis	Autumn hawkbit
Lathyrus linifolius	Bittervetch
Centaurea nigra	Black knapweed
Euphrasia sp.	Eyebright
Alchemilla mollis	Lady's-mantle
Lathyrus pratensis	Meadow vetchling
Leucanthemum vulgare	Ox-eye daisy
Potentilla erecta	Tormentil
Rhinanthus minor	Yellow rattle
Dactylis glomerata	Cock's foot
Agrostis capillaris	Common bent
Cynosurus cristatus	Crested dog's tail
Ranunculus acris	Meadow buttercup
Festuca rubra	Red fescue
Anthoxanthum odoratum	Sweet vernal grass
Trisetum flavescens	Yellow oat grass
Holcus lanatus	Yorkshire-fog

Wetland Standing Water

Botanical Name	Common Name
Persicaria amphibia	Amphibious bistort
Veronica beccabunga	Brooklime
Callitriche stagnalis	Common water starwort
Myosotis scorpioides	Water forget-me-not
Mentha aquatica	Water mint
Alisma plantago-aquatica	Water plantain
Callitriche stagnalis	Water starwort
Juncus inflexus	Hard rush
Cardamine pratensis	Lady's smock (cuckoo flower)
Caltha palustris	Marsh marigold
Stellaria palustris	Marsh stitchwort
Filipendula ulmaria	Meadowsweet
Oenanthe silaifolia	Narrow-leaved water-dropwort
Orchidaceae sp.	Orchids (southern marsh and/or common spotted)
Lythrum salicaria	Purple loosestrife
Lychnis flos-cuculi	Ragged robin
Juncus effusus	Soft rush
Iris pseudacorus	Yellow flag iris

Standing Water: reedbed

Botanical Name	Common Name
Sparganium erectum	Bur-reed
Bistorta officinalis	Common bistort
Phragmites australis	Common reed
Ranunculus flammula	Lesser spearwort
Galium palustre	Marsh bedstraw
Lythrum salicaria	Purple loosestrife
Iris pseudacorus	Yellow flag iris

KEY

- Site Boundary
- 8. Proposed Buildings
- Car Parking
- PRoWS - new alignment proposed
- A. Woodland: Broad-leaved plantation
- B. Woodland: Scattered scrub grassland
- C. Woodland: Scatted trees
- D. Semi-improved neutral grassland
- E. Wetland: Standing water
- F. Standing water: reedbed
- G. Amenity planting
- H. Hedgerows: retained
- I. Hedgerows: proposed

NOTES:

Drawing for Planning Purposes
To be read in conjunction with information prepared by the wider design team

rev	details	date

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project: Gateway 36, Phases 2 and 3, Barnsley

drawing title: Landscape and Ecological Mitigation Plan

drawing status: Planning

drawn by	checked by	date
EP	SF	24 Jan 20

scale	paper size
NTS	A1

job/dwg no.	rev
344-ES-01	-

12. Landscape Appendices

Harworth Group

earne alley Par ay, oc ingham, Barnsley – Phases 2 and 3

Appendix 7.1 – Ecological Appraisal

December 2019

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ev	ssue Status	Prepared ate	pproved ate
-	Draft 1	JDH / 13.11.19	JD / 02.12.19
A	Final	JDH / 13.12.19	JD / 16.12.19

CONTENTS

1.0 SUMMARY 2

2.0 INTRODUCTION 3

3.0 METHODOLOGY 4

4.0 RESULTS 7

5.0 DISCUSSION AND RECOMMENDATIONS 13

FIGURES

Figure 1: Site Location and Designated Sites Plan

Figure 2: Notable Species Plan (Non-avian)

Figure 2b: Notable Species Plan (Avian)

Figure 3: Confidential Badger Plan

Figure 4: Phase 1 Habitat Plan

Figure 5: Bat Transect Plan (18th September 19)

APPENDICES

Appendix A: Consultation Data Summary

Appendix B: Botanical Species List

Appendix C: Static Recorder Summary

Appendix D: Supplementary reports

1.0 SUMMARY

1.1 No internationally designated sites are present within 5km of the site boundary and no nationally designated sites are present within 2km of the site boundary. Two non-statutory sites are present within 1km of the site boundary; Short Wood and Hay Green LWS and Barrow Colliery Site LWS. The proposed development is not expected to negatively impact any of these statutory or non-statutory sites.

1.2 The majority of the site comprises low value habitat of species-poor semi-improved grassland, young broadleaved plantation woodland, improved grassland and developing scrub. Habitats present on-site which are of higher biodiversity value consist of a small compartment of scattered scrub and grassland associated with pond P1 and the hedgerows.

1.3 Monthly bat surveys (May to September inclusive) were undertaken during the 2015 survey season, with seasonal surveys on the northern section of the site in 2017 and an update survey of the whole site in September 2019. Species diversity and activity was considered to be low. It is recommended that linear features, including edge habitats are retained or replaced and buffered where possible to maintain the commuting and foraging resources present on-site for the local bat population. There were no trees or buildings present on-site which were considered to offer roosting potential for bats but it is recommended that bat boxes are installed around the site, particularly in association with linear features.

1.4 Breeding bird surveys were undertaken during the 2015 survey season during which it was found that the site supports breeding bird assemblages typical of the on-site habitats present with the young plantation and scrub habitats being of most value. It is recommended that any ground and vegetation clearance occurs prior to the breeding bird season (March to September inclusive). If this is not possible vegetation will be checked prior to removal by an experienced ecologist. If active nests are found, vegetation will be left untouched and suitably buffered from works until all birds have fledged.

1.5 During great crested newt (GCN) surveys undertaken by AES in 2013, GCN nymphs were recorded in pond P1 and a single GCN was recorded in offsite pond P2 in 2014 by AES. Surveys undertaken in 2015 and 2017 by FPCR recorded no GCN in any of the ponds and so it is considered likely that only a very small GCN population is present at these ponds. Precautionary mitigation is considered suitable to minimise the risk of GCN being harmed whilst works are being undertaken on-site, although eDNA survey will be undertaken in 2020 to confirm this.

1.6 Reptile surveys were undertaken during the 2015 survey season during which no reptiles were recorded on-site. Therefore no further survey or mitigation is considered necessary.

1.7 Water vole surveys were undertaken in 2016 during which no evidence of water vole was recorded. It is therefore considered that this species does not provide a constraint to the proposed development and that no further survey or mitigation is required.

1.8 Badger surveys were undertaken in 2017 and as part of the update surveys during which no evidence of badger was recorded. It is therefore considered that this species does not provide a constraint to the proposed development and that no further survey or mitigation is required.

1.9 Japanese Rose *osa rugosa* was recorded in association with the plantation woodland, this species is listed under Schedule 9 Part 2 of the Wildlife and Countryside Act 1981 (amended) as a non-native invasive species. It is recommended that this plant be dug up and buried on-site during works; plant material from this species should not be removed off-site.

2.0 INTRODUCTION

2.1 The following report has been prepared by FPCR Environment and Design Ltd on behalf of Harworth Group. The site, situated adjacent to Shortwood Business Park, Barnsley, has been the subject of a comprehensive range of ecological surveys since June 2015. The following surveys have been undertaken over this period:

- Desk Study for existing biological data, including designated sites in 2015 and 2019
- Extended Phase 1 Habitat survey including hedgerows with preliminary protected species surveys - June 2015; May 2017; October 2019 – whole site
- Bat activity surveys (static recordings and walked transects) - May - September 2015 – whole site; June – September 2018 - north of A6195 only; September 2019 – whole site
- Breeding Bird Surveys - April – June 2015 – whole site; June 2018 - north of A6195 only
- Reptile Surveys - June and September 2015
- Water vole surveys - June 2016
- Great Crested Newt Surveys - Aquatic survey March – June 2015; March – June 2017; eDNA sampling June 2018 – ponds north of Birdwell only

2.2 This report provides the results of the 2019 surveys, with reference to earlier surveys as appropriate. Details of the earlier surveys can be found in the relevant reports, appended to this report. Earlier surveys covered a slightly wider extent than the current application Site's red line boundary.

Site Location and Context

2.3 The subject site is a former colliery located adjacent to the west of Shortwood Business Park in Barnsley, South Yorkshire (central grid ref: SE 3563 0103) and includes parcels of land to the north and south of the A6195 dual carriageway, Dearne Valley Parkway. Recent development associated with earlier phases of the development lie to the east of the northern parcel. The existing residential development of Birdwell is situated to the north-west and to the south the more extensive residential area of Hoyland. Junction 36 of the M1 Motorway lies less than 600m to the west. The surrounding land use is largely arable and pasture with an area of broad-leaved semi-natural woodland to the north, forming part of the Short Wood and Hay Green LWS.

The site largely comprises establishing plantation woodland and improved pasture, with associated native hedgerows along several linear edges of the plantation areas. Two compartments of species-poor grassland are located in the northern parcel, which comprised actively farmed arable land in May 2017. Several small areas of semi-improved grassland were noted in 2017, although in 2019 these have been noted as beginning to scrub over as natural succession through lack of management has occurred. Other habitats recorded included an attenuation pond and drainage channel (partially culverted).

Development Proposals

2.4 Proposals are for a business park development comprising warehousing with associated parking, lorry compounds and access infrastructure, with landscaping and green-infrastructure, including attenuation facilities.

3.0 METHODOLOGY

Desk Study

3.1 A desk study to compile existing baseline information was undertaken in 2019 to update the earlier desk study undertaken with any new data received. As part of this previous reports were reviewed and relevant ecological information was requested from both statutory and non-statutory nature conservation organisations for the purposes of this appraisal, including:

- Multi Agency Geographic Information for the Countryside (MAGIC) website[1]
- Sheffield Biological Records Centre (SBRC)
- South Yorkshire Bat Group (SYBG)

3.2 Further inspection, using colour 1:25,000 OS base maps (www.ordnancesurvey.co.uk) and aerial photographs from Google Earth (www.maps.google.co.uk) was undertaken in order to provide additional context and identify any features of potential importance for nature conservation in the wider countryside.

3.3 The search area for biodiversity information was related to the significance of sites and species and potential zones of influence, as follows:

- 5km around the subject site for sites of International Importance (e.g. Special Area of Conservation, Special Protection Area, Ramsar site)
- 2km around the subject site for sites of National/ Regional (e.g. Sites of Special Scientific Interest)
- 1km around the subject site for sites of County Importance species records (e.g. protected, Local Wildlife Sites or UK BAP and notable species).

Field Survey – Habitats/Flora

E tended Phase 1 Survey

3.4 A walkover survey of the site was undertaken on 3rd October 2019 by an appropriately experienced ecologist. Extended Phase 1 habitat survey is a survey technique recommended by Natural England that largely follows JNCC 2010[2], with the scale of recording of habitat parcels adjusted to provide more detail for smaller sites. The survey comprised a walkover of the site mapping the principal habitat types present and identifying the dominant or characteristic plant species present within them. The abundance of species was quantified using the DAFOR scale, ranging from Dominant to Abundant, through Frequent and Occasional to Rare.

3.5 Any habitats suitable for, or features with the potential to support, protected or notable species were also assessed and recorded.

edgero ssessment

3.1 Hedgerows were surveyed using the Hedgerow Evaluation and Grading System (HEGS)[3]. This method of assessment includes noting down canopy species composition, associated ground flora

1 http://www.magic.defra.gov.uk/

2 JNCC, (2010), Handbook for Phase 1 habitat survey - a technique for environmental audit, ISBN 0 86139 636 7

3 Clements, D.K. & Tofts, R.J. (1992) Hedgerow Evaluation and Grading System (HEGS): A methodology for the ecological survey, evaluation and grading of hedgerows.

and climbers, structure of the hedgerow including height, width and gaps, associated features including number and species of mature trees, banks, ditches and grass verges.

3.2 Each hedgerow is given a grade using HEGS with the suffixes '+' and '-', representing the upper and lower limits of each grade respectively. These grades represent a continuum on a scale from 1+ (the highest score and denoting hedges of the greatest nature conservation priority) to 4- (representing the lowest score and hedges of the least nature conservation priority) as follows:

- Grade 1 – High to very high value
- Grade 2 – Moderately high to high value
- Grade 3 – Moderate value
- Grade 4 – Low value

3.3 Hedgerows graded 1 or 2 are considered to be a priority for nature conservation.

3.4 The hedgerows were also assessed against the Wildlife and Landscape criteria contained within Statutory Instrument No: 1160 – The Hedgerow Regulations 1997[4] to determine whether they qualified as 'Important Hedgerows' under the Regulations. This was achieved using a methodology in accordance with both the Regulations and DEFRA guidance.

Field Survey – Fauna

Bats

Bat Activity Surveys (Transects)

3.5 A single bat activity survey was undertaken across the site in the autumn bat survey season (September) 2019, comprising a walked transect and a static detector survey. This was undertaken when conditions were suitable, i.e. when the ambient air temperature exceeded 10°C and there was little wind and no rain.

3.6 The primary objective of the transect was to provide an update of foraging areas, commuting routes and species utilisation of the site. Guidance from the Bat Conservation Trust and Natural England[6] indicates that such surveys should be applied appropriately and in a proportionate manner, having regard to the area of habitat affected and the likely direct impact on bats.

3.7 The transect routes were determined prior to survey in order to sample most areas of the site with those areas considered to be of higher suitability for bat use being the main focus of the survey. The routes included point count stops to identify activity levels around the features of potential value to bats that are to be most affected by proposals (i.e. hedgerows, tree lines, dense scrub etc). Each point count was approximately three minutes long, during which time all bat activity was recorded.

3.8 Transects commenced at sunset and were each a minimum of two hours in duration. Each transect was walked at a steady pace and when a bat passed by, the species, time and behaviour was recorded on a site plan. This information provides a general view of the bat activity present on site and identifies the key foraging area/commuting routes.

4 DEFRA (1997) The Hedgerow Regulations 1997: A Guide to the Law and Good Practice, London, HMSO

6 Mitchell-Jones AJ and McLeish AP (2004). *The Bat Workers' Manual, 3rd Edition*. JNCC, Peterborough

3.9 Surveyors used Wildlife Acoustics Inc. Echo Meter Touch® bat detectors in conjunction with Echo Meter Touch® app and Apple Inc. iPad® during the transect surveys to detect bats and aid species identification.

3.10 Post-survey, bat calls were analysed using Wildlife Acoustics, Inc. Kaleidoscope© software package by taking measurements of the peak frequency, inter-pulse interval, call duration and end frequency. From this, the level of bat activity across the site in relation to the abundance of individual species foraging and commuting along habitats was assessed.

Static Bat Detector Surveys

3.11 Static passive recording broadband detectors were deployed on site to supplement the manual transects survey. Due to the size of the site and the assessment of habitat suitability to support foraging and commuting bats, two static units were deployed on site for five consecutive nights.

3.12 Passive monitoring was undertaken using an automated logging system; either Wildlife Acoustics Inc. Song Meter® SM2BAT+ or SM4BAT-FS bat detectors, with outputs saved to an internal storage device. Bat detectors were placed along linear features considered to be of value to bats, such as hedgerows, woodlands, watercourses and tree lines.

3.13 Devices were placed in each location for an extended period of time of suitable weather conditions (little no rain/wind and temperatures above 10°C). The conditions over each of the survey period were however representative for the timing of the survey. Detectors were programmed to activate 30 minutes before dusk and recorded continuously until 30 minutes following sunrise.

3.14 The recorded data was analysed using Wildlife Acoustics, Inc. Kaleidoscope© software package to assess the amount of bat activity on site by recording the number of bat passes

ther Species

3.15 During the survey of the site, observations, signs of or suitable habitat for any species protected under Part I of the Wildlife and Countryside Act 1981 (as amended), the Conservation of Habitats & Species Regulations 2010 and the Protection of Badgers Act 1992. Consideration was also given to the existence and use of the site by other notable fauna such as species of Principal Importance as noted under S41 of the Natural Environment and Rural Communities (NERC) Act 2006, the local BAP (LBAP) or Red Data Book (RDB) species.

Survey limitations

3.16 The updated Phase 1 survey was conducted just outside the recommended survey season and botanical species lists should not be considered exhaustive. It is however considered that sufficient information was collected to enable the determination of broad habitat and types and the identification and assessment of features of ecological value for the purposes of this assessment, given the extent of previous survey information recorded since 2015, including during the recommended seasons, and the nature of the habitats at the Site.

3.17 Similarly only a single bat survey was undertaken in 2019, however, given the extent of earlier survey information and the overall lack of significant change in habitats recorded over time, this is not considered a constraint and it is considered that sufficient information has been gained upon which to base an assessment of the Site's current value to bats and the identification of likely impacts and mitigation required.

4.0 RESULTS

Desk Study

esignated Sites

4.1 The locations of all statutory and non-statutory designated sites described in the subsequent two sections are shown in Figure 1.

Statutory Designated Sites

4.2 No international sites of nature conservation importance are present within a 5km radius of the subject site. No nationally designated sites of nature conservation importance are located within 2km of the site. No SSSI impact zones overlapped the site boundary.

Non-statutory Designated Sites

4.3 Two Local Wildlife Sites (LWS) are located within 1km of the site as detailed within Table 2 below.

Table 2 esignated Sites ithin ones of nfluence

Site Name ef	esignation	esignation eature	ppro imate istance and rientation from Site
Short Wood and Hay Green/637	LWS	Ancient woodland	25m north
Barrow Colliery Site –/1158	LWS	Ancient woodland and semi-improved neutral grassland	700m north-east

Protected / Notable Species

4.4 No records of previous European Protect Species licenses were found within 1km of the site.

4.5 A number of records for protected and notable species were returned by SBRC for the vicinity of the site. Records covering the last 10 years (2009 onwards) are annotated on Figures 2a and 2b and summarised in Appendix A.

4.6 On site records consisted of dingy skipper *Erynnis tages* in the south western section, and an assemblage of amphibians; including great crested newts *Triturus cristatus* and common toad *ufo bufo* near the offsite pond to the west of the northern section of the site.

4.7 Previous amphibian surveys undertaken by Applied Ecological Services (AES) Ltd during 2013 and 2014 (AES Ltd[8]) confirmed the presence of GCN within two of the ponds that border the west of the Site (See Appendix D - Great Crested Newt Report, FPCR 2016,).

4.8 Badger were not recorded on site however there are records of their activity within 1km of the Site. See Confidential Badger Plan (Figure 3).

[8] AES Ltd 2013 *Great Crested e t ate Season Survey oc ingham* AES Ltd 2014 *Survey and Assessment for Great Crested e t Triturus cristatus and other Amphibian Species oc ingham*

Field Survey – Habitats/Flora

4.9 The habitats remain very similar to those recorded in earlier surveys and are described in full below, although some areas are becoming more overgrown through natural succession and a reduction in management. The locations of the habitats described below are illustrated in Figure 4: Phase 1 Habitat Plan. Detailed vegetative species-lists are provided in Appendix B.

Plantation Broadleaved oodland

4.10 This habitat was noted in compartments throughout the site bordering grassland compartments and its extent and condition has remained largely unchanged over time, apart from continued establishment, although is still young and in the thicket stage of establishment. It comprised dense plantings of native trees and shrubs with a c.5-10m high canopy casting a dense shade. A mix of native broadleaved trees was noted with abundant silver birch *etula pendula*, common alder *Alnus glutinosa*, and grey alder *A incana* characterising most areas. Heavily shaded ground flora was limited to sparse patches of rough meadow-grass *Poa trivialis*, common nettle, cow parsley *Anthriscus sylvestris* and was dominated by bramble. Within the plantation woodlands, more open stretches of scattered scrub ran alongside the ditches.

4.11 In 2017, common spotted-orchid *actylorhiza fuchsii* were noted within one of the woodland blocks (see Target Note 2 on Figure 4).

Scrub

4.12 Areas of scattered scrub were found at the periphery of plantation woodlands colonising areas which had previously been classified as semi-improved grassland. Frequent crack willow *Sali fragilis*, silver birch *etula pendula*, and white poplar *Populus alba* were the most common woody species recorded. The underlying grassland vegetation appeared unmanaged with a dense sward, however the species assemblage did not appear to notably differ from the previous 2017 survey records.

4.13 Denser areas of broadleaved scrub were recorded along the A6195.

mage 1 Successional Scrub

mage 2 Successional Scrub

Species-poor Semi-improved rassland

4.14 The northern field compartments; which had previously been under an arable management regime in 2017, appeared to have been left unmanaged. A poor-semi improved grassland has now

developed across the majority of these with a spoil mound at their western end. Abundant Italian rye grass *olium multiflorum* and rough meadow grass *Poa trivialis* characterised the sward. Herb species included frequent common hogweed *Heracleum sphondylium*, common nettle *rtica dioica* and creeping thistle *Cirsium arvense* with patches of locally abundant bramble *ubus fruticosus* agg. and locally frequent common mouse ear *Cerastium fontanum*.

4.15 Other areas of previously recorded semi-improved grassland were still extant, although encroaching scattered scrub was noted throughout as described above. These were largely linear areas, associate with un-managed peripheries of plantation blocks and alongside paths and roads and supported a range of common grass and forb species. The semi-improved grassland road verge bordering the A6195 extended in places into the site boundary. This comprised a mid-length sward of common and widespread species dominated by Yorkshire-fog *Holcus lantatus*, and locally abundant cow parsley *Anthriscus Sylvestris*.

4.16 The area along the western boundary adjacent to P1 was previously recorded as an area of semi-improved grassland supporting greater species diversity and interest and a Phase II Botany Survey was undertaken on 30th August 2017 on this grassland to ascertain whether it met the LWS criteria at this time. Results indicated that it did not support enough species diversity to meet LWS selection criteria.

mproved rassland

4.17 Five compartments of intensively managed improved pasture were recorded in the south of the site. Perennial rye-grass *olium perenne* dominated and both white clover *Trifolium repens* and creeping buttercup *anunculus repens* were frequent. These fields have remained unchanged since earlier surveys.

Bare round

4.18 A spoil mound with a loose rocky substrate is located on the western extent of the northern field compartments. A range of early coloniser species were present. These included frequent bristly ox-tongue *Helminthotheca echioides*, broad-leaved dock *ume obtusifolius*, common ragwort *acobaea vulgaris*, mugwort *Artemisia vulgaris*, red clover *T pratense* and white clover. This habitat was not recorded in earlier surveys.

Standing ater

4.19 A eutrophic attenuation pond (P1) was recorded at the site boundary (the vast majority outside the site). The margins dominated by common bulrush *Typha latifolia* Other flora noted included abundant soft rush *uncus effuses*, locally abundant water mint *entha citrata* and frequent gypsywort *ycopus europaeus*. A steep-sided drainage channel terminated at a culvert head at the north bank.

edgero s

4.20 Twelve native hedgerows were recorded within the site, all appeared to have been planted within the past thirty years, and as such do not qualify under 1997 Hedgerow Regulations. None supported standard trees though most had good connectivity to plantation woodland and supported a moderate number of native canopy species. The majority of lengths were therefore assessed as

being of moderate to high value under the Hedgerow Evaluation and Grading System (HEGS) (scoring -2 to 2+).

Table 3 edgero escriptions

edge ef.	ppro imate Length	E S	escription
H1	195m	HEGS 2	Mixed native species hedge.
H2	325m	HEGS -2	Mixed native species hedge.
H3	135m	HEGS 2	Mixed native species hedge.
H4	160m	HEGS 3	Mixed native species hedge.
H5	80m	HEGS 2+	Mixed native species hedge.
H6	350m	HEGS 2	Mixed native species hedge.
H7	55m	HEGS 2	Mixed native species hedge.
H8	125m	HEGS 2	Mixed native species hedge.
H9	300m	HEGS 2	Mixed native species hedge.
H11	200m	HEGS 2	Mixed native species hedge.
H12	245m	HEGS 3+	Mixed native species hedge.
H13	140m	HEGS 2	Mixed native species hedge.

et itch

4.21 A steep sided wet ditch (D1) was noted flowing south to north close to the western site boundary from a culvert head in the south.

nvasive Species

4.22 Target Note 1 details the locations of the Schedule 9 Japanese rose *osa rugosa* which was growing in several places within the site.

Field Results - Fauna

Badger

4.23 Habitats within the site, including the expanses of grassland and woodland habitats provide suitable foraging and commuting habitat for any local social groups present within the wider local area. Surveys in 2019 recorded no evidence of badgers. No evidence of badger was observed within the application site in either 2015 or 2017. Closest records provided as part of the desk study were over 500m away.

Bats

Roost Assessment

4.24 No buildings or trees were present on site that offered any roosting potential for bats, due to the relatively young age of all of the trees and consequent lack of features.

Habitat Assessment

4.25 The site offers low overall suitability for commuting and foraging bats, predominantly comprising intensively managed farmland of limited value to bat species. Linear edge habitats provide suitability for foraging and commuting bats, with some blocks linked to more suitable and a greater extent of semi-natural habitats off-site, particularly in the northern parcel.

Activity Surveys

4.26 An update survey conducted in September 2019 comprised a single transect and two static detectors (see Figure 5 and Appendix C) and found comparable results to earlier surveys, with species diversity and activity levels recorded remaining broadly similar to previous years. Details of earlier surveys are provided in Appendix D.

Transect : 18h September 2019 (Figure 5)

4.27 A total of 27 bat registrations were recorded during this survey comprising nineteen common pipistrelle, three soprano pipistrelle, four noctule, and a *yctalus sp* The first registration was a common pipistrelle at 19:48 (33 minutes after sunset) which was recorded during point count 3 in the plantation woodland north of the A6195.

4.28 Activity was recorded throughout the south of the site, along woodland edges, hedgerows and above grassland areas. Bats were recorded both commuting and foraging.

Static Bat Detector Surveys

4.29 The summary results for static monitoring of bat activity in 2019 are given within Appendix C and Figure 5 showing locations of units.

4.30 Static detector S1 and S2 each recorded for 66 hours with the detectors deployed on the evening of 25th September 2019 until the morning of 30th September 2019.

4.31 A total of 560 bat registrations were recorded by static detector S1 comprising common and soprano pipistrelle species, noctule, brown long-eared and unidentified *yotis* species.

4.32 Common pipistrelle made up 96% of all registrations from static detector S1. They had an activity peak from 01:00-02:00 totalling 198 registrations over five nights, and their nightly total varied between 7 and 373 registrations.

4.33 A total of 4189 bat registrations were recorded by static detector S2 comprising common and soprano pipistrelle species, brown long-eared and unidentified *yotis* species.

4.34 Common pipistrelle made up 93% of all registrations from static detector S2. They had an activity peak from 21:00-22:00 totalling 750 registrations over five nights, and their nightly total varied between 327 and 1342 registrations.

Breeding Birds

4.35 The young plantation and scrub habitats were previously considered to be of most value to breeding birds and this is considered to remain the case. Previous breeding bird surveys have indicated that these habitats are however utilised by low numbers of birds with no particularly rare species or assemblages recorded, and typical of the habitats present on-site. The managed grassland and farmland habitats recorded very low numbers of farmland specialists, with only one

or two skylark or yellowhammer individuals in the previously arable areas and none in the grassland. Full details are provided in Appendix D.

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Amphibians

4.36 To the north of the A6195 the site was divided between semi-improved grassland fields and plantation broad-leaved woodland. The grassland habitats offered limited suitability for amphibians including GCN due to their exposed nature and lack of habitat structure. The plantation woodland comprised habitat of greater value providing potential connectivity between the ponds surrounding with potential habitat for sheltering and over-wintering. To the south of the A6195 the majority of the site was split between further areas of plantation broad-leaved woodland providing habitat of greater value and intensively managed improved grassland which was considered to be generally unsuitable for GCN.

4.37 The remainder of the habitats included scrub, hedgerows and wet and dry ditches, all of which had value providing potential sheltering and foraging habitat and links across the site and into the wider area.

4.38 Aquatic surveys undertaken by Applied Ecological Services Ltd during 2013 and 2014 (AES Ltd[11]) recorded great crested newt nymphs in pond P1 north of the road during 2013 with a single great crested newt was recorded in pond P2, south of the road in 2014. FPCR undertook surveys on these ponds and a further three located in the woodlands north of the site in 2015 and 2017 during which no GCN were recorded in any of the ponds. Environmental-DNA (eDNA) analysis was undertaken on water samples from two ponds approximately 500m north of the site, to the east of Birdwell in 2018, during which GCN were confirmed as absent. No records of GCN, aside from those recorded at P1/P2 were provided for within 500m of the site as part of the desk study, with one record at a pond over 500m south west from the site and with no connections to it.

Reptiles

4.39 Margins between plantation woodland and grassland provided some suitable habitat for reptile species, however the majority of these areas were characterised by an abrupt transition from grassland to woodland habitats providing a limited extent of edge habitat favoured by reptile species. The former arable fields/poor semi-improved grassland were of limited suitability, although more open established grassland areas provided some suitability. The waterbody and ditches provided potential habitat.

4.40 Reptile surveys in 2015 of suitable habitats recorded no reptile species and no records were returned as part of the desk study.

4.40 Further detailed survey information from 2015 is provided in Appendix D.

ater ole

4.41 The wet ditch (D1) and the two ponds bordering the site were considered to provide some limited suitability for Water Vole *Arvicola amphibius*. No evidence, including latrines, prints, feeding

[11] AES Ltd 2013 *Great Crested e t ate Season Survey oc ingham* AES Ltd 2014 *Survey and Assessment for Great Crested e t Triturus cristatus and other Amphibian Species oc ingham*

evidence or runs, to confirm the presence of water vole was noted during surveys in 2016 in either of the ponds or ditch. Detailed survey information is provided in Appendix D. No records of water vole were returned as part of the desk study.

5.0 DISCUSSION AND RECOMMENDATIONS

Statutory Designations

5.1 There are no internationally designated sites within 5km of the site boundary and no nationally designated sites within 2km. Therefore, there are not considered to be any constraints to the proposed development in this respect.

Non-statutory Designations

5.2 Short Wood and Hay Green LWS is lies 25m north of the site, at its closest. The subject site supports no ancient or mature woodland for which this non-statutory site is designated and no direct habitat loss is proposed. Mitigation will need to put in place to ensure that the LWS is not affected during construction, including through habitat degradation arising from dust deposition, accidental damage or pollution incidents. Mitigation will be put in place through the adherence to current industry best practice recommendations and guidance during site works, implemented via a Construction and Environmental Management Plan (CEMP) to protect biodiversity interests.

5.3 Given that proposals are for a business park it is considered unlikely to result in an increase in pedestrian traffic sufficient to adversely affect the LWS once the site is operational.

Given the separation of the subject site (c.700m including existing residential and woodland) from Barrow Colliery Site LWS, the proposals are not considered likely to significantly affect this site.

Habitats

5.4 The plantation woodland, much of the scrub, improved grassland and the semi-improved habitats are considered to be of low overall ecological value and do not meet the Local Wildlife Site (LWS) selection criteria for Barnsley[14] due to their limited floristic diversity. These areas have since started to become encroached by scrub, likely to be further reducing their diversity although , the area of scattered scrub associated with P1, previously classified as semi-improved grassland is still considered to be of greater diversity when assessed in a site context and will largely be retained by the proposals. Loss of other grassland areas should not be viewed as a constraint to development as these are of limited botanical interest, due to their nature.

5.5 The hedgerows comprised at least 80% native species and as such are a habitat of principal importance under the NERC Act. Planted species-rich hedgerows are also an LBAP habitat for Barnsley. Though the hedgerows were heavily managed and supported limited structural diversity, they were all assessed as being of at least moderately high nature conservation value largely due to their mixed species nature and links with the plantation woodland, and as such these are considered to have non-statutory nature conservation priority and their retention or appropriate replacement recommended on an at least like-for-like basis. With the exception of H13 and H3,

[14] Rotherham Metropolitan Borough Council (March 2011) *otherham ocal ildlife Site System – Part Site Selection Guidelines For otherham*

hedgerows will be lost to facilitate proposals, including H1 and H2 alongside the footpath to be re-routed around the western southern boundaries of the northern parcel. Loss of H1 and H2, or any other hedgerow should not be viewed as a constraint to development, as although of moderate-high value under HEGS, they are not of importance under the Hedgerow Regulations 1997, and are relatively recent features, for which new, at least similar, hedgerow habitat can be re-created and established in a more suitable location.

5.6 Pond P1 supports an area of reedbed, a habitat of principal importance under the NERC Act and also an LBAP habitat for Barnsley and will be retained as part of the proposals within an area of semi-natural habitats, including the grassland noted above and will ensure that this continues to contribute to the semi-natural habitat corridor, which lies to the immediate west of the site.

5.7 The plantation woodlands are of limited intrinsic value, comprising a uniform young structure, with a small range of species. Associated ground flora is also of limited botanical interest. They do however present a large extent of habitat, likely to provide local nature conservation value to a range of fauna species, although no protected species were recorded using these habitats. Proposals are expected to lead to lead to the loss of all these habitats and appropriate replacement planting should be incorporated in the designs.

5.8 Under the NPPF development should seek to contribute a net gain in biodiversity where possible and design will provide habitats which are of greater diversity and interest than those to be lost, ensuring habitat corridors are maintained or created around boundaries and through the site into the wider area. This will maintain and enhance existing ecological networks and links in the local area, including with the habitat corridor at the west of the site and Short Wood and Hay Green LWS to the north to enhance connectivity with the wider ecological network.

5.9 Design will include a range of habitats, with native broadleaved tree planting, scrub and species rich meadow grassland, to enhance the site's biodiversity, with semi-natural habitats in close association to create a more varied mosaic in these areas, including adjacent to off-site habitats. Linear features including hedgerows, trees, grassland and scrub will provide corridors and stepping-stone habitats through the built areas. Any attenuation features required will be designed where possible to maximise their biodiversity benefit, both in form and structure to provide organic non-uniform features which will support a range of habitats associated with wetlands, including aquatic and emergent vegetation, wet and marshy grassland, as well where possible, over-deepening to provide permanent water.

5.10 Hedges H3 and H13 are to be retained and enhanced with new planting, connecting them and extending them along the footpath that follows the southern boundary. New species rich hedgerow planting will compensate for on-site losses required as part of the development, providing an overall net gain in terms of linear habitat, and will all adjoin other semi-natural habitats to maximise their biodiversity value. Further connectivity enhancements will be provided through new linear tree planting on either side of the A6195, which will be under-sown with an appropriate shade tolerant grass mix to create a more diverse ground flora than currently present below the plantation areas.

5.11 Habitats around boundaries with other off-site semi-natural areas should comprise native species and be managed less intensively and for biodiversity, habitats within the built areas/plots may include semi-ornamental or non-native species and may be managed more intensively as required.

5.12 The area to the west of the footpath by pond P1, noted as supporting a slightly more diverse grassland than elsewhere on site, is to be retained and enhanced for biodiversity, with the aim of

restoring the former grassland area. This area, and all retained or new habitats, should be protected during works by including the following precautions

- appropriate fencing should be installed to restrict plant access to this area,
- works access to adjacent land should be from the east of the site,
- Environment Agency guidance for working near water should be followed at all times.

5.13 All new and retained habitats will be subject to sensitive on-going management to promote their biodiversity and viability in the long term. A detailed biodiversity management plan will be developed to support this, including details of the roles, responsibilities and management mechanism to be put in place, with targeted objectives for habitat creation and management, with prescriptions and a five year work programme, together with details of monitoring and reporting.

5.14 Japanese Rose *osa rugosa* which is listed under Schedule 9 Part 2 of the Wildlife and Countryside Act 1981 (amended) as a non-native invasive species was recorded in association with plantation woodland. Under Section 14 (2) of the above act it is an offence to cause to grow in the wild a Schedule 9 plant. It is recommended that this plant be dug up and buried on-site during works and plant material from this species should not be removed off-site.

Protected and or notable species

5.15 Consideration was given throughout the survey to the potential presence of protected species. Principal pieces of legislation protecting wild species to be considered are Part 1 of the Wildlife and Countryside Act 1981 (as amended) (WCA) and the Conservation of Habitats and Species Regulations 2010 (as amended) (Habitats Regulations). The impact that this legislation has on the Planning system is outlined in ODPM 06/2005 Government Circular: Biodiversity and Geological Conservation – Statutory obligations and their Impact within the Planning System.

5.16 This guidance states that as the presence of protected species is a material consideration in any planning decision, it is essential that the presence or otherwise of protected species, and the extent to which they are affected by proposals is established prior to planning permission being granted. Furthermore, where protected species are present and proposals may result in harm to the species or its habitat, steps should be taken to ensure the long-term protection of the species, such as through attaching appropriate planning conditions for example.

5.17 The NPPF advises that LPA's should aim to conserve and enhance biodiversity by applying a set of principles including:

- If significant harm resulting from a development cannot be avoided……, adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;
- Development proposals where the primary objective is to conserve or enhance biodiversity should be encouraged.

5.18 Retention of habitats and species of principal importance under the NERC act 2006 (also previously UK BAP priority species) will assist in conserving the biodiversity value of the site.

5.19 The implications that European protected species have for the proposed development are covered in separate reports referenced in this document.

Bats

5.20 All bat species and their habitats are protected under the Wildlife and Countryside Act 1981 (as amended) and The Conservation of Habitats and Species Regulations 2010. In summary these make it an offence to damage, destroy or obstruct any place used by bats for breeding and shelter, disturb a bat, or kill, injure or take a bat.

5.21 No roosting habitat occurs on site. The site was considered to hold limited value for this group Overall the assemblage recorded during surveys is considered to be unremarkable both in terms of overall bat numbers and the species recorded with both the levels of activity and individual species present being typical of both the local and wider area.

5.22 Taking into account the results of existing data from 2015 - 2019, the features of greatest value to the assemblage recorded are the young plantation woodland edges. The peak static activity was recorded on the site boundary with Shortwood Business Park in 2019. These records consisted almost entirely of common pipistrelle bats and varied largely between nights, but remained consistent over the course of any night, suggesting that they were utilising this area as a foraging resource when local conditions were suitable.

5.23 Whilst habitat of greater value to bats is expected to be removed with the loss of the young plantation areas, design will lead to the creation of new alternative woodland edge habitats along site and plot boundaries linked to off-site suitable bat habitats, which will mitigate the loss of these corridors as they mature. Connectivity through the site will therefore be maintained and enhanced with the creation of a more graded wood-edge habitat than currently and which are therefore likely to support a greater range of invertebrate species to optimise foraging opportunities. Where possible, breaches to these habitats and particularly the boundary habitats should be avoided aside from necessary access. Areas of species rich and wet grassland should be created in association with the new and retained attenuation bodies. These habitats would be of greater interest to invertebrates than the current more species-poor and improved grassland areas and will provide open foraging habitat for bats, linked to the new habitat corridors, creating an area of greater biodiversity in the south-western and northern parts of the site where they adjoin off-site semi-natural habitats.

5.24 Lighting and noise adjacent to all retained and new habitats should be kept to a minimum to minimise disturbance to bats using them. All species of bats are sensitive to artificial light and will avoid well-lit areas. The lighting scheme would be designed with regard to current guidance provided by the Bat Conservation Trust[15] and the Institution of Lighting Professionals[16] and adopt the following principles:

- The avoidance of direct lighting of existing trees, hedgerows, woodland edges and wetland habitats, or areas of habitat creation / landscape planning;
- Where appropriate the road and any flood lighting should use low pressure sodium or high pressure sodium instead of mercury or metal halide lamps;
- Lighting will be directional so that unnecessary light spillage is avoided;
- Lighting columns would in general be as short as possible, although in some locations taller columns would allow reduced horizontal spill, and

[15] Bat Conservation Trust (2011) Statement of the impact and design of artificial light on bats
[16] Institution of Lighting Professionals (2011) Guidance Notes for Reduction of Obtrusive Light

- Lighting levels would be as low as guidelines permit and only used where required for public safety.

5.25 Additional enhancement in the form of bat boxes on suitable placements around the site, especially in association with linear features or woodland and edge habitats would also create additional opportunities for roosting bats. As there is a lack of mature trees on site it likely that pole-mounted boxes will be required.

5.26 Given the overall limited value of the site to bats, It is considered that with the implementation ofteh above the favourable conservation status of the local bat population would not be significantly adversely affected by the proposals.

Breeding Birds

5.27 The principal legislation afforded to the protection of UK wild birds is the Wildlife and Countryside Act 1981 (as amended). Under this legislation all birds, their nests and eggs are protected by law and it is an offence, with certain exceptions to recklessly or intentionally kill take or injure a wild bird, to take, damage or destroy a nest of any wild bird while in use or being built and to take or destroy the egg of a wild bird. Those listed on Schedule 1 of this Act are afforded protection from disturbance when on nest. In addition a number of birds are listed as species of principal importance under the NERC Act (2006)

5.28 The breeding bird surveys undertaken in 2015 have highlighted that the site supports a breeding bird assemblage typical of the habitats present on-site. The young plantation and scrub habitats that were considered to be of most note however these were still considered to be low in overall numbers with no rare species or assemblages considered to be notable. The breeding bird assemblage recorded is considered to be of no more than local nature conservation value. As the current habitats remain broadly similar to those recorded at the time of the breeding bird survey, it is reasonable to assume that there would also be no significant changes to the current breeding bird assemblage at the site at this time.

5.29 Habitats suitable for breeding and foraging will be lost. Although new suitable habitat will be created which will provide a more structurally diverse habitat for breeding and foraging birds in the long term, there would be a loss of potential breeding habitat as this matures. Given the numbers and species of breeding birds recorded, this loss would not be expected to significantly affect the local breeding status of birds using the site.

5.30 The site is not considered to support any bird species considered to be particularly sensitive to disturbance with the vast majority of species recorded being typical of urban/suburban habitats whilst the remainder, including yellow hammer, whilst typically found in rural areas are not particularly sensitive to disturbance. It should however be noted that some disturbance will occur from activities including construction work, mainly machinery noise and construction personnel. Such impacts could potentially cause the temporary displacement of some birds from the site or nearby habitats and a consequent reduction in breeding success in the immediate surrounds. Effects of this would be lessened where works are phased and not all areas of the site would be affected at the same time.

5.31 To avoid disturbance to breeding birds, it is recommended that ground clearance works and vegetation removal should be undertaken prior to the bird-breeding season (March to September inclusive). Where this is not possible, vegetation will be checked prior to removal by an experienced

ecologist. If active nests are found, vegetation will be left untouched and suitably buffered from works until all birds have fledged. Specific advice will be provided prior to undertaking the clearance. This would be a statutory requirement due to the protection of all nesting birds and their nests under the Wildlife and Countryside Act, 1981. Given the extent and nature of habitat removal it is recommended that any removal during the breeding season should be carefully considered to ensure appropriate checking and removal methods are used. This may include incremental supervised clearance by a suitably qualified ecologist of more dense or larger sections.

5.32 A range of bird boxes should be installed to provide additional nesting habitat.

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Amphibians

5.33 Great crested newts and their habitats in water and on land are protected under the Wildlife and Countryside Act 1981 (as amended), and by the Conservation of Habitats and Species Regulations 2010. These make it an offence to damage, destroy or obstruct any place used by great crested newts for breeding or shelter, disturb a great crested newt, or kill, injure or take any great crested newts. In addition, great crested newt is listed as a species of principal importance under the provisions of the NERC Act 2006.

No GCN were found during earlier precautionary works associated with Phase 1 of the wider development and the GCN surveys undertaken by FPCR in 2015 and 2017 also observed no GCN. Based on this and in conjunction with the results of previous survey which recorded a very small population of GCN in 2014 it is considered likely that at most only a very small number of individual GCN are likely present.

As the survey data from 2017 will be two years old after the 2019 season, in order to confirm current presence/absence of this species an eDNA survey will be conducted on all ponds surveyed in 2017 in April 2020. In the event that GCN are now found to be present, a population size class assessment based on full aquatic surveys will be carried out and this will inform mitigation. Should GCN be re-confirmed as absent, then no further survey or mitigation will be required with regards this species.

5.34 Should the results indicate GCN presence, whilst further survey will be used to fully inform mitigation requirements. However, given only a single GCN was recorded in 2013, and absence recorded during all subsequent surveys it is considered likely that any population recorded will remain within the lower end of the low population size class and precautionary works as previously undertaken during Phase 1 of the development close to P2 will remain sufficient in order to ensure that no GCN or common amphibians are harmed as part of the proposals. The following precautionary mitigation would be implemented based on that approved as part of the earlier phase of works (as detailed further within the great crested newt report (FPCR 2016):

- Any areas proposed for works to habitats within 60 m of P2 shall be subject to a ‘finger-tip’ search by a qualified ecologist immediately prior to works commencing. This should take place outside of the hibernating season (typically November – February inclusive) and will include searching all areas that have the potential to be utilised by GCN (and common amphibian) such as scrub, tussocky grassland, woodland and any refuge or form of potential sheltering habitat. Vegetation should be removed within 24hrs and checked again if there is a delay past this

period. In the event that GCN are found works will stop and advice sought from the LPAthe ecologist.

- To avoid creation of new habitat all vegetation should be removed from site, raised on pallets or centrally located within arable unsuitable or cleared compartments to remove any potential for habitation and subsequent harm to these species.
- Suitable Pprotective fencing should be installed around all ponds and surrounding terrestrial habitat that will not be affected by the works to ensure that there are no direct impacts to these habitats through accidental ingress. Fencing should remain in place for the duration of works and there should be no transgression of people or machinery past this point.
- No machinery / plant or construction material should be stored within fenced areas to avoid potential harm to GCN and all appropriate pollution-prevention measures shall be undertaken to ensure no adverse impacts upon any waterbodies.

5.35 Should a larger population than described above be recorded, then mitigation would be amended as necessary. Dependent on results, this may include an extension of the area into which precautionary working methods apply, or the undertaking of works subject to a European Protected Species licence from Natural England to clear the development site of GCN into a suitable receptor site prior to works within the affected area.

Reptiles

5.36 Although habitats within the site were considered to provide some potential for occupation by reptile species, none were recorded during the presence/absence surveys undertaken in 2015. It is possible that the isolation of the site by surrounding roads and residential development has prevented colonisation, although there are no known records of reptiles within the search area.

5.37 Therefore, based on the above, it is considered that the presence of reptiles can be reasonably discounted and that there are no constraints to the proposals from the presence of reptile species. As such no further survey or mitigation is considered necessary.

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Badger

5.38 Badgers are protected by statute under The Protection of Badgers Act 1992. This legislation makes it an offence to wilfully kill, injure, take possess or cruelly ill-treat a badger, or intentionally or recklessly interfere with a sett.

5.39 No evidence of badger was observed during any surveys between 2015 and 2019. Whilst the grassland and woodland habitats within the site offer suitable foraging habitat to badgers, based on the absence of field signs, the site does not form an important area of foraging for any local group which may be present in the wider area (the closest known record being at least 500m away). No impacts to any social group are therefore anticipated and the species does not pose a constraint to development.

5.40 In accordance with best practice, a full badger survey will be conducted prior to each stage of site clearance in the development programme. Where in the unlikely events any setts are identified and disturbance impacts are considered significant, mitigation will be put in place for any affected setts

and may be ratified under licence by Natural England. This is likely to involve either supervised and licensed sett closure and / or the use of protective badger fencing where appropriate.

Hedgehog

5.41 Hedgehogs are known to be present in the wider area and as such habitat connectivity should be protected by insuring gaps in fences. These should measure 13x13cm to allow hedgehogs free movement but prevent passage for larger predators.

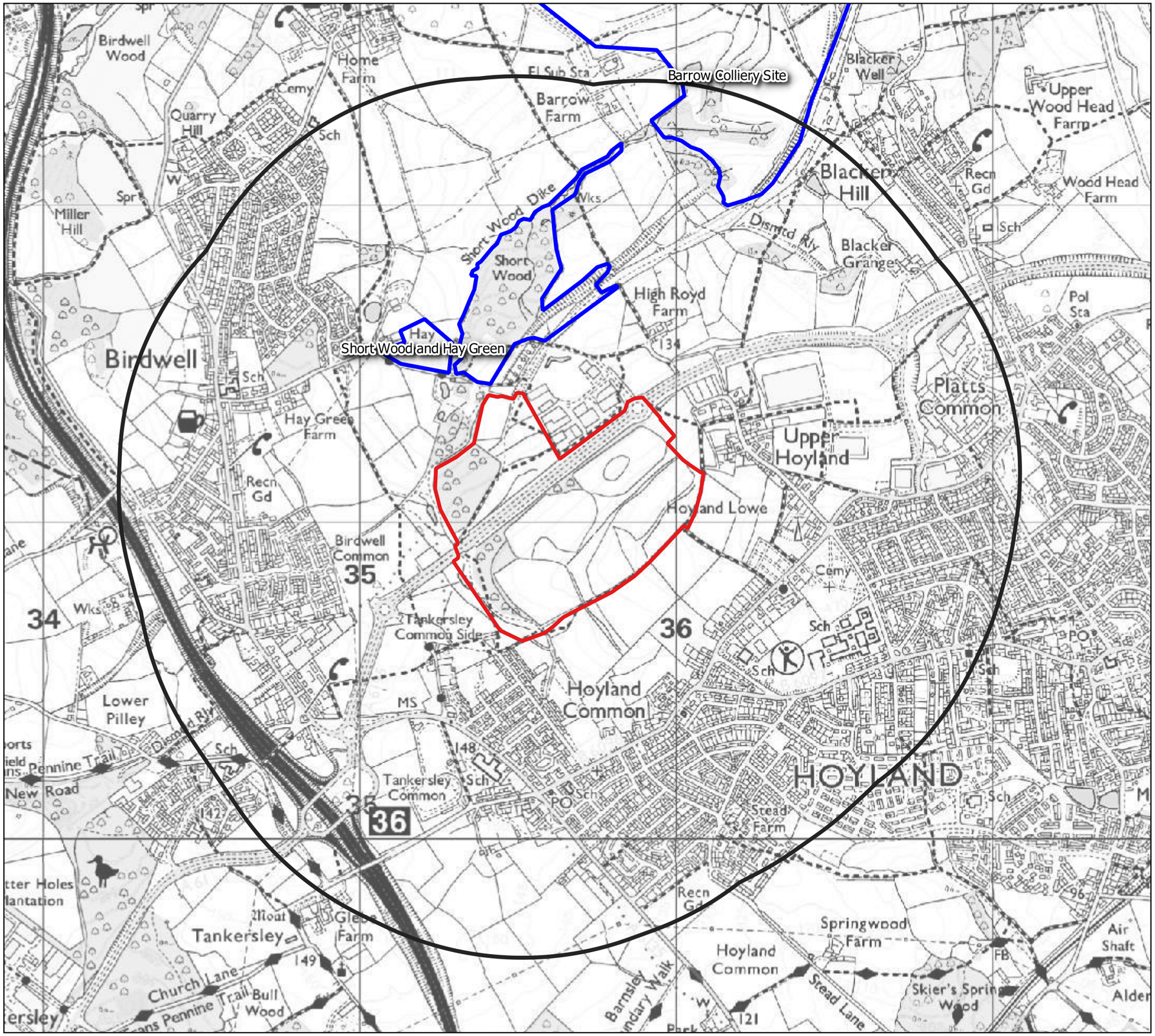
Water Vole

5.42 The absence of local recent records and field signs indicates that the site is of negligible interest for water voles. The pond was considered to be the only feature on-site which offered any potential to support this species. The site is considerably separated from all surrounding records of water vole both in term of distance and connectivity, with all of the records being historical. It is therefore considered that if populations were still present in the wider area, individuals would be highly unlikely to colonise the limited area of suitable habitats within site. It is therefore considered that this species does not provide a constraint to the proposed development and that no further survey or mitigation is required.

Invertebrates

5.43 A collection of Lepidoptera records were returned from the data consultation. Due to the presence of common and widespread habitats within the site, it is considered likely that invertebrate assemblages within the site reflect that of the wider area.

5.44 Invertebrates can be supported with a sensitive planting scheme. There is a range of genera suitable for lepidopteran species, and a diverse planting scheme should be used to reflect this.



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Key

- Site Boundary
- 1km Search Radius
- Local Wildlife Sites (LWS)

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masterplanning ▪ environmental assessment ▪ landscape design ▪ urban design ▪ ecology ▪ architecture ▪ arboriculture

client
Harworth Estates

project
Rockingham Business Park, Barnsley

drawing title
SITE LOCATION AND DESIGNATED SITES PLAN

scale @ A3: 1:12500
drawn MAF / JDH
issue 28/11/2019

drawing / figure number **Figure 1**
rev **6424-E-02**

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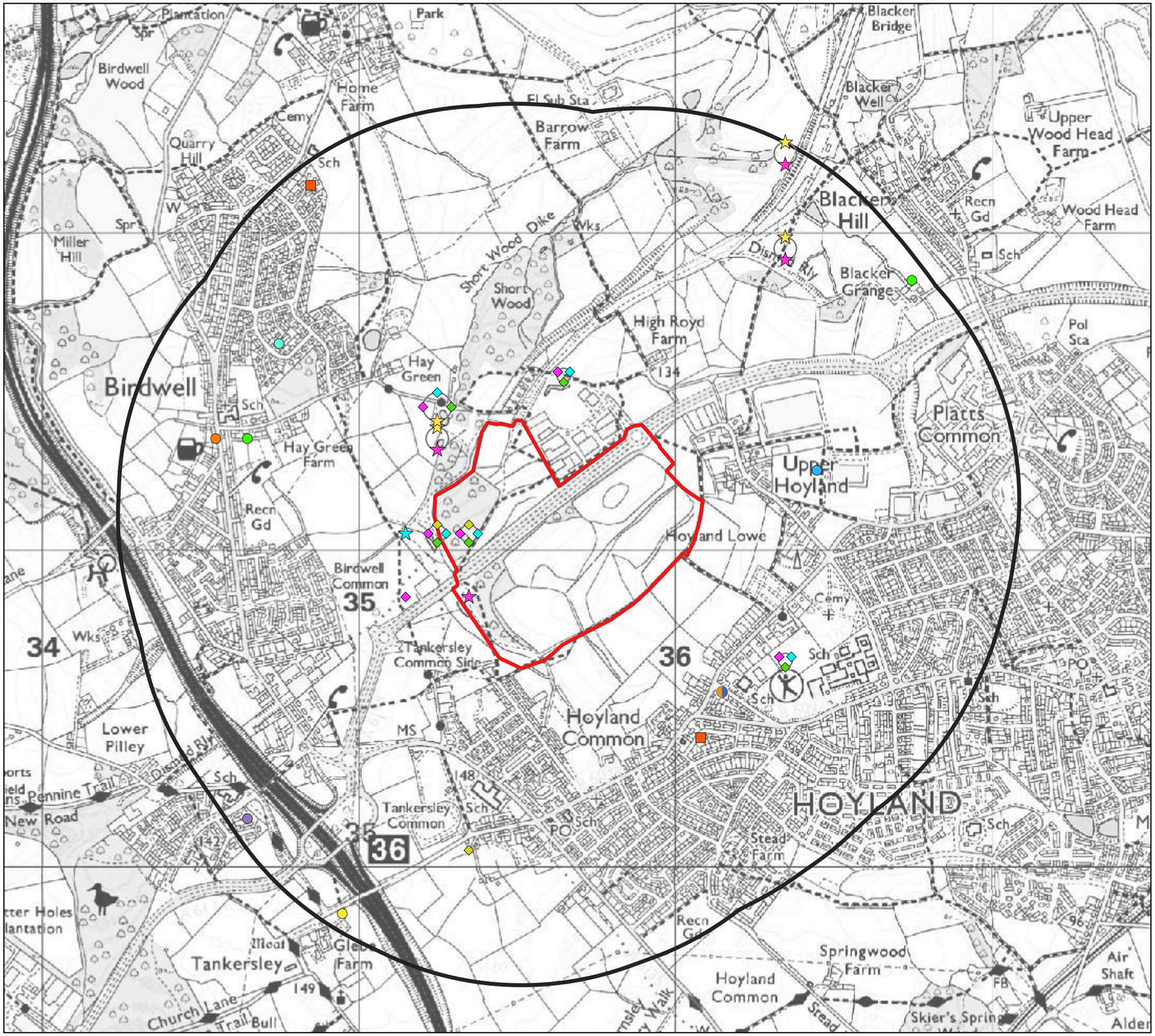

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Key

- Site Boundary
- 1km Search Radius

Bats

- Common Pipistrelle
- Leisler's
- Soprano pipistrelle
- Bat sp.
- Brown long-eared
- Pipistrelle sp.
- Whiskered

Herpetofauna

- Common Frog
- Common Toad
- Great Crested Newt
- Smooth Newt

Insects

- Cinnabar
- Dingy Skipper
- Small Heath

Other Mammals

- Hedgehog

client
Harworth Estates

project
Rockingham Business Park, Barnsley

drawing title
NOTABLE SPECIES PLAN (Non-avian)

scale @ A3: 1:12500
drawn MAF / JDH
issue 28/11/2019

drawing / figure number **Figure 2a**
rev **6424-E-01**

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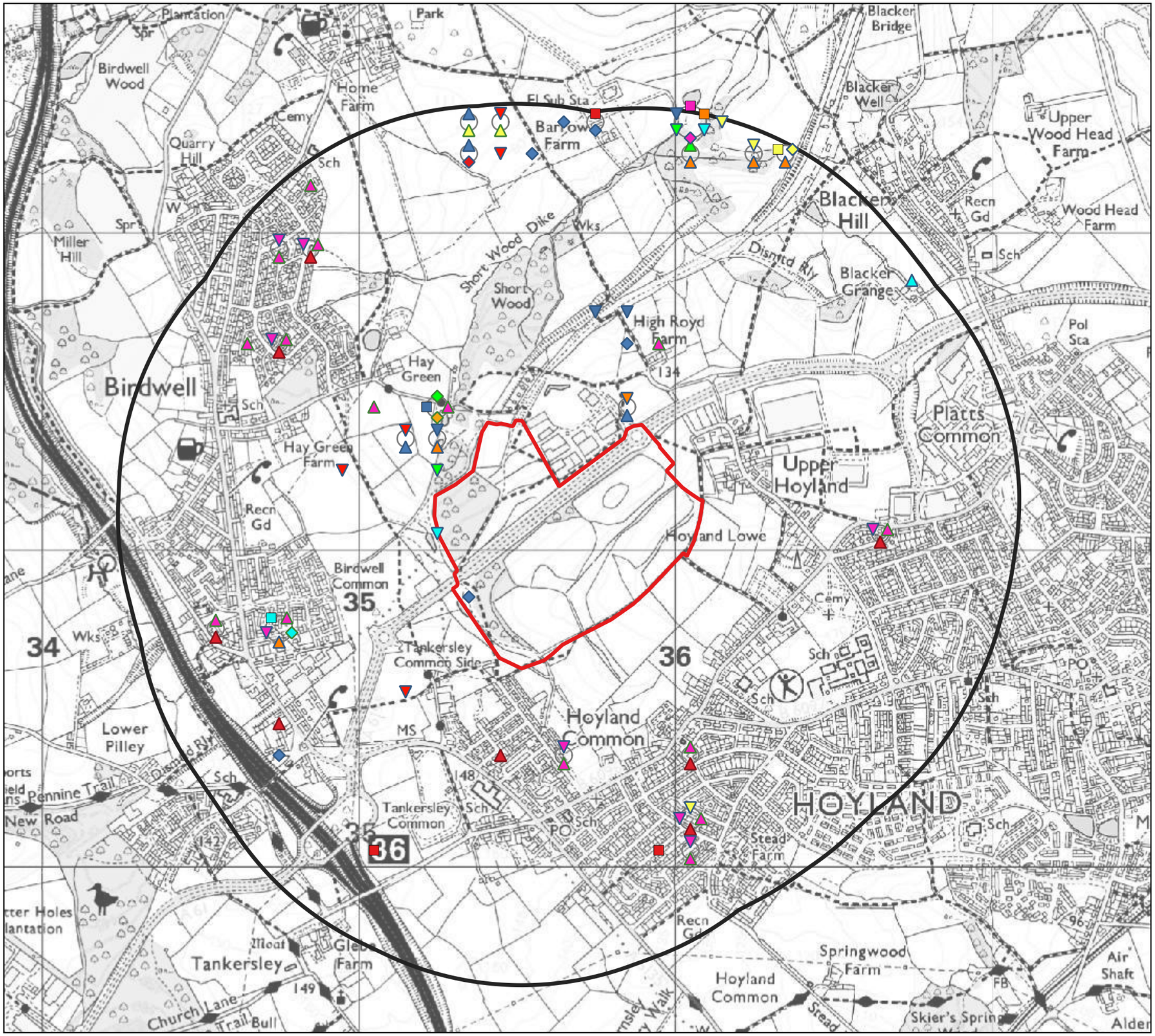

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Key

- Site Boundary
- 1km Search Radius

Local Priority Species

- Barn Owl
- Bullfinch
- Dunnock
- Grey Partridge
- House Sparrow
- Lapwing
- Lesser Redpoll
- Reed Bunting
- Ringed Plover
- Skylark
- Song Thrush
- Starling
- Willow Tit
- Willow Warbler

Other Notable Species

- Fieldfare
- Garganey
- Golden Plover
- Goshawk
- Green Sandpiper
- Kestrel
- Mallard
- Redwing
- Stock Dove
- Swift
- Tawny Owl
- Teal
- Yellowhammer

client
Harworth Estates

project
Rockingham Business Park, Barnsley

drawing title
NOTABLE SPECIES PLAN (Avian)

scale @ A3: 1:12500
drawn MAF / JDH
issue 28/11/2019

drawing / figure number **Figure 2b**
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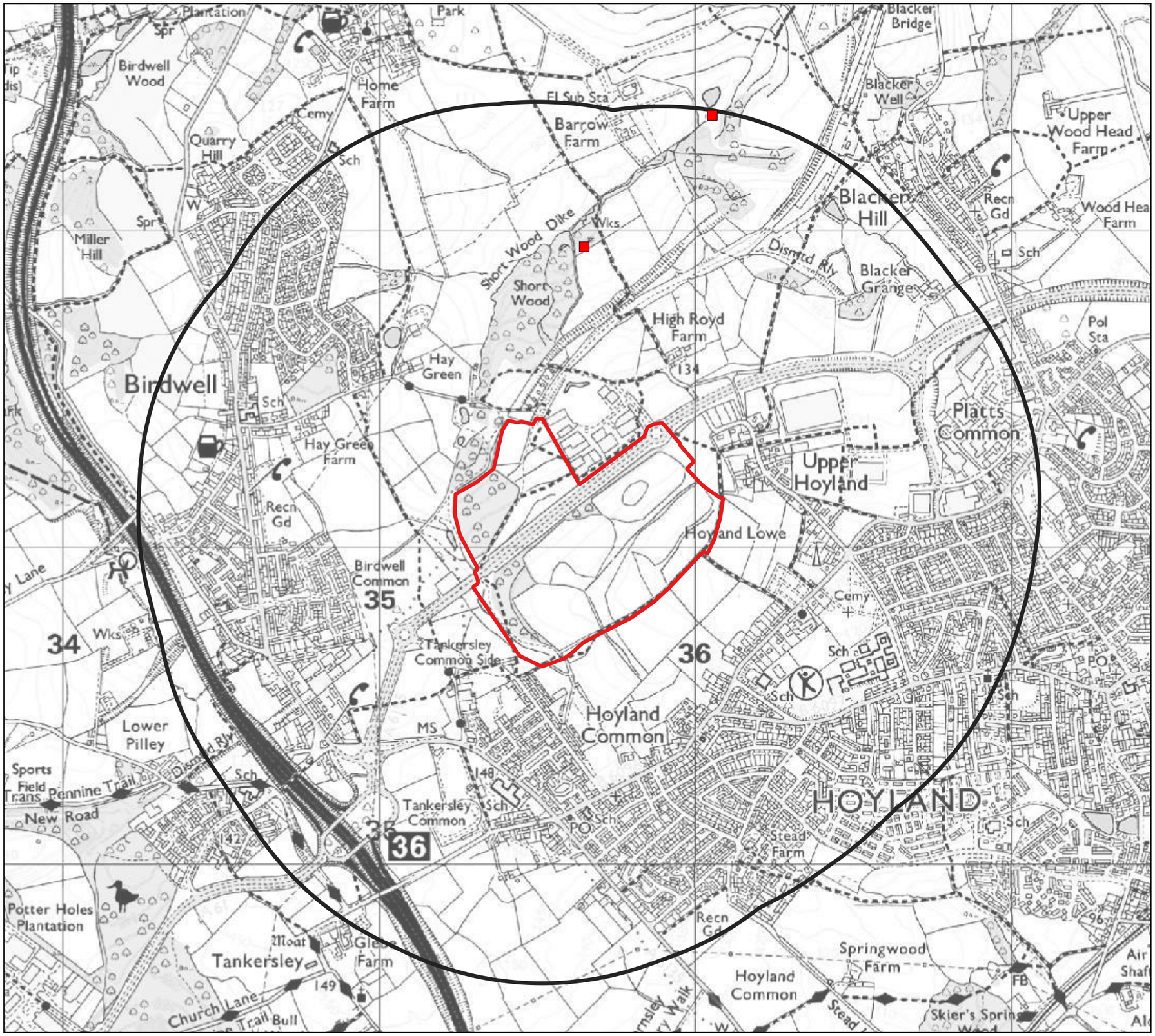

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Key

- Site Boundary
- 1km Search Radius
- Badger Records

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client
Harworth Estates

project
Rockingham Business Park, Barnsley

drawing title
CONFIDENTIAL BADGER PLAN

scale @ A3: 1:12500
drawn MAF / JDH
issue 28/11/2019

drawing / figure number **Figure 3**
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Key

- Bare ground
- Broadleaved woodland - plantation
- Broadleaved woodland - semi-natural
- Built Environment: Buildings/hardstanding
- I — Improved grassland
- SI — Poor semi-improved grassland
- Scrub - dense/continuous
- Scrub - scattered
- Standing water
- Intact hedge - species-poor
- Running water
- Dry ditch
- Target note (with ref)

TN1- Schedule 9 invasive non-native Japanese Rose Rosa rugosa.

TN2-3 spikes of Common Spotted-orchid Dactylorhiza fuchsii

client
Harworth Group

project
Dearne Valley Parkway, Rockingham, Barnsley- Phase 2 and 3

drawing title
PHASE 1 HABITAT PLAN

scale @ A3	drawn	issue
1:3000	JDH	24/1/2020

drawing / figure number	rev
Figure 4	**6424**

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0 50 100 150 200 m

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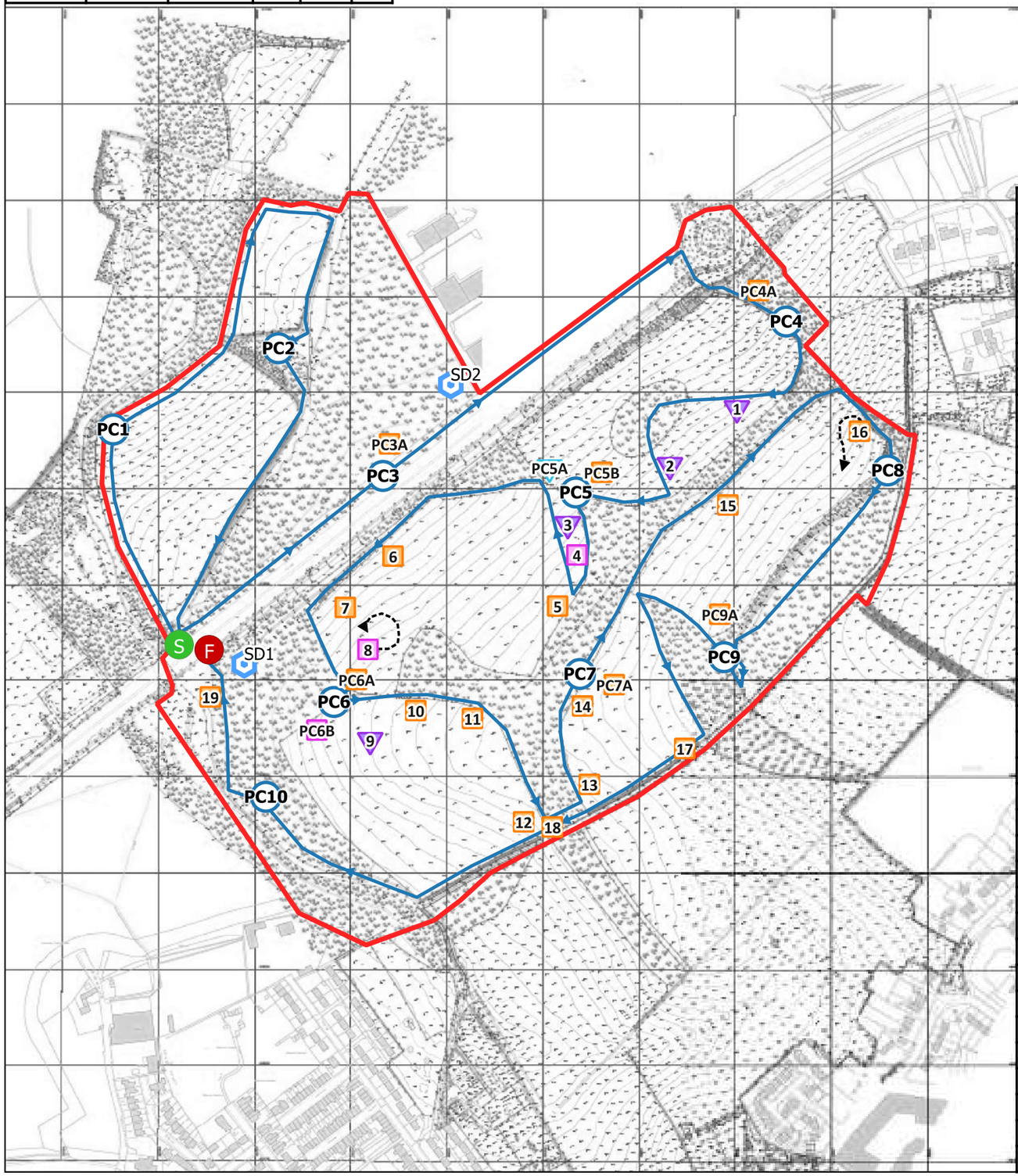
Date:	18.09.2019	Sunset:	19:15	Wind:	1
Start Time:	19:15	Start Temp:	16	Rain:	0
End Time:	21:15	End Temp:	12	Cloud:	65%



Plan Ref	Time	Species	Behaviour	Passes
PC1	19:19-19:22			
PC2	19:31-19:34			
PC3	19:46-19:49			
PC3a	19:48	Common Pipistrelle	Commuting	1
PC4	19:59-20:02			
PC4A	20:01	Common Pipistrelle	Foraging	3
1	20:03	Noctule	Commuting	1
2	20:05	Noctule	Foraging	3
PC5	20:07-20:10			
PC5a	20:08	Nyctalus sp.	Foraging	3
PC5b	20:08	Common Pipistrelle	Foraging	3
3	20:10	Noctule	Commuting	1
4	20:11	Soprano Pipistelle	Commuting	1
5	20:12	Common Pipistrelle	Foraging	Cont.
6	20:15	Common Pipistrelle	Commuting	1
7	20:18	Common Pipistrelle	Foraging	Cont.
8	20:19	Soprano Pipistelle	Foraging	2
PC6	20:20-20:23			
PC6a	20:20	Common Pipistrelle	Foraging	Cont.
PC6b	20:21	Soprano Pipistelle	Foraging	Cont.
9	20:25	Noctule	Foraging	2
10	20:26	Common Pipistrelle	Foraging	Cont.
11	20:29	Common Pipistrelle	Foraging	Cont.
12	20:33	Common Pipistrelle	Foraging	Cont.
13	20:35	Common Pipistrelle	Foraging	Cont.
14	20:38	Common Pipistrelle	Foraging	Cont.
PC7	20:40-20:43			
PC7a	20:42	Common Pipistrelle	Foraging	2
15	20:44	Common Pipistrelle	Foraging	Cont.
16	20:47	Common Pipistrelle	Foraging	3
PC8	20:48-20:51			
PC9	20:53-20:56			
PC9a	20:53	Common Pipistrelle	Foraging	Cont.
17	21:01	Common Pipistrelle	Commuting	1
18	21:03	Common Pipistrelle	Foraging	Cont.
PC10	21:08-21:11			
19	21:12	Common Pipistrelle	Foraging	4

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Key:

- Site Boundary
- Static Detector (with ref.)
- Start point
- Finish point
- Point Count Locations (with ref.)
- Transect Route
- Flight Arrow

Bat Contacts (with ref.)

- Common Pipistrelle
- Soprano Pipistrelle
- Nyctalus Species
- Noctule

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0 50 100 150 200 250 m

client
Harworth Estates

project
Rockingham Business Park, Barnsley

drawing title
BAT TRANSECT PLAN (18th September 2019)

scale @ A3: 1:5000
drawn: EJS / JDH
issue: 6/12/2019

drawing / figure number: **Figure 5**
rev: -

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APPENDIX A: CONSULTATION DATA SUMMARY

Common name	Scientific name	Most recent record	Records (Since 2009)	Status
mphibians				
Common frog	*ana temporaria*	2015	16	WCA, Priority
Common toad	*ufo bufo*	2015	17	NERC, WCA, Priority
Great crested newt	*Triturus cristatus*	2014	5	NERC, WCA, Priority
Smooth newt	*issotriton vulgaris*	2015	12	WCA, Priority
Bats				
Brown long-eared	*Plecotus auritus*	2009	1	ECCD, NERC, WCA, Priority
Common pipistrelle	*Pipistrellus pipistrellus*	2017	2	ECCD, WCA, Priority
Leisler's	*yctalus leisleri*	2014	1	ECCD, WCA, Priority
Pipistrelle sp	*Pipistrellus*	2016	2	ECCD, NERC, WCA, Priority
Soprano pipistrelle	*Pipistrellus pygmaeus*	2012	1	ECCD, NERC, WCA, Priority
Unknow bat sp.	*espertilionidae*	2012	2	ECCD, NERC, WCA, Priority
Whiskered	*yotis mystacinus*	2016	1	ECCD, WCA, Priority
Birds				
Barn Owl	*Tyto alba*	2011	1	Schedule 1, Priority
Blackbird	*Turdus merula*	2014	32	
Bullfinch	*Pyrrhula pyrrhula*	2018	6	NERC, Schedule 3, BOCC 4 (Amber), Priority
Dunnock	*Prunella modularis*	2009	16	NERC, BOCC 4 (Amber), Priority
Fieldfare	*Turdus pilaris*	2009	2	Schedule 1&4, BOCC 4 (Red)
Garganey	*Anas uer uedula*	2017	2	Schedule 1, BOCC 4 (Amber)
Goldcrest	*egulus regulus*	2018	1	
Golden Plover	*Pluvialis apricaria*	2013	8	Schedule 2(1)&3(1)
Goldfinch	*Carduelis carduelis*	2014	11	
Goshawk	*Accipiter gentilis*	2015	1	Schedule 1&4
Green Sandpiper	*Tringa ochropus*	2012	1	Schedule 1, BOCC 4 (Amber)
Grey Partridge	*Perdi perdi*	2015	4	NERC, BOCC 4 (Red), Priority
House Sparrow	*Passer domesticus*	2015	31	NERC, BOCC 4 (Red), Priority

Common name	Scientific name	Most recent record	Records (Since 2009)	Status
Kestrel	*Falco tinnunculus*	2016	7	Schedule 4, BOCC 4 (Amber)
Lapwing	*anellus vanellus*	2016	8	NERC, BOCC 4 (Red), Priority
Lesser Redpoll	*Acanthis cabaret*	2016	1	NERC, BOCC 4 (Red),Priority
Mallard	*Anas platyrhynchos*	2015	1	Schedule 2(1)&3(3), BOCC 4 (Amber)
Redwing	*Turdus iliacus*	2009	2	Schedule 1&4, BOCC 4 (Red)
Reed Bunting	*Emberiza schoeniclus*	2017	6	NERC, BOCC 4 (Amber), Priority
Ringed Plover	*Charadrius hiaticula*	2010	4	BOCC 4 (Red), Priority
Skylark	*Alauda arvensis*	2018	7	NERC, BOCC 4 (Red), Priority
Song Thrush	*Turdus philomelos*	2016	5	NERC, Schedule 3(1), BOCC 4 (Red), Priority
Starling	*Sturnus vulgaris*	2009	16	NERC, BOCC 4 (Red), Priority
Stock Dove	*Columba oenas*	2016	1	BOCC 4 (Amber)
Swallow	*Hirundo rustica*	2015	4	
Swift	*Apus apus*	2018	5	BOCC 4 (Amber)
Tawny Owl	*Stri aluco*	2015	1	BOCC 4 (Amber)
Teal	*Anas crecca*	2013	2	Schedule 2(1)&3(3), BOCC 4 (Amber)
Willow Tit	*Poecile montana*	2015	5	NERC, BOCC 4 (Red), Priority
Willow Warbler	*Phylloscopus trochilus*	2018	3	BOCC 4 (Amber), Priority
Yellowhammer	*Emberiza citrinella*	2017	1	NERC, BOCC 4 (Red)
nvertebrates				
Dingy Skipper	*Erynnis tages*	2016	4	NERC, RedList (Vulnerable), Priority
Small Heath	*Coenonympha pamphilus*	2016	6	NERC, RedList (Near Threatened)
Cinnabar	*Tyria jacobaeae*	2014	1	NERC
ther ammals				
Badger	*eles meles*	2016	2	PBA, WCA
West European Hedgehog	*Erinaceus europaeus*	2016	3	NERC, WCA, Priority

Key to Conservation Status: WCA – Wildlife & Countryside Act 1981 (as amended), SCH1/2/3 – Birds listed on Schedule 1/2/3 of the Wildlife & Countryside Act 1981 (as amended), NERC- Natural Environment and Rural Communities Act (Section 41), ECCD- European Communities Council Directive on the Conservation of Natural Habitats and Wild Fauna and Flora (Annexe 4), RedList- IUCN Red List 2001, Local Priority– Barnsley Biodiversity Action Plan 2009, BOCC – Birds of Conservation Concern 4 (red/amber)

APPENDIX B: BOTANICAL SPECIES LISTS

bundance Key

Dominant	D
Abundant	A
Frequent	F
Occasional	O
Rare	R
Locally Dominant/Abundant/Frequent/Occasional/Rare	LD/A/F/O/R

Bare round (Spoil ound)

Common Name	Scientific Name	re uency
Bristly oxtongue	*Helminthotheca echioides*	F
Broad-leaved Dock	*ume obtusifolius*	F
Cock's-foot	*actylis glomerata*	O
Colts foot	*Tussilago farfara*	LF
Common Ragwort	*acobaea vulgaris*	F
Common vetch	*icia sativa*	R
Creeping Thistle	*Cirsium arvense*	O
Crested dog's -tail	*Cynosurus cristatus*	F
Dove's-foot crane's-bill	*Geranium molle*	R
False oat grass	*Arrhenatherum elatius*	R
Hedge Mustard	*Sisymbrium officinale*	O
Kentucky Bluegrass	*Poa Pratensis*	O
Meadow foxtail	*Alopecurus pratensis*	O
Mugwort	*Artemisia vulgaris*	F
Pineapple Weed	*atricaria discoidea*	R
Prickly Sow	*Sonchus asper*	O
Red Clover	*Trifolium pratense*	F
Ribwort Plantain	*Plantago lanceolata*	O
Smooth sow thistle	*Sonchus oleraceus*	O
Weld	*eseda luteola*	R

Common Name	Scientific Name	re uency
White Clover	*Trifolium repens*	F
Willow	*Sali sp*	O

Plantation Broadleaved oodland

Common Name	Scientific Name	re uency
Ash	*Fra inus e celsior*	O
Bramble	*ubus fruticosus agg*	D
Cleavers	*Galium aparine*	P
Cock's-foot	*actylis glomerata*	F
Common Alder	*Alnus glutinosa*	A
Common Bird's-foot-trefoil	*otus corniculatus*	O
Common Mouse-ear	*Cerastium fontanum*	O
Common Vetch	*icia sativa*	P
Cow Parsley	*Anthriscus sylvestris*	O
Creeping Buttercup	*anunculus repens*	F
Creeping Thistle	*Cirsium arvense*	O
Crested Dog's-tail	*Cynosurus cristatus*	R
Curled Dock	*ume crispus*	R
Daisy	*ellis perennis*	R
Dandelion	*Tara acum officinale agg*	P
Dogwood	*Cornus sanguinea*	R
Glaucous Sedge	*Care flacca*	R
Grey Alder	*Alnus incana*	A
Hairy Tare	*icia hirsuta*	O
Hawthorn	*Crataegus monogyna*	O
Hybrid Oak	*uercus petraea robur rosacea*	P
Meadow Vetchling	*athyrus pratensis*	O
Pedunculate Oak	*uercus robur*	R
Red Clover	*Trifolium pratense*	O
Red Fescue	*Festuca rubra agg*	R
Ribwort Plantain	*Plantago lanceolata*	O
Rough Meadow-grass	*Poa trivialis*	P
Sallow	*Sali sp*	P
Sessile Oak	*uercus petraea*	LO

Common Name	Scientific Name	re uency
Silver Birch	*etula pendula*	A
Tufted Vetch	*icia cracca*	LF
White Clover	*Trifolium repens*	O
Wild Angelica	*Angelica sylvestris*	LF
Yarrow	*Achillea millefolium*	R
Yorkshire-fog	*Holcus lanatus*	D

mproved rassland (Southern ields)

Common Name	Scientific Name	re uency
Annual Meadow Grass	*Poa annua*	F
Broad-leaved Dock	*ume obtusifolius*	R
Broad-leaved Plantain	*Plantago major*	O
Common Mouse Ear	*Cerastium fontanum*	R
Perennial Ryegrass	*olium perenne*	D
Red Clover	*Trifolium pratense*	F
Rough Meadow-grass	*Poa trivialis*	F
White Clover	*Trifolium repens*	F
Yarrow	*Achillea millefolium*	O

Poor Semi-improved rassland (Northern ields)

Common Name	Scientific Name	re uency
Bramble	*ubus fruticosus agg*	LA
Broad-leaved dock	*ume obtusifolius*	O
Cock's-foot	*actylis glomerata*	F
common hogweed	*Heracleum sphondylium*	F
common mouse ear	*Cerastium fontanum*	LF
Common nettle	*rtica dioica*	F
Cow parsley	*Anthriscus sylvestris*	O
Creeping thistle	*Cirsium arvense*	F
Curly dock	*rume crispus*	R
Dandelion	*Tara acum officinale*	R
Italian rye grass	*olium multiflorum*	A
Perennial ryegrass	*olium perenne*	F
Rough Meadow-grass	*Poa trivialis*	A
Yorkshire fog	*Holcus lantatus*	F

Poor Semi-improved rassland (oad erges)

Common Name	Scientific Name	re uency
Broad-leaved Dock	*ume obtusifolius*	R
Cock's-foot	*actylis glomerata*	F
Colt's-foot	*Tussilago farfara*	P
Common Mouse-ear	*Cerastium fontanum*	F
Common Nettle	*rtica dioica*	O
Common Vetch	*icia sativa*	R
Cow Parsley	*Anthriscus sylvestris*	LA
Creeping Buttercup	*anunculus repens*	R
Creeping Thistle	*Cirsium arvense*	O
Dove's-foot Crane's-bill	*Geranium molle*	R
Hairy Tare	*icia hirsuta*	R
Meadow Buttercup	*anunculus acris*	R
Mugwort	*Artemisia vulgaris*	R
Oxeye Daisy	*eucanthemum vulgare*	R
Red Fescue	*Festuca rubra agg*	O
Ribwort Plantain	*Plantago lanceolata*	O
Rough Hawk's-beard	*Crepis biennis*	LF
Rough Meadow-grass	*Poa trivialis*	O
Sallow	*Sali sp*	R
Tufted Vetch	*icia cracca*	O
Wild Teasel	*ipsacus fullonum*	R
Yorkshire-fog	*Holcus lanatus*	D

Scattered Scrub

Common Name	Scientific Name	re uency
Apple	*alus domestica*	R
Ash	*Fra inus e celsior*	R
Autumn Hawkbit	*Scorzoneroides autumnalis*	O
Broad-leaved Willowherb	*Epilobium montanum*	R
Broom	*Cytisus scoparius*	R
Cat's-ear	*Hypochaeris radicata*	O
Cleavers	*Galium aparine*	F
Cock's-foot	*actylis glomerata*	O
Colt’s-foot	*Tussilago farfara*	R
Common Alder	*Alnus Glutinosa*	O
Common Bent	*Agrostis capillaris*	LF

Common Name	Scientific Name	re uency
Common Bird's-foot-trefoil	*otus corniculatus*	F
Common Centaury	*Centaurium erythraea*	R
Common Dandelion	*Tara acum officinale*	O
Common Hawthorn	*Crataegus monogyna*	R
Common Mouse-ear	*Cerastium fontanum*	F
Common Ragwort	*acobaea vulgaris*	O
Common Sorrel	*ume acetosa*	R
Compact Rush	*uncus conglomeratus*	R
Creeping Bent	*Agrostis stolonifera*	O
Creeping Buttercup	*anunculus repens*	O
Daisy	*ellis perennis*	R
Dove's-foot Crane's-bill	*Geranium molle*	R
False Fox-sedge	*Care otrubae*	R
Field Horsetail	*E uisetum arvense*	O
Glaucous Sedge	*Care flacca*	O
Gypsywort	*ycopus europaeus*	O
Hairy Sedge	*Care hirta*	R
Hairy Tare	*icia hirsuta*	R
Hard Rush	*uncus infle us*	R
Hoary Ragwort	*Senecio erucifolius*	O
Hop Trefoil	*Trifolium campestre*	O
Lesser Trefoil	*Trifolium dubium*	R
Meadow Buttercup	*anunculus acris*	O
Meadow Vetchling	*athyrus pratensis*	O
Northern Marsh-orchid	*actylorhiza purpurella*	R
Oxeye Daisy	*eucanthemum vulgare*	O
Pedunculate Oak	*uercus robur*	R
Poplar	*Populus alba*	F
Red Clover	*Trifolium pratense*	F
Red Fescue	*Festuca rubra agg*	F
Ribwort Plantain	*Plantago lanceolata*	F
Rough Meadow-grass	*Poa trivialis*	O
Rowan	*Sorbus aucuparia*	R
Scots Pine	*Pinus sylvestris*	R
Silver Birch	*etula Pendula*	F
Silverweed	*Potentilla anserina*	R
Soft Rush	*uncus effusus*	LF

Common Name	Scientific Name	re uency
Spear Thistle	*Cirsium vulgare*	R
Sweet Vernal Grass	*Antho anthum odoratum*	O
Timothy	*Phleum pratense sens lat*	O
Tufted Hair-grass	*eschampsia caespitosa*	O
Tufted Vetch	*icia cracca*	O
White Clover	*Trifolium repens*	O
Willow	*Sali fragilis*	F
Yarrow	*Achillea millefolium*	R
Yorkshire-fog	*Holcus lanatus*	F

Standing ater (estern Pond Edge)

Common Name	Scientific Name	re uency
Soft Rush	*uncus effusus*	A
Gypsywort	*ycopus europaeus*	F
Water Mint	*entha citrata*	LA
Bulrush	*Typha latifolia*	D
Field Horsetail	*E uisetum arvense*	R

APPENDIX C: STATIC RECORDER SUMMARY

Unit No.	Start Date	End Date	Survey Hours	Total Av. per hour	Total Registrations	Common Pipistrelle			Myotis Species			Soprano Pipistrelle			Noctule			Brown Long-eared		
						Period Total	Peak Count	Av. Per Hour	Period Total	Peak Count	Av. Per Hour	Period Total	Peak Count	Av. Per Hour	Period Total	Peak Count	Av. Per Hour	Period Total	Peak Count	Av. Per Hour
1	25/09/2019	30/09/2019	66:02:40	8.479	560	535	373	8.101	5	2	0.076	12	5	0.182	7	3	0.106	1	1	0.015
2	25/09/2019	30/09/2019	66:02:40	63.427	4189	3909	1342	59.187	237	144	3.588	42	28	0.636	0	0	0	1	1	0.015
		Totals:	132:05:20	35.953	4749	4444	1342	33.644	242	144	1.832	54	28	0.409	7	3	0.053	2	1	0.015

APPENDIX D: SUPPLEMENTARY REPORTS

Harworth Estates

oc ingham Business Par , Barnsley

Appendix 7.2 – Great Crested Newt Report

July 2016

PC Environment and esign Ltd
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ev	ssue Status	Prepared ate	pproved ate
-	Draft	JAT / 15.07.2016	RJS / 04.08.2016
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CONTENTS

1.0 INTRODUCTION 3

2.0 LEGISLATION 4

3.0 METHODOLOGY.....4

4.0 RESULTS.....7

5.0 DISCUSSION & RECOMMENDATIONS..... 10

TABLES

Table 1: HSI Scale

Table 2: Survey Conditions

Table 3: Results from 2013 and 2014 GCN Surveys

Table 4: HSI Results

Table 5: Great Crested Newt Survey Results

APPENDICES

Appendix A: HSI Scores

Appendix B: Aquatic Survey Results

FIGURES

Figure 1: Pond Location Plan

1.0 INTRODUCTION

1.1 The following report has been prepared by FPCR Environment and Design Ltd on behalf of Harworth Estates Ltd. and details the findings of great crested newt (GCN) *Triturus cristatus* surveys undertaken on a site adjacent to Shortwood Business Park, Barnsley. The need for further surveys of this group was identified during an initial habitat assessment carried out in April 2015.

Site Location and Context

1.2 The subject site is located adjacent to the west of Shortwood Business Park in Barnsley, South Yorkshire (central grid ref: SE356 010) and includes parcels of land to the north and south of the A6195 duel carriageway. The subject site consists of a former quarry restored to arable and improved pasture with associated native hedgerows and plantation broad-leaved woodland. An attenuation pond, drainage channel (partially culverted) and associated semi-improved grassland are in the southwest and further limited parcels of semi-improved grassland are associated with plantation margins.

1.3 In terms of surrounding habitats, the existing residential development of Birdwell is situated to the north west and to the south the more extensive residential area of Hoyland. Junction 36 of the M1 Motorway lies less than 600m to the west. The surrounding land use is largely arable and pasture with an area of broad-leaved semi-natural woodland to the north.

1.4 Two ponds are located within the site boundary (P1 and P1a) with a further four ponds (P2 – P5) located within 500m (Figure 1). Great crested newt surveys of these ponds were undertaken in 2013[1] and 2014[2] in support of a previous application.

Proposals

1.5 Proposals are for a mixed used development including B1, B2 and D1 uses.

1.6 The site boundary forms ‘Phase 2’ and ‘Phase 3’ of the wider development area (see Proposed Masterplan, Drawing No 12006-011). Works to ‘Phase 1’ of the development area have already commenced and include vegetation management and removal of existing earth mounds undertaken under appropriate GCN working methods. Earth removed from this area covered by this proposed application will be stored within the arable field compartment east of pond P2, within the site boundary (see Ecological Appraisal, Figure 2 – Phase 1 Habitat Plan)[3].

[1] AES 2013 Great Crested Newt Late Season Survey, Rockingham
[2] AES 2014 Survey and Assessment for Great Crested Newt (*Triturus cristatus*) and other Amphibian Species, Rockingham.
[3] FPCR 2016 Ecological Appraisal, Figure 2 – Phase 1 Habitat Plan.

2.0 LEGISLATION

2.1 GCN are afforded full legal protection under the Conservation of Habitats and Species Regulations 2010 (as amended) and the Wildlife & Countryside Act 1981 (as amended).

2.2 Under Regulation 41 of the Conservation of Habitats and Species Regulations 2010 (as amended) it is illegal to:

- Deliberately capture, injure or kill any wild animal of a European Protected Species (EPS);
- Deliberately disturb wild animals of an EPS (affecting ability to survive, breed or rear young) – disturbance of animals includes in particular any disturbance which is likely to impair their ability to survive, to breed or reproduce, or to rear or nurture their young;
- Deliberately disturb wild animals of an EPS (impairing ability to migrate or hibernate) disturbance of animals includes in particular any disturbance which is likely to impair their ability in the case of hibernating or migratory species to hibernate or migrate;
- Deliberately disturb wild animals of an EPS (affecting local distribution and abundance) – disturbance of animals includes in particular any disturbance which is likely to affect significantly the local distribution or abundance of the species to which they belong;
- Deliberately disturb wild animals of an EPS (whilst occupying a structure of place used for shelter or protection) – intentionally or recklessly disturb any wild animal while it is occupying a structure or place which it uses for shelter or protection;
- Damage or destroy a breeding site or resting place of a wild animal an EPS.

2.3 Under the Wildlife and Countryside Act 1981 (as amended) it is illegal to:

- Recklessly or intentionally kill, injures or take any wild animals included in Schedule 5;
- Recklessly or intentionally damage or destroy, or obstruct access to any structure or place which any wild animal included in Schedule 5 uses for shelter or protection;
- Recklessly or intentionally disturb any such animal while it is occupying a structure or place which it uses for shelter or protection.

3.0 METHODOLOGY

Desktop Study

3.1 In in order to compile existing baseline information regarding amphibians, relevant ecological information was requested from statutory and non-statutory nature conservation organisations, including:

- Sheffield Biological Records Centre (SBRC)
- Rotherham Biological Records Centre (RBRC)
- Natural England via the Multi Agency Geographic Information for the Countryside (MAGIC) interactive map (www.magic.gov.uk)

3.2 Further inspection, using colour 1:25,000 OS base maps (www.ordnancesurvey.co.uk) and aerial photographs from Google Earth (www.maps.google.co.uk), was also undertaken in order to

provide additional context and identify any features of potential importance for nature conservation in the wider countryside.

3.3 In addition data from previous great crested newt surveys of the site carried out during 2013 (AES 2013) and 2014 (AES 2014) in support of a previous application has also been included for contextual reference.

Field Study

abitat Suitability nde (S)

3.4 The site was walked in April 2015 and any waterbodies found within the site were noted and described along with any suitability to support GCN. Where access was granted, ponds within a 500m radius of the site were also surveyed and assessed for their suitability.

3.5 The assessment to determine the suitability of each pond for GCN was made using the HSI methodology, as developed by Oldham et al (2000)[4]. The HSI provides a measure of the likely suitability of a waterbody for supporting newts. This methodology assesses ponds against ten pre-determined criteria, producing a score that indicates suitability for GCN occupation. Generally, waterbodies with a higher score are more likely to support GCN than those with a lower score and there is a positive correlation between HSI scores and waterbodies with newts recorded. Ten separate attributes are assessed for each pond:

- Location (Area A, B or C within the UK);
- Pond Area (size in metres^2);
- Permanence (how many times it may dry out in a decade);
- Water quality (invertebrate diversity);
- Shade (percentage of a water bodies perimeter shaded);
- Fowl (impact of waterfowl if present);
- Fish (impact of fish if present);
- Pond Count (density of ponds within 1km);
- Terrestrial Habitat (quality of surrounding habitat); and
- Macrophytes (percentage of surface area occupied).

3.6 A score is assigned according to the most appropriate criteria level set within each attribute and total score calculated of between 0 and 1. Pond suitability is then determined according to the following scale.

[4] Oldham R.S., Keeble J., Swan M.J.S. & Jeffcote M. (2000). *Evaluating the Suitability of Habitat for the GC* (*Triturus cristatus*). Herpetological Journal 10 (4), 143-155.

Table 1 S Scale

S score	Pond Suitability
<0.5	Poor
0.5 - 0.59	Below average
0.6 – 0.69	Average
0.7 – 0.79	Good
>0.8	Excellent

uatic Surveys

3.7 A total of five waterbodies (P1, P2, P3, P4 and P5) were surveyed following the methods recommended by Natural England as detailed in the Great Crested Newt Mitigation Guidelines (English Nature, 2001) (the on-site P1a was dry during the survey period so could not be aquatically surveyed). To determine the presence or absence of great crested newts, four individual survey visits were performed. In ponds where GCN were recorded during the first four survey visits or where they have been recorded in previous years a total of six individual survey visits were undertaken. Appropriately licensed ecologists from FPCR completed all of these surveys during suitable conditions i.e. when the ambient air temperature exceeded 5°C, with little/no wind and no rain. Survey conditions for each occasion are detailed in Table 2.

Table 2 Survey Conditions

Survey ate	Survey Conditions					
	ind	ain	Evening temp (C)		orning temp (C)	
			ir pm	ater pm	ir am	ater am
01/05/2015	0	0	17	13	15	13
08/05/2015	0	0	11	9	9	9
15/05/2015	2	0	11	10	10	10
23/05/2015	4	2	11	12	9	12
04/06/2015	1	0	18	12	15	11
08/06/2015	2	0	13	10	8	8

3.8 On each survey occasion (if the presence of GCN had not previously been confirmed), three of a possible four different techniques (egg search, sweep net, bottle-trap and torch-light surveys) were used where possible. Where GCN had been confirmed guidance requires only two survey methodologies (bottle-trapping and torch-light) to be undertaken. A summary of all methodologies is provided below:

Bottle Trapping

3.9 Bottle traps were set within the water body in the evening at densities of one trap per two metres of shoreline (where feasible) and left overnight for inspection in the morning. Traps were partially submerged in the water leaving an air bubble in the bottle and secured by a cane marked with a high visibility tape to ensure relocation the following day. Care was taken to ensure that trapping

did not occur during excessively warm weather, when the temperature inside the trap could rise considerably, reducing oxygen levels and potentially suffocating the newts.

Sweep Netting

3.10 Long handled sweep-nets were used to sample the margins of the pond for GCN, with approximately 15 minutes of netting per 50m of shoreline.

Torch-Light Survey

3.11 Torching involved searching the water body after dusk using high-powered torches to scan the margins and potential display areas for newts. The perimeter of the pond was walked slowly to record any newts observed. Torch surveys are unsuitable within heavily vegetated and / or turbid ponds or after periods of heavy rain as visibility is diminished.

Egg Searching

3.12 Newts lay single eggs on leaves of aquatic plants or other suitable pliable material, after which the material is folded over the egg to protect it. GCN eggs can be distinguished from those of the other newts by their size, shape and colour. Submerged vegetation was examined for newt eggs and folded leaves gently opened to check for eggs. If a GCN egg had been identified, no further leaves would have been examined thereby minimising any further potential disturbance.

Survey Limitations

3.13 Aquatic surveys were not undertaken on pond P1a which was dry for the duration of the survey period (it is considered this was also the case in 2013 and 2014 when this waterbody was not surveyed).

3.14 Netting was undertaken in place of bottle trapping at ponds P1, P2, P3, P4 and P5 during survey visits where water levels were low (however, a minimum of three survey methods were always undertaken).

4.0 RESULTS

Desk Study

4.1 Full details of the desk study are provided in the separate ecological appraisal (FPCR 2015[5]). In summary, two records of GCN were returned for within 1km of the site boundary. These records were those recorded during previous surveys of the site in 2013 / 2014 by AES Ltd. These records / results are detailed in Table 3 below.

4.2 Smooth Newt *issotriton vulgaris*, Common Frog *ana temporaria*, and Common Toad *ufo bufo* were recorded c.60m north of the subject site within Shortwood Business Park (in Pond 5) in 2009. Common Frog and Smooth Newt were recorded within the on-site pond P1 in 2005; and Smooth Newt and Common Toad were recorded c.100m west of the subject site in 2005.

[5] FPCR 2015 Ecological Appraisal

Previous Survey

4.3 Surveys of the site were undertaken by Applied Ecological Services Ltd during 2013 and 2014 (AES Ltd[6]). A single great crested newt was recorded in pond P2 during 2014 with great crested newt nymphs also stated as being recorded in P1 during 2013 (although the photograph presented in the report appears to be inconclusive). Table 3 gives a summary of these results (the above pond numbers relate to FPCR nomenclature).

Table 3 esults from 2 13 and 2 1 CN Surveys

PC Pond	ES Pond	No. ndividuals						Presence bsence			
		CN		Smooth Ne t		nidentified Ne t		rog		Toad	
		2 13	2 1	2 13	2 1	2 13	2 1	2 13	2 1	2 13	2 1
P4	P1	-	-	-	55	-	-	Y	Y	-	-
P3	P2	-	-	-	8	-	-	-	-	-	-
P2	P3	-	1	-	66	-	-	Y	Y	Y	Y
P1	P4	Y*	-	6	44	-	2	Y	-	-	-
P5	Shortwood Pond	-	-	1	20	-	-	Y	Y	-	-

Nymphs observed

Pond Descriptions

Pond 1

4.4 A eutrophic attenuation pond (SE 3533 0080) located south of the A6195, within the site boundary (photograph 1), connected to land to the north via an underpass (photograph 1). Measuring approximately 40m by 10m and was characterised by an abundance of floating vegetation dominated by ivy-leaved duckweed *emna trisulca* and gently sloping margins dominated by common reed *Phragmites australis* together with abundant reed sweet-grass *Glyceria ma ima* and reedmace *Typha latifolia* Other flora noted included water forget-me-not *yosotis a uatic* and celery-leaved buttercup *anunculus sceleratus* A steep-sided drainage channel terminating at a culvert head at the north bank was dominated by water-cress *asturtium officinale*.

Pond 1a

4.5 A pooled section of ditch (SE 3553 0065), located within the site boundary, connected to P1 via a steep-sided wet ditch. Measuring approximately 6m^2 with steep margins and marginal aquatic flora limited to frequent reed-mace with open areas of water dominated by broad-leaved pondweed *Potamogeton natans*.

[6] AES Ltd 2013 *Great Crested e t ate Season Survey oc ingham* AES Ltd 2014 *Survey and Assessment for Great Crested e t Triturus cristatus and other Amphibian Species oc ingham*

Pond 2

4.6 An attenuation pond (SE 3523 0102) (photograph 2) located north of the A6195. Aquatic vegetation comprised reedmace and common reed. The pond has recently been re-profiled under outline planning consent and in agreement with the LPA (Barnsley Council). These works have since been completed.

Pond 3

4.7 An attenuation pond (SE 3525 0133) (photograph 3) linked to pond P4 via a drainage channel and culvert measuring 10m x 10m. Largely rainwater fed, vegetation was dominated by common reed and surrounding habitat characterised by tussocky grassland and dense scrub.

Pond

4.8 An attenuation pond located north of pond 3 (SE 3527 0142) (photograph 4). Largely rainwater fed pond with aquatic vegetation limited to sweet-grass *Glyceria* sp surrounded by tussocky grassland and scattered scrub.

Pond

4.9 An established balancing pond (SE 3561 0151) at Shortwood Business Park with reedmace and sweet-grass surrounded by tussocky grassland and dense scrub.

Habitat Suitability Index (HSI) Assessment

4.10 Table 4 provides a summary of the HSI assessment for all accessible ponds. Detailed HSI results are provided in Appendix A.

Table S Scores

Pond	S Score	Predicted Presence	S Category
1	0.49	3%	Poor
1a	Dry		
2	0.73	79%	Good
3	0.69	55%	Average
4	0.76	79%	Good
5	0.79	79%	Good

Terrestrial Habitat

4.11 To the north of the A6195 the site was divided between arable fields and plantation broad-leaved woodland. The arable habitats offered extremely limited suitability for GCN due to their exposed nature and lack of habitat structure. The plantation woodland comprised habitat of greater value providing potential connectivity between the ponds surrounding with potential habitat for sheltering and over-wintering. To the south of the A6195 the majority of the site was split between further areas of plantation broad-leaved woodland providing habitat of greater value and intensively managed improved grassland which was considered to be generally unsuitable for GCN. The remainder of the habitats included scrub, hedgerows and wet and dry ditches, all of

which had value providing potential sheltering and foraging habitat and links across the site and into the wider area.

Aquatic Surveys

4.12 Aquatic surveys were undertaken on ponds P1 - P5 during May and June 2015. No great crested newts were recorded during the surveys (Table 5). Smooth newts were recorded in ponds P1, P2 and P4 with a peak count of 9 recorded in pond P1 on the 8th May 2015. No other amphibians were recorded. Full survey results can be found in Appendix B.

Table reat Crested Ne t Survey esults

Pond Number	Total Count							
	CN		Smooth		Toad		rog	
	Num	Eggs	Num	Eggs	Num	eggs	Num	eggs
1	-	-	14	Y	-	-	-	-
1a	Dry							
2	-	-	1	-	-	-	-	-
3	-	-	-	-	-	-	-	-
4	-	-	2	-	-	-	-	-
5	-	-	-	-	-	-	-	-

(B=Bottle Trapping, T=Torching, N=Sweep Netting, E=Egg Search)

5.0 DISCUSSION & RECOMMENDATIONS

Ponds

5.1 Two ponds (P1 and P1a) were located within the site boundary with the remainder (P2 – P5) located in surrounding habitat within 500m. An ornamental pond located approximately 450m north of the site boundary (SE 3504 0167) was not subject to GCN surveys due to limited commuting habitat linking it to on-site habitats. Aquatic surveys were not undertaken on pond P1a as it was dry for the duration of the survey period.

Great Crested Newts

5.2 GCN nymphs were stated as being present within P1 during netting surveys in 2013 undertaken by AES; however, aquatic surveys completed by AES the following year and by FPCR in 2015 found no evidence of GCN during any of the survey occasions. It is therefore considered reasonably unlikely that GCN are present within this waterbody.

5.3 GCN were stated as being present within P2 during torching surveys by AES in 2014 where a single GCN was recorded. Following these surveys the LPA confirmed that works to ‘Phase 1’ of the development, including vegetation management, removal of existing earth mounds and profiling of P2, could be undertaken under precautionary method statement. In summary mitigation consisted of a ‘finger-tip’ search (prior to works surrounding the pond) of appropriate habitats within 60m of the pond. Cleared vegetation was either removed from site within 24hrs of clearance or raised on pallets, if cleared after this time, to remove any potential for creating GCN

hibernating habitat. The ponds, and areas of retained habitat, were protected for the duration through installation of fencing at the works boundary.

5.4 No GCN were found during works to 'Phase 1' of the development and the GCN surveys undertaken by FPCR in 2015 also observed no GCN. Based on this in conjunction with the results of previous survey it is considered likely that only a very small number of individual GCN are present within P2. It is therefore considered that mitigation measures on a similar scale to those undertaken for works surrounding P2 are appropriate for further future ground works / vegetation clearance within 100m of the pond, this is further detailed in 'Mitigation' below.

Other Amphibians

5.5 All common amphibian species are protected from sale by the Wildlife and Countryside Act 1981 (as amended). Common toad is listed as a Species of Principal Importance under Section 41 of the NERC Act 2006.

5.6 A small population of smooth newts were recorded in association with ponds P1, P2 and P4. The highest number was recorded in pond P1 with a peak count of nine, recorded on 8th May 2015. As all ponds are due to be retained no direct impacts on aquatic habitat for this species are anticipated.

5.7 No other common amphibian species were recorded during 2015. However common toad and common frog adults and tadpoles were observed in ponds P1, P2, P4 and P5 during 2013-14 surveys. Precautionary mitigation to avoid harm to any potential toads in the vicinity of pond P2 is included in the Mitigation section.

Mitigation

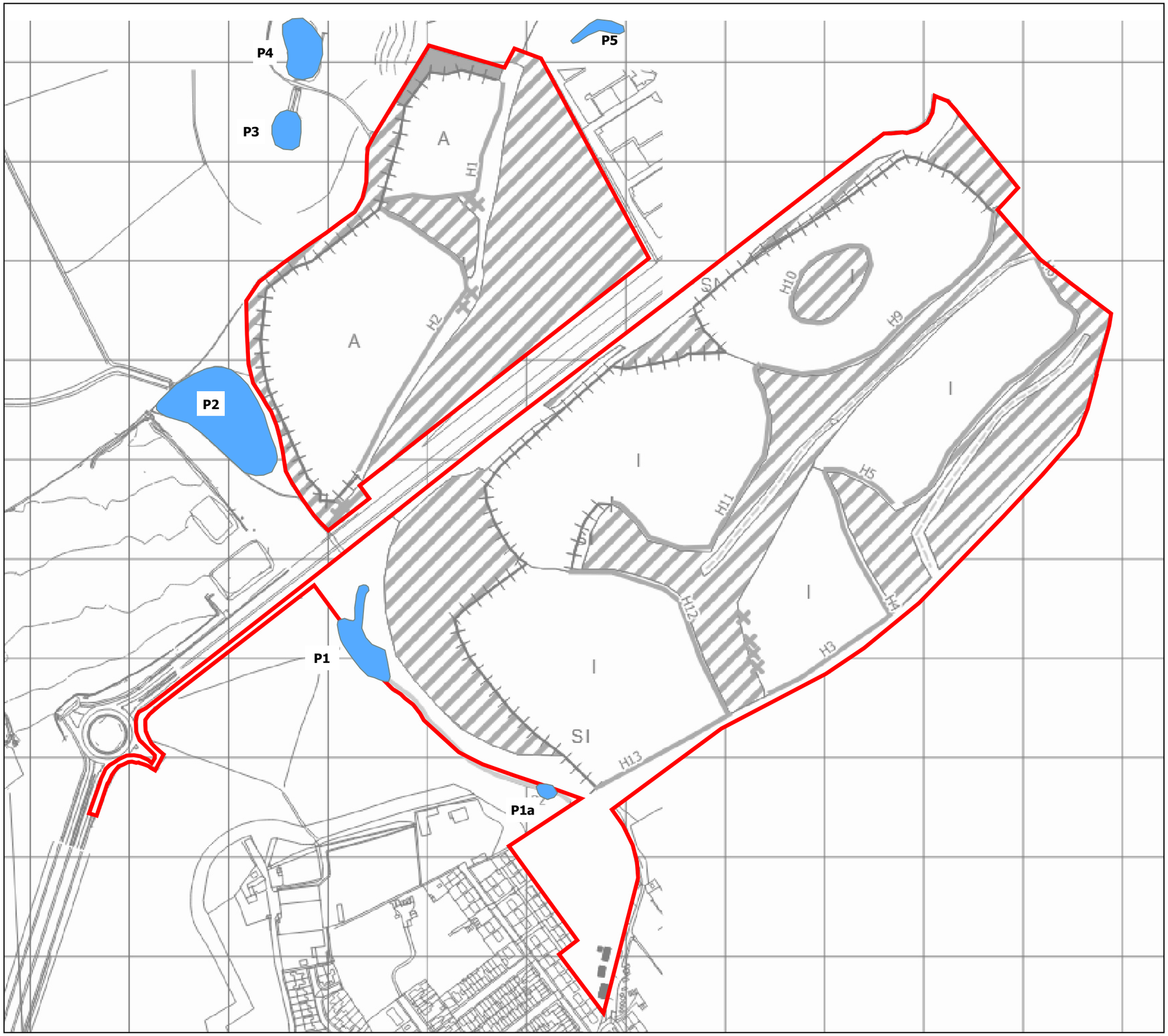
5.8 In order to ensure that no GCN or common amphibians are harmed as part of the proposals the following precautionary mitigation shall be implemented:

- Any areas proposed for works to habitats within 60 m of P2 shall be subject to a 'finger-tip' search by a qualified ecologist immediately prior to works commencing. This should take place outside of the hibernating season (typically November – February inclusive) and will include searching all areas that have the potential to be utilised by GCN (and common amphibian) such as scrub, tussocky grassland, woodland and any refuge or form of potential sheltering habitat. Vegetation should be removed within 24hrs and checked again if there is a delay past this period. In the event that GCN are found works will stop and advice sought from the LPA.
- To avoid creation of new habitat all vegetation should be removed from site, raised on pallets or centrally located within arable compartments to remove any potential for habitation and subsequent harm to these species.
- Protective fencing should be installed around all ponds and surrounding terrestrial habitat that will not be affected by the works to ensure that there are no direct impacts to these habitats. Fencing should remain in place for the duration of works and there should be no transgression of people or machinery past this point.

- No machinery / plant or construction material should be stored within fenced areas to avoid potential harm to GCN and all appropriate pollution-prevention measures shall be undertaken to ensure no adverse impacts upon any waterbodies.

5.9 It is understood that top soil removed from 'Phase 1' of the development shall be stored within the arable field compartment to the east of pond P2. To ensure this does not create new habitat suitable for GCN-use the earth should be compacted or raised off the ground. If this cannot be done it shall be subject to a 'finger-tip' search prior to its removal.

5.10 Transportation of earth onto site will require vehicles to track though plantation broad-leaved woodland to the south of P2. It is recommended that the route is finger-tipped searched prior to this and protective fencing installed either side to stop potential uncontrolled plant movement into surrounding woodland.



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Legend

Ponds

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masterplanning ▪ environmental assessment ▪ landscape design ▪ ecology ▪ architecture ▪ arboriculture ▪

Harworth Estates
Rockingham Business Park, Barnsley

Pond Location Plan

N

Scale: 1:4,000 JAT / JD 4/8/2016

Figure 1 **6424-E-01**

J:\6000\6424\QGIS\Plans\6424-E-2 Phase 1 Hbaitat Plan.qgs

APPENDIX A – HSI SCORES

Pond	S -1		S - 2		S -3		S -		S -		S -		S -7		S -		S -9		S -1		S Score	Pond Suitability	Predicted Presence
	eographical Location		Pond rea		Pond rying		ater uality		Shade (Perimeter)		ater o l		ish		Ponds ithin 1 m		Terrestrial abitat		acrophytes				
	Field result (A, B, C)	SI score	Field result (m2)	SI score	Field result	SI score	Field result	SI score	Field result (% cover)	SI score	Field result	SI score	Field result	SI score	Field result	SI score	Field result	SI score	Field result	SI score			
1	A	1	400	0.8	Never	0.9	Moderate	0.7	30	1	Major	0	possible	0.7	1	0.4	Moderate	0.7	70	1	0.49	Poor	3%
2	A	1	600	1	Sometimes	0.5	Poor	0.3	10	1	Minor	0.7	Absent	1	6	0.8	Moderate	0.7	45	0.8	0.73	Good	79%
3	A	1	600	1	Sometimes	0.5	Poor	0.3	10	1	Minor	0.7	Absent	1	6	0.8	Moderate	0.7	10	0.4	0.69	Average	55%
4	A	1	400	0.8	Rarely	1	Moderate	0.7	20	1	Minor	0.7	Minor	0.3	6	0.8	Moderate	0.7	80	1	0.76	Good	79%
5	A	1	300	0.6	Never	0.9	Moderate	0.7	25	1	Minor	0.7	possible	0.7	9	0.9	Moderate	0.7	90	0.9	0.79	Good	79%

APPENDIX B – AQUATIC SURVEY RESULTS

Pond Number	ethodology Employed	Survey ate	Evening air temp	ighest count					Egg Search
				CN	Smooth	Palmate	Toad	rog	
1	B,N,E	01/05/2015	10°	-	2	-	-	-	-
	B,N,E	08/05/2015	11°	-	9	-	-	-	-
	B,N,E	15/05/2015	16°	-	3	-	-	-	Smooth newt eggs
	B,T,E	23/05/2015	16°	-	-	-	-	-	-
1	Dry on all survey occasions								
2	B,N,E	01/05/2015	11°	-	-	-	-	-	-
	B,N,E	08/05/2015	11°	-	-	-	-	-	-
	B,N,E	15/05/2015	16°	-	-	-	-	-	-
	B,N,E	23/05/2015	16°	-	-	-	-	-	-
	B,N,E	04/06/2015	18°	-	-	-	-	-	-
	B,N,E,T	08/06/2015	13°	-	1	-	-	-	-
3	B,N,E	01/05/2015	17°		-	-	-	-	-
	B,N,E	08/05/2015	11°	-	-	-	-	-	-
	B,T,E	15/05/2015	16°	-	-	-	-	-	-
	B,N,E	23/05/2015	16°	-	-	-	-	-	-
	B,N,E	01/05/2015	11°	-	2	-	-	-	-
	B,N,E	08/05/2015	11°	-	-	-	-	-	-
	B,N,E	15/05/2015	16°	-	-	-	-	-	-
	B,N,E	23/05/2015	16°	-	-	-	-	-	-
	B,N,E	01/05/2015	11°	-	-	-	-	-	-
	B,N,E	08/05/2015	11°	-	-	-	-	-	-
	B,N,E	15/05/2015	16°	-		-	-	-	-
	B,N,E	01/05/2015	16°	-	-	-	-	-	-

Harworth Estates

oc ingham Business Par , Barnsley

Appendix 7.3 – Bat Survey Report

August 2016

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ev	ssue Status	Prepared ate	pproved ate	evie ed date
-	Draft 1	TPE 01.01.16	JD 19.09.2016	EJF/ 03.08.2016

CONTENTS

1.0 INTRODUCTION 2

2.0 METHODOLOGY 3

3.0 RESULTS & EVALUATION 11

4.0 DISCUSSION AND CONCLUSIONS 13

TABLES

Table 1: Classification and survey requirements for Bats in Trees

Table 2: Summary of Transect Survey Dates and Conditions

Table 3: Static Detector Survey Conditions and Locations

Table 4: Static Detector Results

FIGURES

Figure 1: Site Location and Consultation Results Plan

Figure 2: Phase 1 and Static Detector Location Plan.

Figure 3: Bat Transect Plan - Dusk 21st May 2015

Figure 4: Bat Transect Plan - Dusk 18th June 2015

Figure 5: Bat Transect Plan - Dusk 16th July 2015

Figure 6: Bat Transect Plan - Dusk 6th August 2015

Figure 7: Bat Transect Plan - Dusk 21st September 2015

Figure 8: Bat Transect Plan - Dawn 22nd September 2015

APPENDICES

Appendix A: Summary Transect Survey Results

Appendix B: Summary Static Survey Results

Appendix C: Detailed Transect Results Tables

1.0 INTRODUCTION

1.1 FPCR Environment and Design Ltd were commissioned by Harworth Estates to undertake a suite of bat surveys on land to the north and south of Dearne Valley Parkway (A6195). The objective of the study was to assess the potential implications to any bat populations using the site with development of a business park.

Site Location and Context

1.2 The subject site is located adjacent to the west of Shortwood Business Parkand comprises a parcel of land to the north and south across the A6195 duel carriageway, approximately 5km from Barnsley town centre, South Yorkshire (Central grid ref SE 352 009).

1.3 To the north / northwest lies arable farmland beyond which the existing residential development of Birdwell, to the northeast, Short Wood, to the east lies the existing development of Short Wood Business Park, to the south the more extensive residential area of Hoyland and to the east is an industrial development currently under construction. Junction 36 of the M1 Motorway lies around 800m to the west. The subject site consists of a former quarry restored to arable and improved pasture with associated native hedgerows and mixed plantation woodland. Two attenuation bodies, a drainage channel (partially culverted) and areas of associated semi-improved grassland are in the southwest and further limited parcels of semi-improved grassland are associated with plantation margins. The surrounding land use comprised largely arable and pasture with an area of broadleaved semi-natural woodland to the north.

Proposals

1.4 Proposals are for a business park development comprising warehousing with associated parking, lorry compounds and infrastructure.

2.0 METHODOLOGY

Desk Study

2.1 Rotherham Biological Records and Parks and Countryside Sheffield were consulted regarding bat records within 1km of the site. In addition to this, all statutory sites designated within 10km of the site were investigated to identify whether or not they were designated for their assemblage of bats.

Field Survey

Building ssessment

2.2 The exterior of any buildings present was visually assessed for potential access points and evidence of bat activity. Features such as small gaps under barge / soffit / fascia boards, raised or missing ridge tiles and gaps at gable ends, which have potential as access points / roost sites, were sought and the abundance of these access points was recorded. Evidence that bats actively used potential access points / roost sites includes staining within gaps and bat droppings or urine staining under gaps, a note being made wherever these were present. Indicators that potential access points / roost sites had not recently been used included the presence of cobwebs and general detritus within potential access points. The visual assessment was carried out following periods of dry weather to maximise recording of visible evidence.

2.3 The interior of the buildings, including its roof voids, was also visually assessed for evidence of bat activity and / or for the potential to be used by bats. Evidence of a roost was determined as the presence of a dead or live bat(s), concentrated piles or scattered droppings, food remains such as insect wing fragments as well as scratch marks and/or staining. In addition, any basement / cellar areas were also inspected for the above features.

Tree ssessment

2.4 Tree assessments were undertaken from ground level, with the aid of a torch and binoculars (where appropriate). During the survey Potential Roosting Features (PRF) for bats such as the following were sought (Based on P16, British Standard 8596:2015 *Surveying for bats in trees and oodland*, October 2015):

- Natural holes (e.g. knot holes) arising from naturally shed branches or branches previously pruned back to a branch collar.
- Man-made holes (e.g. cavities that have developed from flush cuts or cavities created by branches tearing out from parent stems).
- Woodpecker holes.
- Cracks / splits in stems or braches (horizontal and vertical).
- Partially detached, loose or bark plates.
- Cankers (caused by localised bark death) in which cavities have developed.
- Other hollows or cavities, including butt rots.
- Compression of forks with included bark, forming potential cavities.

- Crossing stems or branches with suitable roosting space between.
- Ivy stems with diameters in excess of 50mm with suitable roosting space behind (or where roosting space can be seen where a mat of thinner stems has left a gap between the mat and the trunk).
- Bat or bird boxes.
- Other suitable places of rest or shelter.

2.5 Certain factors such as orientation of the feature, its height from the ground, the direct surroundings and its location in respect to other features may enhance or reduce the potential value.

2.6 Trees were classified into general bat roost potential groups based upon the presence of these features. Table 1 (overleaf) broadly classifies the potential categories as accurately as possible as well as discussing the relevance of the features. This table is based upon Table 4.1 and Chapter 6 in *at Surveys for Professional Ecologists Good Practice Guidelines* (Bat Conservation Trust 2016).

2.7 Although the British Standard 8596:2015 document groups trees with moderate and high potential, these have been separated below (as per Table 4.1 in The Bat Conversation Trust Guidelines) to allow more specific survey criteria to be applied.

Table 1 Classification and Survey e uirements for Bats in Trees

Classification of Tree	escription of Category and ssociated eatures (based on Potential oosting eatures listed above)	Li ely urther Survey or ctions
Confirmed Roost	Evidence of roosting bats in the form of live / dead bats, droppings, urine staining, mammalian fur oil staining, etc.	A Natural England derogation licence application will be required if the tree or roost site is affected by the development or proposed arboricultural works. This will require a combination of aerial assessment by roped access bat workers (where possible, health and safety constraints allowing) and nocturnal survey during appropriate periods (e.g. nocturnal survey - May to August) to inform on the licence. Works to tree undertaken under supervision in accordance with the approved good practice method statement provided within the licence. However, where confirmed roost site(s) are not affected by works, work under a precautionary good practice method statement may be possible.

Classification of Tree	escription of Category and ssociated eatures (based on Potential oosting eatures listed above)	Li ely urther Survey or ctions
High Potential	A tree with one or more Potential Roosting Features that are obviously suitable for larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter protection, conditions (height above ground level, light levels, etc). Examples include (but are not limited to); woodpecker holes, larger cavities, hollow trunks, hazard beams, etc.	Aerial assessment by roped access bat workers (if appropriate) and / or nocturnal survey during appropriate period (May to August). Following additional assessments, tree may be upgraded or downgraded based on findings. If roost sites are confirmed and the tree or roost is to be affected by proposals a licence from Natural England will be required. After completion of survey work (and the presence of a bat roost is discounted), a precautionary working method statement may still be appropriate.
Moderate Potential	A tree with Potential Roosting Features which could support one or more potential roost sites due to their size, shelter protection, conditions (height above ground level, light levels, etc) and surrounding habitat but unlikely to support a roost of high conservation status (i.e. larger roost, irrespective of wider conservation status). Examples include (but are not limited to); woodpecker holes, rot cavities, branch socket cavities, etc.	A combination of aerial assessment by roped access bat workers and / or nocturnal survey during appropriate period (May to August). Following additional assessments, tree may be upgraded or downgraded based on findings. After completion of survey work (and the presence of a bat roost is discounted), a precautionary working method statement may still be appropriate. If a roost site/s is confirmed a licence from Natural England will be required.
Low Potential	A tree of sufficient size and age to contain Potential Roosting Features but with none seen from ground or features seen only very limited potential. Examples include (but are not limited to); loose/lifted bark, shallow splits exposed to elements or upward facing holes.	No further survey required but a precautionary working method statement may be appropriate.
Negligible/No potential	Negligible/no habitat features likely to be used by roosting bats	None.

* The Conservation of Habitats & Species Regulations 2010 (as amended) affords protection to “breeding sites” and “resting places” of bats. The EU Commission’s Guidance document on the strict protection of animal species of Community interest under the Habitats Directive 92/43/EEC, February 2007 states that these are places “where there is a reasonably high probability that the species concerned will return”.

2.8 The assessment of trees and buildings was completed by a suitably experienced bat worker on the 8th of June 2015.

Transect Survey

2.9 The site was assessed as having a low/moderate potential to bats, and therefore monthly surveys were proposed as recommended by Bat Conservation Trust (2012) Bat Surveys- Good Practice Guidelines 2nd edition[1]. Dusk surveys were therefore completed within the site boundary in April, May, June, July, August and September with a pre-dawn survey also undertaken in September.

2.10 The transect routes were determined prior to the surveys being completed, paying particular attention to linear features. Such features included hedgerows / tree lines, and natural features such as watercourses and areas of scrub, which are often used by foraging and commuting bats. Suitable habitats within the survey area included grassland, plantation woodland, hedgerows and waterbodies. To cover the habitats within the site, a single transect route was walked by licensed/experienced bat workers. On each of the survey occasions the transect was either started at least 15mins prior to sunset and continued until at least 2hr following sunset or began 2 hours prior to sunrise and continued until at least 15mins following sunrise.

2.11 The transects were walked at a steady pace and when a bat passed by, the species, time and behaviour was recorded on a site plan. Bat box© Ltd Duet bat detectors were utilised in conjunction with MP3 recorders to provide back-up information and enable field identification of bats encountered.

2.12 The transect surveys included a number of point counts. Each point count was 5 minutes in duration during which time all bat activity was recorded. The point counts were strategically located throughout the site to ensure a comprehensive coverage of habitats present.

2.13 Post-survey, bat calls were analysed using BatSound© (version 4.1.4), by taking measurements of the peak frequency, inter-pulse interval, call duration and end frequency. From this, the level of bat activity across the site in relation to the abundance of individual species foraging and commuting along habitats was assessed.

2.14 These transects were undertaken in periods of good weather i.e. an ambient temperature of at least 10°C, with little/no wind and rain.

2.15 A summary of the conditions for each survey is shown in Table 2 below:

[1] Bat Conservation Trust, Bat Surveys (2012) Good Practice Guidelines 2nd Edition.

Table 2 Summary of Transect Survey ates and Conditions

ate (dus survey unless other ise stated)	Sunset Sunrise	Start finish time	Temperature	ain	ind (Beaufort)	Cloud Cover
Survey 1- 21/05/2015	21:09	20:54	13^{0}C	1	0	100
Survey 2 - 18/06/2015	21:31	21:16	15^{0}C	0	2	60
Survey 3- 16/07/2015	21:26	21:11	14^{0}C	0	1	20
Survey 4 - 06/08/2015	20:53	20:38	16^{0}C	0	1	0
Survey 5a - 21/09/2015	19:08	18:53	12^{0}C	0	1	30
Survey 5b- 22/09/2015	06:08	04:08	10^{0}C	0	0	50

(Wind levels were assessed using the Beaufort scale – B0 – less than 1 mph, B1 – 1-3mph, B2 – 4-7mph, B3 – 8-12mph, B4 – 13-18mph, B5 – 19-24mph)

Static etector Survey

2.16 A number of static passive recording broadband detectors were deployed on site to supplement the manual transect surveys through passive recording as recommended in the guidance document Bat Conservation Trust (2012) Bat Surveys- Good Practice Guidelines 2nd edition[2] and in the European Guidelines (Rodrigues *et al*. 2008). This information was used to derive an index of activity at different points within the site.

2.17 The model of automated detectors used were AnaBat™ SD1 (Titley™ Scientific). Detectors were programmed to activate 30 minutes before dusk and recorded continuously until 30 minutes following sunrise.

2.18 In accordance with the guidance a static detector was placed on-site monthly (in May, June, July, August and September). See Table 3 for survey conditions and deployment dates and Figure 3 for static location each month (locations chosen to provide an appropriate representation of the on-site habitats).

2.19 The recorded data was analysed using AnaLookW© software (Titley™ Scientific) to assess the amount of bat activity on site by recording the number of bat registrations.

[2] Bat Conservation Trust, Bat Surveys (2012) Good Practice Guidelines 2nd Edition.

Table 3 Static etector Survey Conditions

Survey ef ate	rea	Conditions
Static Detector Survey 1 - 21st – 25th May	Two locations / units – the first located centrally within the northern part of the site at the edge of semi-mature woodland bordering an arable field with the second situated centrally within the southern compartment in a small gap between two areas of semi-mature woodland within bovine grazed pasture.	Desktop data indicates that there was no rain during this period and although temperatures did occasionally drop and wind sometimes got a little high, the majority of the survey period was suitable
Static Detector Survey 2 - 9th – 14th June	Two locations / units – the first located just north of the centre of the northern compartment at the end the edge of semi-mature woodland bordering an arable field with the second located centrally within the southern compartment on the edge of semi-mature woodland / bovine grazed pasture.	Desktop data indicates that there was very light rain during this period with occasional moderate rain and temperatures whilst occasionally dropping to below optimum, were predominantly suitable.
Static Detector Survey 3 - 8th -12th July	Two locations / units – the first located on the edge of semi-mature woodland towards the south of the site bordering bovine grazed pasture, the second situated along the western edge of site on the edge of semi-mature woodland bordering rank grassland.	Desktop data indicates that there was occasional light rain during this warm period and whilst occasional high wind was present, this was not considered to be a limiting factor.

Survey ef ate	rea	Conditions
Static Detector Survey 4 - 4th – 9th August	Two locations / units – the first located at the extreme northern end of the site located on the edge of semi-mature woodland adjacent to a previously developed area with the second located centrally towards the northern boundary of the southern part of the site on the edge of semi-mature woodland / bovine grazed pasture.	Desktop data indicates that there wasno rain during this period with occasional moderate winds with overall warm temperatures.
Static Detector Survey 5 - 15th – 19th September	Two locations / units – the first located along the north western boundary within an area of semi-mature woodland / scrub with the second located along the north eastern boundary on the edge of semi-mature woodland / bovine grazed pasture.	Desktop data indicates that there was occasional very light rain, occasional low winds and a moderate average temperature during this period.

Survey Limitations

2.20 Many of the surveys conducted on site were undertaken under guidance (BCT 2012) which has since been superseded (BCT, 2016). Where appropriate (such as trees) methods have been retrospectively altered, but in some cases this was not possible (transects, statics). However although minor variations are present within the methodologies, given the broad similarities in working methods between the two editions, the current data is considered to be an accurate representation of the local bat population.

2.21 In departure from guidance and after consultation with the Local Authority Ecologist, only 5 visits for statics and transects were undertaken monthly between May and September. The rationale was based on the data recorded on previous surveys, the sites location and conditions, which meant an October survey was considered to be of low value and therefore not undertaken. However although 1 survey is missing from the data set, this is not considered to be a constraint.

2.22 During the June static detector survey one of the units failed due a to technical fault. It was considered however that the lack of data resulting from this did not affect the overall assessment of the bat assemblage using the site due to all other units being successful as well as a comprehensive suite of transect surveys all undertaken under suitable conditions.

2.23 The passive recording units do not discern between individual bats or a single bat passing the microphone several times and therefore the data recorded can only provide an indication of bat activity as bat registrations per unit time.

3.0 RESULTS & EVALUATION

Desk Study (Figure 1)

3.1 Rotherham Biological Records provided details of several bat sightings within the local area including soprano pipistrelle *Pipistrellus pygmaeus*, brown long-eared *Plecotus auritus*, Leislers *yctalus leisleri* and noctule *yctalus noctula* along with unidentified *Pipistrelle* and *yctalus* species. Two records for soprano pipistrelle bat roosts (possibly the same roost) were identified within the consultation results however both of these were 15 years old and located at Worsborough Hall situated around 1.5km north from site where a single brown long-eared and an unidentified bat species were also recorded. Records exist for individual species closer to the site for a common pipistrelle and a noctule with both of these records being from 2004 located at Shortwood Business Park, around 50m to the east of the site boundary. Other historic records exist however none of these are considered to be pertinent due to both the age of the record and the distance from site.

Field Surveys

eneral Site ssessment (See igure 2 – Phase 1 Plan)

3.2 Habitats within the site boundary were considered to provide 'low-medium' quality in relation to value for bat commuting and foraging (following BCT's assessment methodology) comprising predominantly of open pasture with areas of immature plantation woodland and two small waterbodies which were considered to provide sub-optimal foraging habitat for species often associated with water such as Daubenton's and Natterer's. Connectivity through the site was considered to be poor due to the well-lit A6195 centrally bisecting the site which is largely considered to prevent commuting in a north / south direction apart from by high flying species, chiefly noctule. Commuting within the northern and southern portions was considered to be good however due to the reasonably well connected linear features of the plantation and occasional hedgerows.

Building ssessments

3.3 A total of four buildings B1, B2, B3 and B4 were present within an area of horse grazed pasture to the extreme south of the site, all of which were predominantly corrugated metal horse shelters none of which offered any potential to support roosting bats beyond perhaps occasional feeding roosts however the lack of prey remains suggested that they were not used for this purpose.

ssessment of Trees

3.4 No trees were present on site that offered any roosting potential for bats, due to the relatively young age of all of the trees and consequent lack of features.

Transect Surveys

3.5 The following sections are a summary of the data recorded during the activity surveys in 2015. Further detail is provided in the attached Figures (Figures 3-9) and appendices (Appendix A)

Survey 1 - Dusk Transect 21st May 2015 (Figure 4 and Appendix A&C)

3.6 During the survey a total of 17 bat contacts were recorded with 15 of these being recorded during the walked part of the survey and the remaining 2 during point counts. Only 1 species was accurately identified, this being common pipistrelle *Pipistrellus pipistrellus* and an unknown *yctallus* species, most probably noctule *yctalus noctula* All bats were recorded evenly throughout the southern part of the site however only 2 passes were recorded within the northern part of the site.

3.7 No bats were recorded in the location of PC1 – PC8.

Survey 2 - Dusk Transect 18th June 2015 (Figure 5 and Appendix A&C)

3.8 During the survey a total of 3 bat contacts were made with 2 of these being recorded during the walked part of the transect with the other, of the *yotis* genus which couldn't be identified to species level recorded during PC8.

3.9 All three passes were recorded within the southern part of the site however given such a low number of contacts it is not considered that any conclusions can be drawn from this.

Survey 3 - Dusk Transect 16th July 2015 (Figure 6 and Appendix A&C)

3.10 During the survey a total of 14 bat passes were recorded with 13 of these being passes from common pipistrelle bats and a single pass from a *yctalus* species believed to be a noctule.

3.11 Passes were reasonably evenly distributed through the site however there was a slight concentration in the southernmost cattle grazed field from an unknown *yctalus* and two passes from common pipistrelles.

Survey 4 - Dusk Transect 6th August 2015 (Figure 7 and Appendix A&C)

3.12 Four bat passes were recorded, all of which were from common pipistrelles with two of these being recorded during the transect and another two during point counts.

3.13 Although such low number of bats prevented an accurate assessment of distribution impossible, three of the contact were centred around PC7 however this may have been the same bat due to the timings being very close together and all from common pipistrelle.

Survey 5 - Dusk Transect 21st September 2015 (Figure 8 and Appendix A&C)

3.14 During the dusk transect 4 bat passes were recorded, all from common pipistrelles. All passes were again recorded within the southern section of the site however as previously mentioned, such low numbers of recordings from common species do not provide useable data in identifying areas of high activity.

Survey 6 - Dawn Transect 22nd September (Figure 9 and Appendix A&C)

3.15 No bats were recorded during this survey despite conditions being considered to be suitable. No explanation can be given for the complete lack of passes with equipment checked post survey and found to be in perfect working order.

3.16 Given the previously low – very low number of registrations, no passes is not considered to be particularly notable.

Summary

3.17 During the surveys bat activity ranged from between 17 passes during the first, May, survey and 0 during the final September Dawn Survey. Overall only common pipistrelle was identified to species level however passes from *yctalus* and *yotis* species were also recorded. Whilst they couldn't be identified to species level they were strongly believed to be noctule and Daubenton's *yotis daubentonii* Although such low numbers of bats were recorded to render the peak areas of activity to be largely academic, the southernmost cattle grazed area had the highest number of contacts whilst the whole of the site north of the road presented very little bat activity.

Static etector Survey

3.18 The following text summarises the results of the static detector recording devices. Two static detectors were deployed during each survey occasion. The locations of the detectors can be seen on the Static Detector Location Plan (Figure 10).

Static survey 1 - 21st - 2 th ay – etectors 1 2

3.19 During the May static survey period static unit 1 recorded a total number of 1237 registrations with species / species groups including common pipistrelle (1117 registrations), soprano pipistrelle (2 registrations) and Noctule (14 registrations).

3.20 During this period static unit 2 recorded a total of 278 registrations with species / species groups including common pipistrelle (241 registrations), soprano pipistrelle (1 registrations) and Noctule (5 registrations).

3.21 Unidentifiable *yctalus* species and a single pass from an unidentifiable (due to the low quality of the recording) pipistrelle species but believed to be either a common or a soprano pipistrelle were also recorded.

Static survey 2 - 9th - 1 th une – etectors 3

3.22 During the June survey one of the units deployed, unit 4, failed to record any bat passes however following retrieval no technical errors were identified with the unit. The second unit recorded 317 registrations from common pipistrelle (295), noctule (2) and a single pass from a soprano pipistrelle. A number of passes from unidentifiable *yctallus myotis* and pipistrelle species were recorded.

Static survey 3 - th - 13th uly etectors

3.23 During the July static survey period, static unit 5 recorded a total of 356 registrations with species / species groups including common pipistrelle (326 registrations), soprano pipistrelle (15 registrations) along with 2 unknown *yotis* species and a single unknown pipistrelle species.

3.24 Unit 6 recorded a total of 47 registrations with species / species groups including common pipistrelle (36 registrations) and 11 unknown *yctalus* registrations. No other species / unidentifiable records were recorded.

Static survey - th - 1 th ugust etectors 7

3.25 During the August static survey period, static unit 7 recorded a total of 696 registrations with species / species groups including common pipistrelle (652 registrations), soprano pipistrelle (12 registrations), two noctule, a single brown long-eared *Plecotus auritus*, 21 unidentifiable N*yctalus* species, 4 *yotis* species and 3 unknown pipistrelle species.

3.26 During the August static survey period, static unit 8 recorded a total of 276 registrations with species / species groups including common pipistrelle (268 registrations) and 8 unidentifiable N*yctalus* species.

Static survey - 1 th – 2 th September etectors 9 1

3.27 During the September static survey period, static unit 9 recorded a total of 170 registrations with species / species groups including common pipistrelle (128 registrations), soprano pipistrelle (27 registrations), 9 unidentifiable N*yctalus* species and 6 *yotis* species.

3.28 During the September static survey period, static unit 10 recorded a total of 580 registrations with species / species groups including common pipistrelle (460 registrations), soprano pipistrelle (9 registrations), 107 unidentifiable N*yctalus* species, 3 *yotis* species and a single unknown pipistrelle species.

Summary

3.29 During the surveys the greatest levels of activity were recorded on static detector number 1 during the first, May, survey with a total of 1237 registrations with the lowest, aside from detector 4 in June which did not register a single pass, being recorded from detector 6 in July which received 47 registrations.

3.30 The total numbers of bats recorded during the survey period from all species is as follows:

- Common pipistrelle – 3523
- Nyctalus species – 318
- Soprano pipistrelle – 67
- Noctule – 24
- Myotis species – 15
- Pipistrelle species – 9
- Brown long-eared – 1

Notes

3.31 Where calls could not be identified to species level, for example due to the lower quality of those recordings or where there are similarities between species echolocation calls (particularly for *yotis* and *yctalus* species) making a definite identification difficult, a likely species identification is provided. This is based on the features displayed by the calls when analysed using the Ana look data analysis software package and taking in to account the geographical location of the site and the habitats present. It was therefore considered that:

- *Pipistrelle* species were either common or soprano pipistrelle bats;
- *yotis* species were likely to be largely Daubenton's bats either foraging or commuting
- *yctalus* species bats were likely to be noctule bats however although reasonably unlikely, Leislers could not categorically be ruled out.

3.32 It should be noted that individual bats cannot be identified and it is impossible to ascertain whether a set of results from the same species has been obtained from numerous individual bat registrations or from a single bat repeatedly calling in the vicinity of the detector therefore the results should be considered as a relative measure of abundance.

Tables – Static etector esults

ecording Period	nit Number	Survey ates	Survey ours	Total vg.per hour	Total egistrations	Common Pipistrelle			Nyctalus Species			Soprano Pipistrelle		
						Avg.per hour	Peak Count	Period Total	Avg.per hour	Peak Count	Period Total	Avg.per hour	Peak Count	Period Total
May	3	21/05/2015 - 26/05/2015	46	26.59	1237	24.01	622	1117	2.17	62	101	0.04	2	2
May	4	21/05/2015 - 26/05/2015	46	5.98	278	5.18	159	241	0.67	19	31	0.02	1	1
Jun	7	09/06/2015 - 15/06/2015	50	6.27	317	5.83	114	295	0.36	9	18	0.02	1	1
Jun	0		0	0.00	0	0.00	0	0	0.00	0	0	0.00	0	0
Jul	1	08/07/2015 - 13/07/2015	45	7.91	356	7.24	114	326	0.27	6	12	0.33	7	15
Jul	7	09/07/2015 - 13/07/2015	37	1.26	47	0.97	18	36	0.30	4	11	0.00	0	0
Aug	4	04/08/2015 - 10/08/2015	61	11.36	696	10.64	178	652	0.34	9	21	0.20	7	12
Aug	5	04/08/2015 - 07/08/2015	34	8.07	276	7.84	216	268	0.23	4	8	0.00	0	0
Sep	6	15/09/2015 - 20/09/2015	68	2.50	170	1.88	47	128	0.13	4	9	0.40	15	27
Sep	7	15/09/2015 - 20/09/2015	68	8.53	580	6.76	213	460	1.57	86	107	0.13	5	9
		Total	458	8.63	3957	7.68	622	3523	0.69	86	318	0.15	15	67

ecording Period	nit Number	Survey ates	Survey ours	Total vg.per hour	Total egistrations	Noctule			Myotis Species			Pipistrelle Species			Brown Long-eared		
						Avg.per hour	Peak Count	Period Total	Avg.per hour	Peak Count	Period Total	Avg.per hour	Peak Count	Period Total	Avg.per hour	Peak Count	Period Total
May	3	21/05/2015 - 26/05/2015	46	26.59	1237	0.30	13	14	0.00	0	0	0.06	1	3	0.00	0	0
May	4	21/05/2015 - 26/05/2015	46	5.98	278	0.11	3	5	0.00	0	0	0.00	0	0	0.00	0	0
Jun	7	09/06/2015 - 15/06/2015	50	6.27	317	0.04	1	2	0.00	0	0	0.02	1	1	0.00	0	0
Jun	0		0	0.00	0	0.00	0	0	0.00	0	0	0.00	0	0	0.00	0	0
Jul	1	08/07/2015 - 13/07/2015	45	7.91	356	0.00	0	0	0.04	2	2	0.02	1	1	0.00	0	0
Jul	7	09/07/2015 - 13/07/2015	37	1.26	47	0.00	0	0	0.00	0	0	0.00	0	0	0.00	0	0
Aug	4	04/08/2015 - 10/08/2015	61	11.36	696	0.05	2	3	0.07	2	4	0.05	1	3	0.02	1	1
Aug	5	04/08/2015 - 07/08/2015	34	8.07	276	0.00	0	0	0.00	0	0	0.00	0	0	0.00	0	0
Sep	6	15/09/2015 - 20/09/2015	68	2.50	170	0.00	0	0	0.09	2	6	0.00	0	0	0.00	0	0
Sep	7	15/09/2015 - 20/09/2015	68	8.53	580	0.00	0	0	0.04	2	3	0.01	1	1	0.00	0	0
		Total	458	8.63	3957	0.05	13	24	0.03	2	15	0.02	1	9	0.00	1	1

4.0 DISCUSSION AND CONCLUSIONS

Site Habitats

Assessment

Trees

4.1 Ground based assessments of the trees were made, during which no features suitable to support bats were recorded largely due to the species of trees and their immaturity.

4.2 As such bats within trees need not be considered further and arborecultural works can take place without the need for further survey nor supervision of works.

4.3 In terms of other activity, the majority of bat contacts both visual and audible were made in the vicinity of the trees and so this should be considered during masterplanning.

4.4 It should be noted that the trees on-site were considered to potentially provide commuting routes for bats and as such where possibly linear tree lines should be retained. Where such features cannot be incorporated into the masterplan, replacing them within the development to provide commuting features of the same orientation should be considered.

Buildings

4.5 A total of four buildings B1, B2, B3 and B4 were present within an area of horse grazed pasture to the extreme south of the site, all of which were predominantly corrugated metal horse shelters none of which offered any potential to support roosting bats beyond perhaps occasional feeding roosts however the lack of prey remains suggested that they were not used for this purpose.

4.6 During the building inspections no evidence of bats was recorded nor was there considered to be any potential for the structures to support roosting bats.

4.7 As such bats are not considered to pose a constraint to the removal of any of the on-site buildings.

Bat ctivity

Transects

4.8 In accordance with BCT best practice, monthly transects were undertaken upon the site and due to the size of the survey area, a single transect route was able to adequately cover all habitats.

4.9 During the extensive survey effort, bat levels of activity ranged from no contacts during the September dawn survey to a maximum of 17 bat contacts during the May survey with an average number of bats recorded per transect being 7 passes, all from common and wide spread species.

4.10 The southern section of the site returned the highest number of bat passes most probably due to the southern area being larger and having greater foraging resources owing to the proximities of waterbodies as well as large numbers of cattle which attract invertebrate pray.

4.11 Given the time length of the transects and the amount of survey time per transect, the levels of activity on-site were not considered to be significant.

4.12 A single species of bat was accurately recorded during the transect surveys, common pipistrelle which totalled 38 passes. A single pass from a *yotis* species was also recorded, believed to be a Daubenton's bat along with 3 *yctalus* species all of which were believed to be Noctule.

4.13 The surveys were undertaken in an attempt to identify areas of peak activity however due to the scarcity of records and their even distribution through the site, no areas were considered notable due to the high levels of bat passes.

4.14 Based upon the transect findings it is considered that the majority of the habitats on-site have some limited potential to support foraging and commuting bats however the lack of areas of peak activity and low overall contacts indicate generally a low usage of the site by bats, both in terms of overall numbers of bats as well as the individual species.

4.15 No rare or notable species were recorded during the transect surveys.

4.16 Following on from discussions with Barnsley Metropolitan Borough Council Biodiversity Officer, Trevor Mayne, it was proposed that due to the very low levels of activity recorded during both transect and static detector surveys, survey effort (both transect and static) could be reduced to 5 survey occasions for each as it was believed that very little if any additional information would be gained from additional survey effort.

Statics

4.17 The static dataset broadly supports the findings of the transects with the highest number of registrations also being made in May with 1515 registrations between the two detectors. The lowest number of passes was during the June transect with 317 passes.

4.18 During the static detector surveys, 4 species of bat were recorded and identified from 3,957 passes. Common pipistrelle with 622 passes, 67 soprano pipistrelle, 24 noctule and a single brown long-eared. The remaining passes were from three groups of bats (which couldn't be identified to species level), *yctalus yotis and Pipistrelle* with 318, 15 and 9 passes respectively.

4.19 The highest levels of data were recorded from detectors 1 and 2 which were roughly central within each of the northern and southern compartments. The lowest levels of data were returned from the June recording located at points 3 and 4 which were roughly in similar places to units 1 and 2. As conditions were suitable during the June survey period the most plausible explanation for the discrepancies between the number of bats is that units 1 and 2 were placed upon commuting routes / areas of high insect populations whereas units 3 and 4 were not placed in the vicinity of such features.

4.20 No rare or notable species were recorded during the automated detector surveys and it should be noted that registrations recorded on static bat detectors could potentially relate to either several registrations of one bat or single registrations of several bats and cannot be distinguished due to the method of data collection. Therefore, the static detector data results need to be interpreted with reference to other survey occasions and methods. The levels of activity recorded during all static detector surveys were somewhat higher than that of the transect surveys however it was noted that on the transect surveys there was relatively high levels of activity from small numbers of bats constantly foraging along certain features, hedgerows for example. As such, it is likely that the bats recorded during the static detector periods were also small numbers of bats foraging

for a prolonged period of time and therefore producing many registrations on the detector recordings.

Summary

4.21 Taking into account the above data collected from both transect and static surveys, the features considered to be of greatest value to bats is the southernmost field compartment of the southern part of the main site. That being said, even the peak levels of activity were considered to be so low as to raise doubt as to the value of these areas and it is considered more likely that the higher levels of bats has arisen by chance as opposed to numbers of bats regularly using the same routes. The species recorded during both surveys is considered to be unremarkable both in terms of overall bat numbers and the species recorded with both the levels of activity and individual species present being typical of both the local and wider area. That being said, an assemblage of bats was recorded and the site did hold value for this group, albeit limited.

Potential mpacts

4.22 As a result of the proposals the following will likely result in

- Clearance of on-site compartments to make room for developments;
- Removal of larger sections of hedge to facilitate main infrastructure roads;
- Potential disturbance from inappropriate lighting schemes onto linear features of interest;

Mitigation and Enhancement

4.23 The following section outlines the recommendations for mitigation, compensation and enhancement.

4.24 The National Planning Policy Framework (NPPF) places emphasis on sustainable development, and minimising impacts on biodiversity whilst providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity. Opportunities to incorporate biodiversity in and around developments should therefore be encouraged.

4.25 Proposals should therefore focus on ensuring that as little foraging habitat as possible is removed, lighting and noise are both kept to a minimum and where possible habitats are enhanced to improve their ability to support invertebrates. Connectivity through the site should be maintained and enhanced where possible, particularly the boundary habitats and hedgerows which should not be breached if possible. Lighting will be implemented as part of the development. All species of bats are sensitive to artificial light and will avoid well lit areas.

4.26 Although no trees within the site offered any potential to support roosting bats, some invertebrate prey will be created by them as well as the foraging and commuting potential they offer.

4.27 As such linear tree lines should be retained in-tact where possible to allow the passing of bats along such features. These measures listed in *High ays Agency nterim Advice ote ature*

Conservation Advice in elation to ats are commonly used and are considered suitable for the bat species recorded within the site and broadly comprise as follows: Where breaches have to be made, to minimise potential impacts to foraging routes, when hedgerows are to be breached, retained hedgerows will be re-enforced with native species planting. Where a proposed breach of the hedgerow exceeds 7m in length, where possible the planting will also include the implementation of standard trees adjacent to the road/footpath which will grow above the level of vehicle movement. The lower branches of such trees should be regularly pruned back to the trunk in order to ensure that the most suitable flight line is above the maximum traffic height (where applicable, low level lighting columns may also be used in this instance to reduce the likelihood of bats using the lower tree regions). The implementation of such hop-overs will allow continued echolocation across the break thereby allowing continued usage of the hedgerow as a foraging/commuting area. It will also reduce the chances of road traffic collisions for bats as well as birds.

4.28 Whilst the hop overs will take a little while to establish, the tree standards to be used shall be of an appropriate size and will be planted early in the development cycle. Whilst the breach will be present during the construction period until the hop over is established due to the small size of the proposed breaches the impacts upon the bats potentially commuting along them is considered to be minor.

Lighting

4.29 In addition, where lighting impacts cannot be off-set by planting, lighting of the site should be implemented under good practice and in accordance with existing guidelines to minimise the impacts arising from light disturbance. (BCT, 2011) Recommended measures to avoid the unnecessary lighting of newly created or retained habitats including the following

- Avoiding unnecessary lighting / turning off when not required
- The use of low level and / or hooded lamps to minimise light spill
- Application of low-intensity (sodium lamps or similar) lighting where possible
- Strategic planting or landscaping to shield sensitive areas

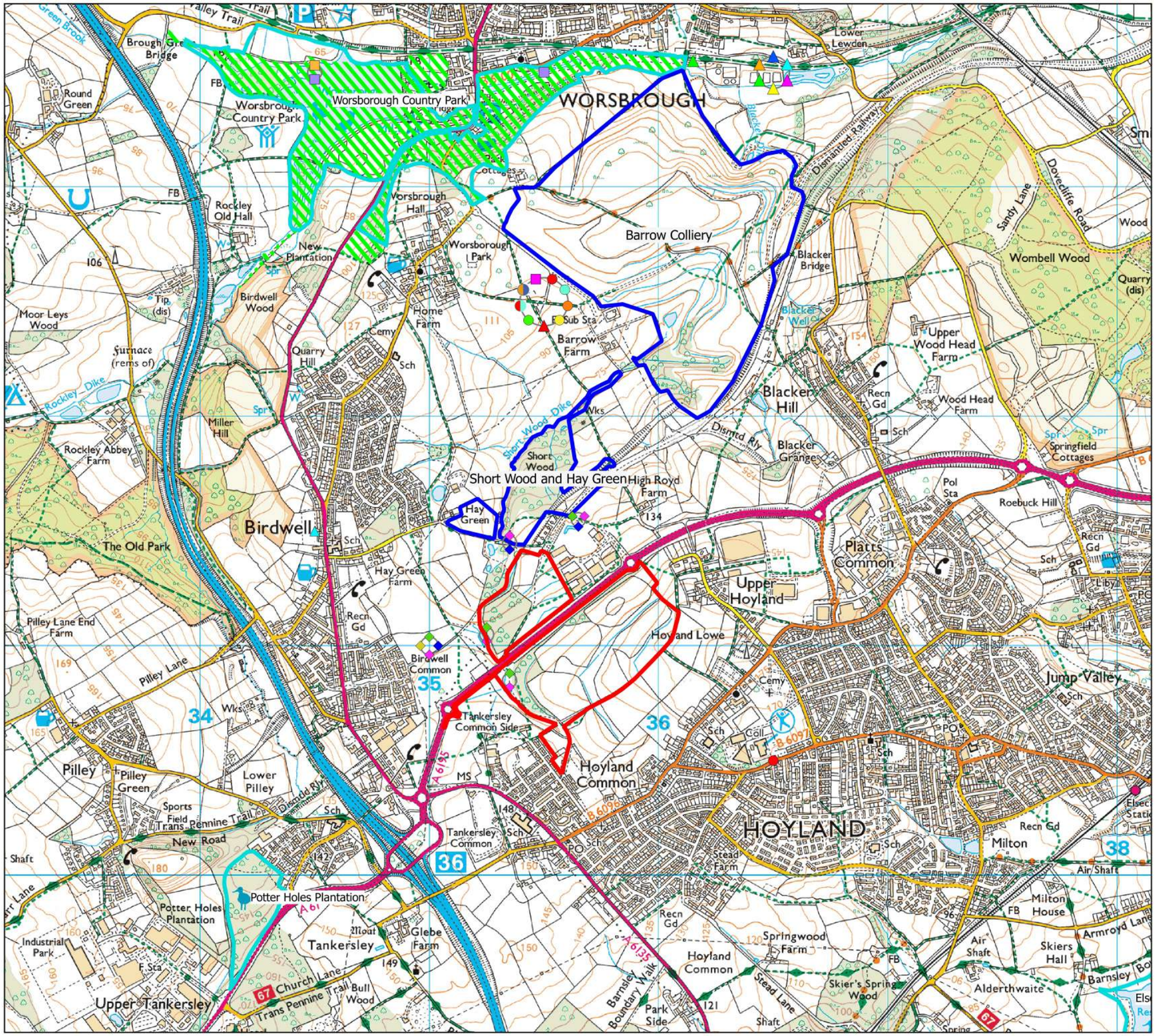
4.30 Additional enhancement in the form of bat boxes on suitable semi-mature/ mature trees around the site, especially in association with linear features or woodland and edge habitats would also create additional opportunities for roosting bats.

Summary

4.31 The strategic implementation of these measures is considered sufficient to ensure that there will be no significant adverse impacts upon the potential foraging and commuting habitats used by the local bat population. In addition, due to the overall nature the planting proposals a net gain to bat suitable habitats on-site may be achieved.

4.32 In the unlikely event that any bats are encountered during works, a licenced bat worker should be contacted immediately for further advice.

4.33 Although the exact masterplan has yet to be finalized, it is expected that some areas of potential commuting / foraging routes will be lost / severed. This is to be compensated for by extensive areas of suitable native landscape planting.


Worsborough Country Park
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Barrow Colliery
Short Wood and Hay Green
Birdwell
Platts Common
Upper Hoyland
Hoyland Common
HOYLAND
Tankersley
Pilley
Potter Holes Plantation
Wombell Wood
Blacker Hill
Blacker Grange
Upper Wood Head Farm
Wood Head Farm
Roebuck Hill
Jump Valley
Milton
Skiers Hall
Alderthwaite
Skier's Spring Wood
Springwood Farm
Stead Farm
Stead Lane
Barnsley Boundary Walk
Park Side
Hoyland Lowe
Birdwell Common
Tankersley Common Side
Tankersley Common
Hay Green
Hay Green Farm
High Royd Farm
Short Wood
Barrow Farm
Home Farm
Worsborough Hall
Worsborough Park
New Plantation
Birdwell Wood
Rockley Old Hall
Rockley Abbey Farm
Moor Leys Wood
Furnace (rems of)
Miller Hill
Quarry Hill
The Old Park
Pilley Lane End Farm
Pilley Lane
Pilley Green
Lower Pilley
Sports Field
New Road
Trans Pennine Trail
Industrial Park
Glebe Farm
Bull Wood
Church Lane
Upper Tankersley
Lower Lewden
Dovecliffe Road
Sandy Lane
Dismantled Railway
Blacker Bridge
Springfield Cottages
Round Green
Brough Grn Bridge
Green Brook
Rockley Dike
Short Wood Dike
Blacker Well
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Tip (dis)
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Milton House
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Legend

- Buildings
- Broadleaved woodland - semi-natural
- Broadleaved woodland - plantation
- Standing water
- I Improved grassland
- SI Poor semi-improved grassland
- A Cultivated/disturbed land - arable
- Standing water
- Intact hedge - species-poor
- Fence
- Dry ditch
- Scrub - scattered
- Static Detectors

Harworth Estates
Rockingham Business Park, Barnsley

PHASE 1 HABITAT PLAN

Scale: 1:5,177 OGJ / JD 11/8/2016

Figure 2 **6424-E-02**

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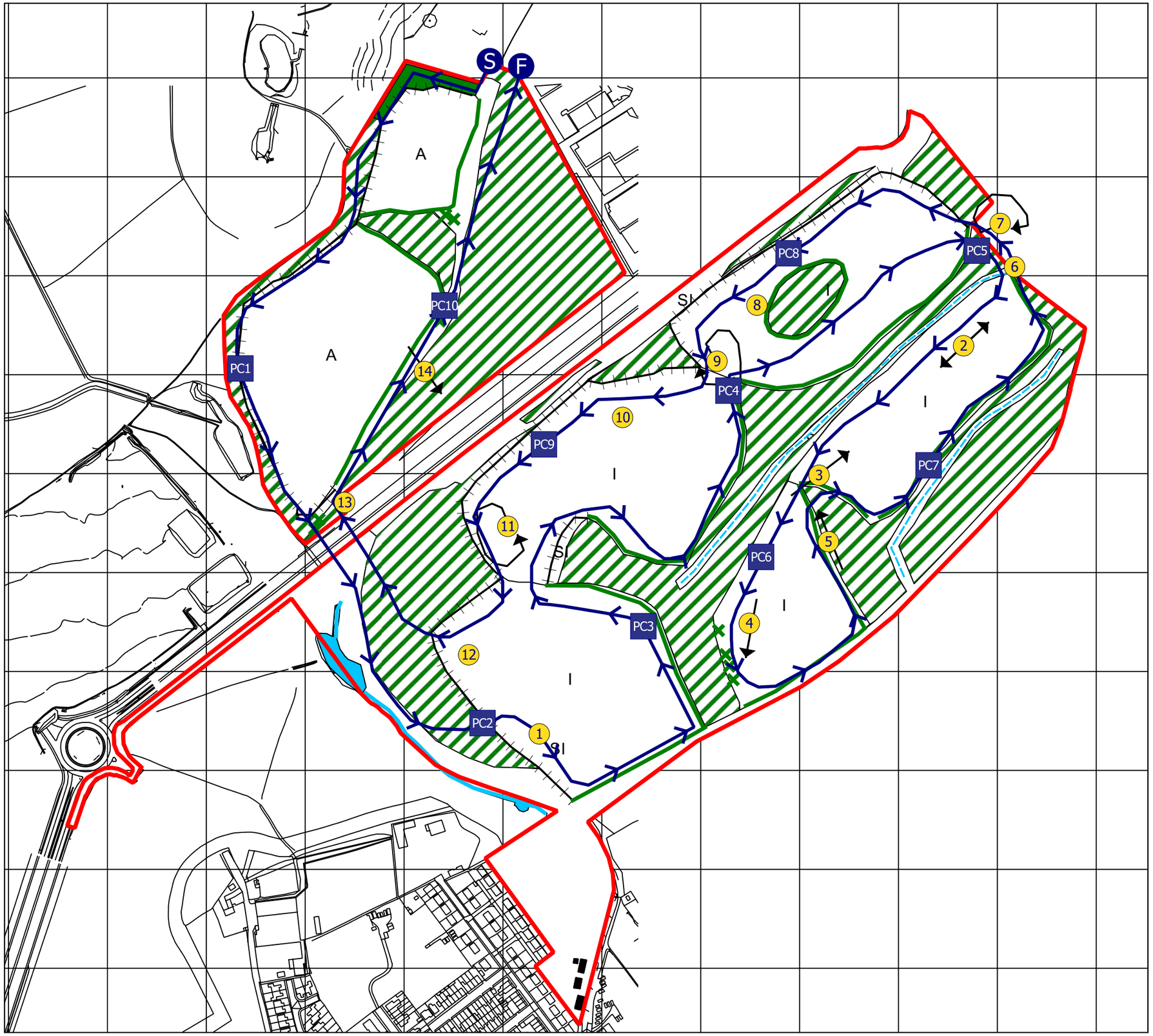

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Key

- Site Boundary
- Transect Route
- Transect Start/Finish location
- Location of Bat Contact (with reference)
- Point Count Location (with reference)
- Direction of Flight of Observed Bat

Harworth Estates Ltd.
Rockingham Business Park, Barnsley

BAT ACTIVITY RESULTS PLAN - MAY

Scale: 1:4,000 OGJ / JD 20/9/2016

Figure 3 **6424-E-04**

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Key

- Site Boundary
- Transect Route
- Transect Start/Finish location
- Location of Bat Contact (with reference)
- Point Count Location (with reference)

Harworth Estates Ltd.
Rockingham Business Park, Barnsley

BAT ACTIVITY RESULTS PLAN - JUNE

N

Scale: 1:4,000 OGJ / JD 20/9/2016

Figure 4 **6424-E-05**

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- Transect Start/Finish location
- Location of Bat Contact (with reference)
- Point Count Location (with reference)
- Direction of Flight of Observed Bat

Harworth Estates Ltd.
Rockingham Business Park, Barnsley

BAT ACTIVITY RESULTS PLAN - JULY

Scale: 1:4,000 OGJ / JD 20/9/2016

Figure 5 **6424-E-06**

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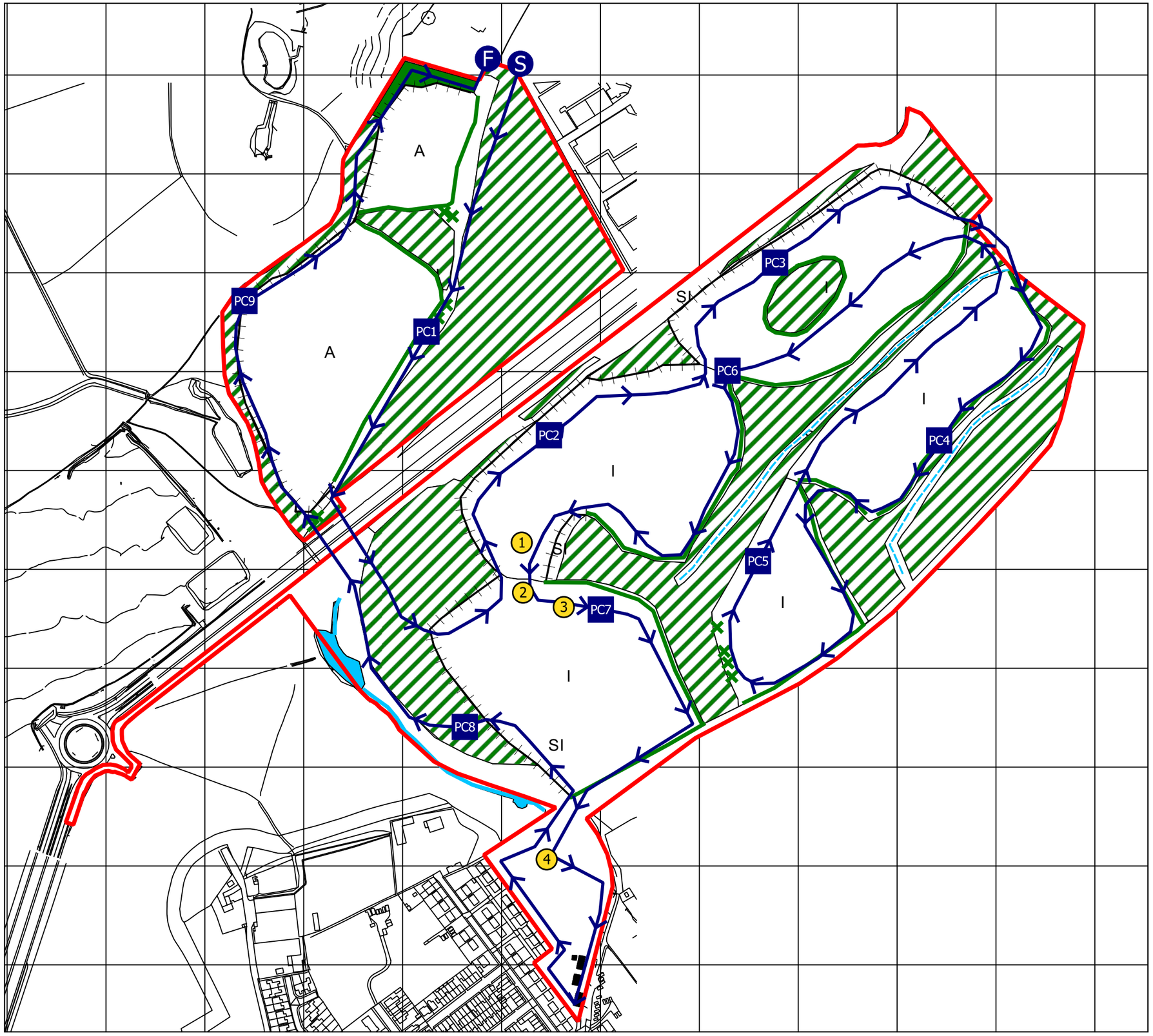

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Key

- Site Boundary
- Transect Route
- Transect Start/Finish location
- Location of Bat Contact (with reference)
- Point Count Location (with reference)

Harworth Estates Ltd.
Rockingham Business Park, Barnsley

BAT ACTIVITY RESULTS PLAN - AUGUST

N

Scale: 1:4,000 OGJ / JD 20/9/2016

Figure 6 **6424-E-07**

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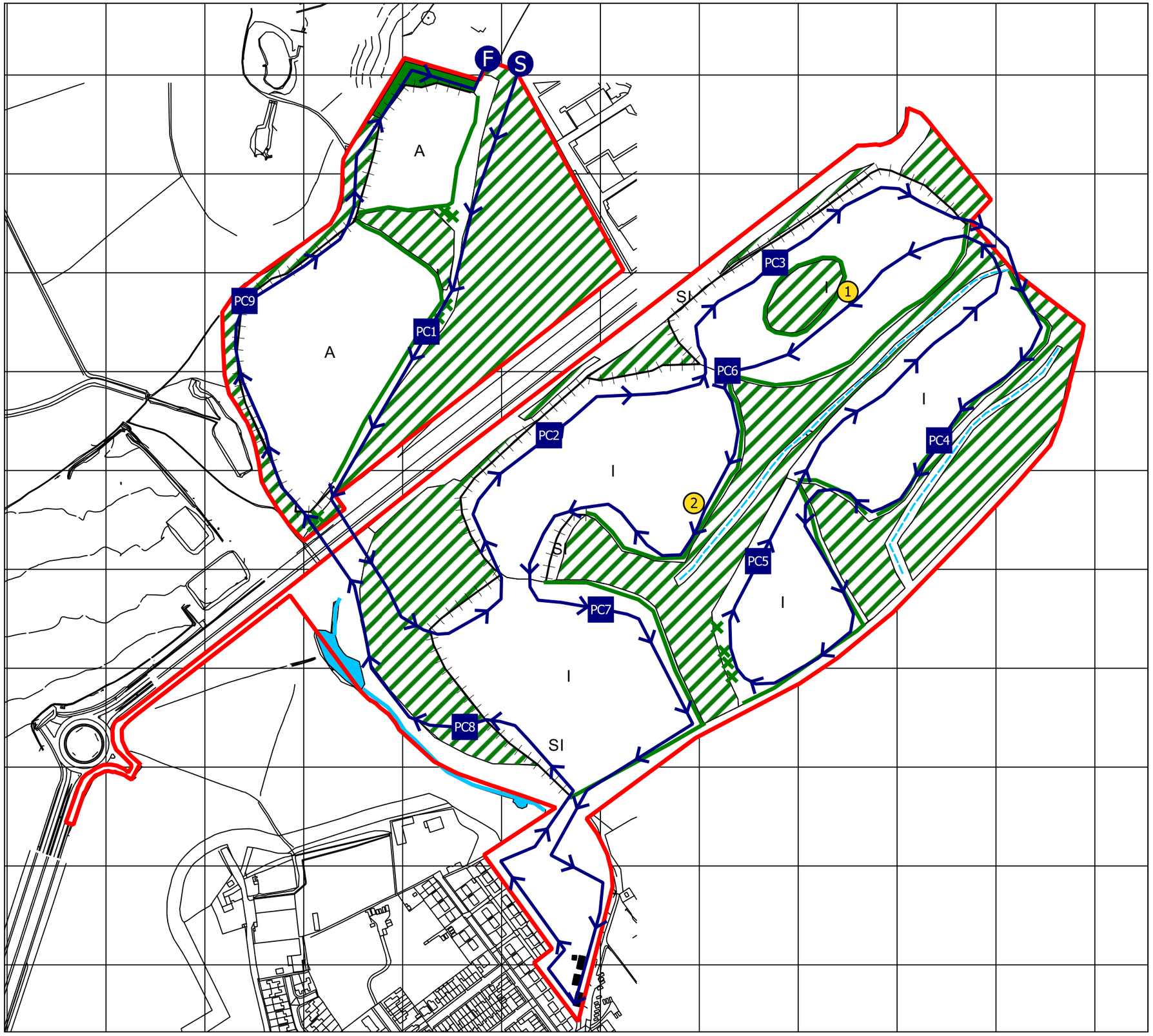

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Key

- Site Boundary
- Transect Route
- Transect Start/Finish location
- Location of Bat Contact (with reference)
- Point Count Location (with reference)

Harworth Estates Ltd.
Rockingham Business Park, Barnsley

BAT ACTIVITY RESULTS PLAN - SEPTEMBER (DUSK)

Scale: 1:4,000 OGJ / JD 20/9/2016

Figure 7 **6424-E-08**

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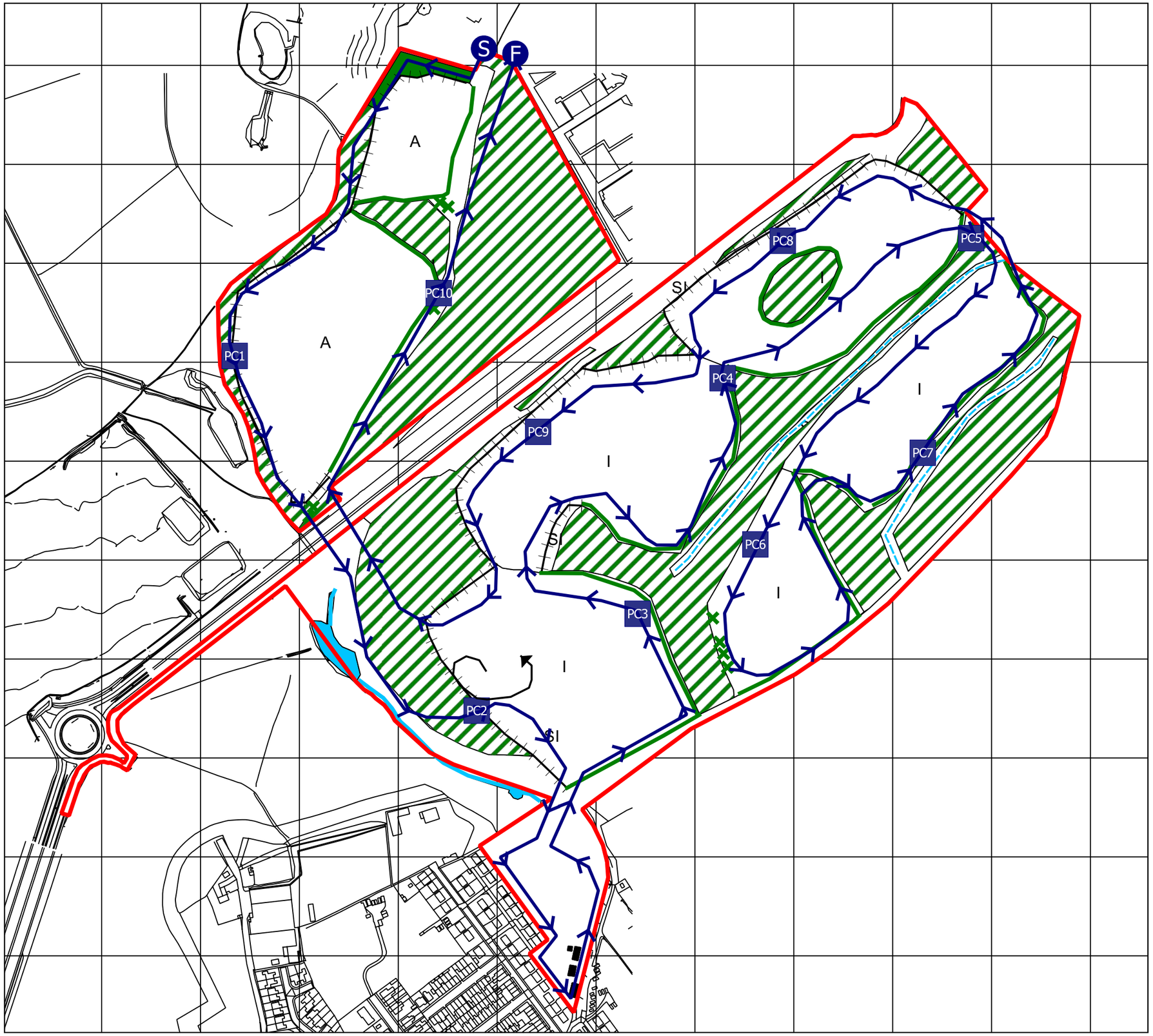

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Key

- Site Boundary
- Transect Route
- Transect Start/Finish location
- Location of Bat Contact (with reference)
- Point Count Location (with reference)

Harworth Estates Ltd.
Rockingham Business Park, Barnsley

BAT ACTIVITY RESULTS PLAN - SEPTEMBER (DAWN)

Scale: 1:4,000 OGJ / JD 20/9/2016

Figure 8 **6424-E-09**

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Appendix 1 – Summary Transect Survey Results

onth	Total contacts (point count umber in brac et)	Species recorded (in abundance order, most to least)	ctivity Summary
Survey 1: Dusk Transect 21st May	17(2)	2: Common pipistrelle and Nyctalus spp.	The area of peak activity comprised of improved grassland in the centre of the site with 4 foraging common pipistrelle contacts. Other contacts from this species were evenly scattered across the southern section of the site. Both Nyctalus contacts were in the southern area of the site.
Survey 2: Dusk Transect 18th June	3(1)	2: Common pipistrelle and Myotis spp.	The south area of the site had 2 bat contacts comprising a common pipistrelle foraging over improved grassland and a Myotis species foraging over plantation woodland. A common pipistrelle was recorded foraging along H11.
Survey 3: Dusk Transect 16th July	14(7)	2: Common pipistrelle and Nyctalus spp.	The area of peak activity occured in the south area of the site over improved grassland and plantation woodland with 4 contacts comprising of 3 contacts with foraging common pipistrelles and 1 foraging Nyctalus species. The rest of the contacts were scattered over the site.
Survey 4: Dusk Transect 4th August	4(2)	1: Common pipistrelle	All contacts were recorded over improved grassland bordering plantation woodland adjacent to H11 and H12.
Survey 5: Dusk Transect 21st September	4(2)	1: Common pipistrelle	The area of peak activity occured in the centre of the site along H9-H12 adjacent to plantation woodland.
Survey 6: Dawn Transect 22nd September	0	N/A	No activity recorded

Appendix 2 – Summary Static Survey Results

Survey period	ctivity range ith unit ref	Total registrations over (period)	Species recorded (in order of abundance and total number of registrations)
May	6(S2) to 700 registrations (S1), average of approximately 303 registrations. S1 located on H2 north of site in scattered scrub. S2 located centre of site in plantation woodland near dry ditch	1515(5 nights)	5: Common pipistrelle (1358), *yctalus* species (132), noctule (19), pipistelle species (3) and soprano pipistrelle (3)
June	9 to 116 registrations (S4), average of approximately 53 registrations S3 located north of site on H1 S4 located centre of site on H4	317(6 nights)	5: Common pipistrelle (295), *yctalus* spp. (18), noctule (2), soprano pipistrelle (1) and pipistrelle spp. (1)
July	1(S6) to 149 registrations (S5), average of approximately 80 registrations S5 located south of site bordering plantation woodland S6 located outside of site boundary to the north west	403(5 nights)	5: Common pipistrelle (362), *yctalus* spp (23), soprano pipistrelle (15), *yotis* spp (2) and pipistrelle spp. (1)
August	24 to 219 registrations (S8), average of approximately 162 registrations S7 located north of site in plantation woodland on site boundary S8 located in centre of site bordering plantation woodland	972(6 nights)	7: Common pipstrelle (920), *yctalus* spp. (29), soprano pipistrelle (12), *yotis* spp. (4), noctule (3), pipistrelle spp. (3) and Brown long-eared (1)

Survey period	ctivity range ith unit ref	Total registrations over (period)	Species recorded (in order of abundance and total number of registrations)
September	14(S9) to 117 registrations (10), average of approximately 150 registrations S9 located on site boundary to the north west of site S10 located on site boundary to the north east of site.	750(5 nights)	5: Common pipistrelle (588), *yctalus* spp. (116), soprano pipistrelle (36), *yotis* spp. (9) and pipistrelle spp. (1)

Appendix 3 – Detailed Transect Tables

Table 1 ay us

Contact ref no. or point count no.	Time	Species	Behaviour	abitat	escription (visual non-visual)
Pc1	21:15 to 21:20	No bats	n/a	n/a	n/a
Pc2	21:09 to 21:11	No bats	n/a	n/a	n/a
1	21:14	Nyctalus	Commuting	Improved Grassland	Non-visual
Pc3	21:20 to 21:22	No bats	n/a	n/a	n/a
Pc	21:31 to 21:33	No bats	n/a	n/a	n/a
Pc	21:39 to 21:41	No bats	n/a	n/a	n/a
2	a) 21:42	Nyctalus	Commuting	Improved Grassland/Plantation Woodland	Non-visual
	b)21:43	Common Pipistrelle	Foraging	Improved Grassland/Plantation Woodland	Constant foraging along plantation boundary
3	21L48	Common Pipistrelle	Foraging	Plantation Woodland	Flying eastwards along plantation boundary
Pc	21:51 to 21:53	No bats	n/a	n/a	n/a
	21:54	Common Pipistrelle	Commuting	Plantation Woodland	Flying south-westwards along planation boundary
	21:59	Common Pipistrelle	Commuting	Plantation Woodland	Non-visual
Pc7	22:03 to 22:05	No bats	n/a	n/a	n/a
	22:11	Common Pipistrelle	Foraging	Improved Grassland	Non-visual
7	22:12	Common Pipistrelle	Foraging	Improved Grassland	Circling eastwards offsite
Pc	22:18 to22:20	No bats	n/a	n/a	n/a
	22:21	Common Pipistrelle	Foraging	Improved Grassland	Non-visual
9	22:24	Common Pipistrelle	Foraging	Improved Grassland	Circling around the edge of improved grassland field
1	22:26	Common Pipistrelle	Foraging	Improved Grassland	Non-visual
11	22:13	Common Pipistrelle	Foraging	Improved Grassland	Circling around the centre of improved grassland field
Pc9	22:32 to 22:34	Common Pipistrelle	Foraging	Improved Grassland	Non-visual
12	22:40	Common Pipistrelle	Foraging	Improved Grassland	Non-visual

13	22:45	Common Pipistrelle	Foraging	Plantation Woodland	Non-visual
1	22:49	Common Pipistrelle	Foraging	Plantation Woodland	Flying south-eastwards
Pc1	22:51 to 22:53	Common Pipistrelle	Foraging	Plantation Woodland/Hedgerow	Non-visual

Table 2 une us

Contact ref no. or point count no.	Time	Species	Behaviour	abitat	escription (visual non-visual)
Pc1	21:20 to 21:25	No bats	n/a	n/a	n/a
Pc2	21:37 to 21:42	No bats	n/a	n/a	n/a
Pc3	21:48 to 21:53	No bats	n/a	n/a	n/a
Pc	22:02 to 22:07	No bats	n/a	n/a	n/a
Pc	22:18 to 22:23	No bats	n/a	n/a	n/a
Pc	22:36 to 33:41	No bats	n/a	n/a	n/a
1	22:43	Common Pipistrelle	Foraging	Improved Grassland/Plantation Woodland	Non-visual
Pc7	22:51 to 22:56	No bats	n/a	n/a	n/a
2	23:03	Common Pipistrelle	Foraging	Improved Grassland	Non-visual
Pc	23:10 to 23:15	Myotis	Foraging	Improved Grassland	Non-visual
Pc9	23:24 to 23:29	No bats	n/a	n/a	n/a

Table 3 uly us

Contact ref no. or point count no.	Time	Species	Behaviour	abitat	escription (visual non-visual)
Pc1	21:15 to 21:20	No bats	n/a	n/a	n/a
1	21:34	Nyctalus	Foraging	Plantation Woodland	Circling above plantation boundary
Pc2	21:37 to 21:42	No bats	n/a	n/a	n/a
Pc3	21:51 to 21:56	21:54: Common Pipistrelle	Commuting	Plantation Woodland	Non-visual
Pc	22:05 to 22:10	22:05: Common Pipistrelle	Commuting	Plantation Woodland	Non-visual
		22:09: Common Pipistrelle	Foraging	Plantation Woodland	Circling around plantation boundary
Pc	22:16 to 22:21	No bats	n/a	n/a	n/a
2	22:26	Common Pipistrelle	Foraging	Improved Grassland	Circling around edge of field
Pc	22:30 to 22:35	22:34: Common Pipistrelle	Foraging	Plantation Woodland	Circling along edge of plantation
3	22:42	Common Pipistrelle	Foraging	Plantation Woodland	Non-visual
Pc7	23:01 to 23:06	23:03: Common Pipistrelle	Foraging	Improved Grassland	Non-visual
		23:04: Common Pipistrelle	Foraging	Improved Grassland	Non-visual
	23:10	Common Pipistrelle	Foraging	Plantation Woodland	Non-visual
	23:13	Common Pipistrelle	Foraging	Plantation Woodland	Non-visual
Pc	23:14 to 23:19	23:15: Common Pipistrelle	Foraging	Hedgerow	Non-visual
	23:24	Common Pipistrelle	Foraging	Scrub	Non-visual
7	23:29	Common Pipistrelle	Foraging	Scrub	Non-visual

Table ugust us

Contact ref no. or point count no.	Time	Species	Behaviour	abitat	escription (visual non-visual)
Pc1	18:51 to 19:01	No bats	n/a	n/a	n/a
Pc2	19:15 to 19:20	No bats	n/a	n/a	n/a
Pc3	19:27 to 19:31	No bats	n/a	n/a	n/a
Pc	19:38 to 19:42	No bats	n/a	n/a	n/a
Pc	22:16 to 22:21	No bats	n/a	n/a	n/a
Pc	20:08 to 20:12	20:09: Common Pipistrelle	Foraging	Plantation Woodland	Non-visual
1	20:13	Common Pipistrelle	Foraging	Plantation Woodland/Improved Grassland	Non-visual
Pc7	20:18 to 20:23	20:20: Common Pipistrelle	Foraging	Plantation Woodland/Improved Grassland	Non-visual
2	20:28	Common Pipistrelle	Foraging	Plantation Woodland/Improved Grassland	Non-visual
Pc	20:32 to 20:27	No bats	n/a	n/a	n/a
Pc9	20:46 to 20:50	No bats	n/a	n/a	n/a
Pc1	20:58 to 21:02	No bats	n/a	n/a	n/a

Table September us

Contact ref no. or point count no.	Time	Species	Behaviour	abitat	escription (visual non-visual)
Pc1	18:57 to 19:01	No bats	n/a	n/a	n/a
Pc2	19:15 to 19:29	No bats	n/a	n/a	n/a
Pc3	19:27 to 19:31	No bats	n/a	n/a	n/a
Pc	19:38 to 19:42	No bats	n/a	n/a	n/a
Pc	19:52 to 19: 56	No bats	n/a	n/a	n/a
Pc	20:08 to 20:12	20:09: Common Pipistrelle	Foraging	Plantation Woodland	Non-visual
n a	20:13	Common Pipistrelle	Foraging	Improved Grassland	Non-visual
Pc7	20:18 to 20:22	20:20: Common pipistrelle	Foraging	Plantation Woodland	Non-visual
n a	20:28	Common Pipistrelle	Foraging	Plantation Woodland	Non-visual
Pc	20:32 to 20 36	No bats	n/a	n/a	n/a
Pc9	20:46 to 20:49	No bats	n/a	n/a	n/a
Pc1	20:58 to 21:02	No bats	n/a	n/a	n/a

Table September a n

Contact ref no. or point count no.	Time	Species	Behaviour	abitat	escription (visual non-visual)
Pc1	04:42 to 04:46	No bats	n/a	n/a	n/a
Pc2	04:52 to 04:56	No bats	n/a	n/a	n/a
Pc3	05:02 to 05:06	No bats	n/a	n/a	n/a
Pc	05:11 to 05:15	No bats	n/a	n/a	n/a
Pc	05:18 to 05:22	No bats	n/a	n/a	n/a
Pc	05:27 to 05:31	No bats	n/a	n/a	n/a
Pc7	05:35 to 05:39	No bats	n/a	n/a	n/a
Pc	05:44 to 05:49	No bats	n/a	n/a	n/a
Pc9	05:53 to 05:57	No bats	n/a	n/a	n/a
Pc1	06:02 to 06:04	No bats	n/a	n/a	n/a

Harworth Group

earne alley Par ay, oc ingham, Barnsley – Phases 2 and 3

ADDENDUM: 2018 BAT REPORT

December 2019

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ev	ssue Status	Prepared ate	pproved ate
-	Draft 1	JDH / 06.12.18	PH / 06.12.18

CONTENTS

1.0 INTRODUCTION 2

2.0 METHODOLOGY 2

3.0 RESULTS 4

4.0 DISCUSSION 7

TABLES

Table 1: Activity Transect Survey Conditions

FIGURES

Figure 1a: Bat Transect Survey Plan (21.06.18)

Figure 1b: Bat Transect Survey Plan (02.08.18)

Figure 1c: Bat Transect Survey Plan (26.09.18)

Figure 2: Static Detector Locations

APPENDICES

Appendix A: Static Detector Results

1.0 INTRODUCTION

1.1 This report details the results of a suite of bat surveys undertaken by FPCR Environment and Design Ltd. on behalf of Harworth Group on an area adjacent to Shortwood Business Park, Barnsley.

1.2 The surveyed area overlaps with the 2019 development area as detailed within the Ecological Appraisal (FPCR 2019).

Site Location and Context

The site is located adjacent to the west of Shortwood Business Park in Barnsley, to the north of the A6195 dual carriageway, Dearne Valley Parkway. The existing residential development of Birdwell is situated to the north-west and to the south the more extensive residential area of Hoyland. Junction 36 of the M1 Motorway lies less than 600m to the west. The surrounding land use is largely arable and pasture with an area of broad-leaved semi-natural woodland to the north, forming part of the Short Wood and Hay Green LWS. The site largely comprises establishing plantation woodland and semi-improved grassland fields, with associated native hedgerows.

2.0 METHODOLOGY

Field Surveys

eneral abitat Suitability

2.1 The site was also categorised for its habitat suitability for bats, which would also provide guidance on survey effort. The habitat suitable was assessed using guidance from the bat surveys, good practice guidelines (Bat Conservation Trust, 3rd Edition 2016[1]).

Bat ctivity Surveys (Transects)

2.2 The site was considered to provide low suitability for foraging and commuting bats and therefore seasonal transect surveys were undertaken.

2.3 The primary objective of transects was to identify foraging areas, commuting routes and species utilisation of the site. Guidance from the Bat Conservation Trust and Natural England[2] indicates that such surveys should be applied appropriately and in a proportionate manner, having regard to the area of habitat affected and the likely direct impact on bats.

2.4 The transect routes were determined prior to survey in order to sample most areas of the site with those areas considered to be of higher suitability for bat use being the main focus of the survey. The routes included point count stops to identify activity levels around the features of potential value to bats that are to be most affected by proposals (i.e. hedgerows, tree lines, dense scrub etc). Each point count was approximately five minutes long, during which time all bat activity was recorded.

2.5 Transects commenced at sunset and were each a minimum of two hours in duration. Each transect was walked at a steady pace and when a bat passed by, the species, time and behaviour was

1 Collins, J. (ed) (2016) Bat Survey for Professional Ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation Trust, London.

2 Mitchell-Jones AJ and McLeish AP (2004). *The Bat Workers' Manual, 3rd Edition*. JNCC, Peterborough

recorded on a site plan. This information provides a general view of the bat activity present on site and identifies the key foraging area/commuting routes.

2.6 Surveyors used Wildlife Acoustics Inc. Echo Meter Touch® bat detectors in conjunction with Echo Meter Touch® app and Apple Inc. iPad® during the transect surveys to detect bats and aid species identification.

2.7 Post-survey, bat calls were analysed using Wildlife Acoustics, Inc. Kaleidoscope© software package by taking measurements of the peak frequency, inter-pulse interval, call duration and end frequency. From this, the level of bat activity across the site in relation to the abundance of individual species foraging and commuting along habitats was assessed.

2.8 Three activity transects were undertaken between June 2018 and September 2018. All transects were undertaken when conditions were suitable, i.e. when the ambient air temperature exceeded 10°C and there was little wind and no rain. Full conditions and timings are listed in Table 1.

Table 1 ctivity Transect Survey Conditions

ate	Sunset Sunrise	Start and inish Time	Temperature at start and end of survey C	ain (-)	ind (-)	Cloud
21.06.18	21:39	21:39-23:48	17-12	0	0	10
02.08.18	21:00	21:00-23:00	24-20	0	0	15
26.09.18	18:55	18:55-20:55	19-16	0	0	5

Static Bat etector Surveys

2.9 Static passive recording broadband detectors were deployed on site to supplement the manual transects surveys. Due to the size of the site and the assessment of habitat suitability to support foraging and commuting bats, static units were deployed on site for a minimum of five consecutive nights.

2.10 Passive monitoring was undertaken using an automated logging system; either Wildlife Acoustics Inc. Song Meter® SM4BAT-FS bat detectors, with outputs saved to an internal storage device. Bat detectors were placed along linear features considered to be of value to bats, such as hedgerows, woodlands, watercourses and tree lines.

2.11 Devices were placed in each location for an extended period of time of suitable weather conditions (little no rain/wind and temperatures above 10°C). The conditions over each of the survey period were however representative for the timing of the survey. Detectors were programmed to activate 30 minutes before dusk and recorded continuously until 30 minutes following sunrise.

2.12 For the purposes of analysis if the static detector was out over five nights any additional nights were only assessed for Annex II bat species. The recorded data was analysed using Wildlife Acoustics, Inc. Kaleidoscope© software package to assess the amount of bat activity on site by recording the number of bat passes

Limitations

2.13 Although species identification is done to as accurate a level as possible, in some cases the quality of the call is such that full species identification cannot be made. Therefore, in some cases terminology may be general (for example pipistrelle species or *yotis* species).

2.14 The analysis of the SM4BAT FS files recorded can highlight the presence of more than one bat if they are recorded simultaneously on the same sound file. However, it is not possible to determine whether consecutive sound files have been recorded as the result of a single bat passing the detector as it commutes across the landscape or by one bat repeatedly triggering the detector as it forages in close proximately for an extended period. Therefore, each sound file is counted as a single bat registration. The number of bat registrations does however reflect the relative importance of the location of the detector by calculating the bat registrations per hour. The static detectors record in full spectrum and the full spectrum data is analysed using Kaleidoscope Viewer (v.5.0.3).

3.0 RESULTS

Field Surveys

eneral abitat Suitability

3.1 The site included several grassland fields providing foraging habitat with associated hedgerows, and woodlands providing further foraging and commuting routes to the wider area.

Bat ctivity Surveys (Transects)

3.2 The following sections are a summary of the results recorded during the nocturnal transect surveys. A full breakdown of the data, including detailed tables and locations are available in the associated plans (as indicated). Species on site comprised common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus* and unidentified pipistrelle species, noctule *yctalus noctule*, unidentified *yctalus* species, and unidentified *yotis* species.

Transect 1: 21st June 2018 (Figure 1a)

3.3 A total of eight registrations were recorded during this survey comprising entirely of common pipistrelle. The first registration occurred at 22:26 (47 minutes after sunset) which consisted of one common pipistrelle foraging along the access road on the western site boundary.

3.4 Activity was mainly associated with woodland features in the centre of the site and the western boundary. A single registration being recorded in the most north-eastern arable area. The majority of bat behaviour recorded was foraging.

Transect 2: 2nd August 2018 (Figure 1b)

3.5 A total of seventeen registrations were recorded during this survey, comprising ten common pipistrelle, two soprano pipistrelle and four noctule. The first bat registration was at 21:30 (nine minutes before sunset), which occurred in central woodland corridor and was a common pipistrelle.

3.6 Activity was widespread throughout the site, mostly associated with scattered trees and hedgerows. Bat behaviour recorded was a mix of foraging and commuting.

Transect 3: 26th September 2018 (Figure 1c)

3.7 A total of fourteen bat registrations were recorded during this survey comprising seven common pipistrelle, three soprano pipistrelle, one noctule, two *yctalus sp* and one *yotis sp* The first registration was a *yctalus sp*. At 19:17 (22 minutes after sunset) which was seen above the north-western field compartment.

3.8 Activity was recorded throughout the north of the site, along woodland edges, hedgerows and above grassland areas. The *yotis sp*. registration was restricted to the central woodland corridor where it was recorded commuting. Common pipistrelle and soprano pipistrelle were recorded displaying a range of behaviours; commuting and foraging. *yctalus sp*. and noctules were recorded both commuting and foraging.

Static Bat etector Surveys

3.9 The following details the results of static monitoring of bat activity in 2018 with full results in Appendix A and Figure 2 showing locations of units.

3.10 Species on site comprised common, soprano and unidentified pipistrelle species, noctule and unidentified *yctalus* species, brown long-eared and unidentified *yotis* species.

Spring 2018

3.11 The total amount of survey hours for static detector S1 was 40 hours with the detector deployed on the evening of 21st June 2018 until the morning of 26th June 2018.

3.12 A total of 824 bat registrations were recorded by S1 comprising common, soprano and unidentified pipistrelle species, noctule, and unidentified *yotis* species.

3.13 Common pipistrelle made up 85% of all registrations. They had an activity peak from 22:00-23:00 totalling 371 registrations over five nights, and their nightly total varied between 20 and 221 registrations.

Summer 2018

3.14 The total survey hours for static detector S2 was 48 hours with the detector deployed on the evening of 2nd August 2018 until the morning of 7th August 2018.

3.15 A total of 747 bat registrations were recorded by S2 comprising common, soprano and unidentified pipistrelle species, noctule and unidentified *yctalus* species, brown long-eared and unidentified *yotis* species.

3.16 Common pipistrelle made up 79% of all registrations. They had an activity peak from 22:00-23:00 totalling 151 registrations over five nights, and their nightly total varied between 39 and 161 registrations.

Autumn 2018

3.17 The total survey hours for static detector S3 was 67 hours with the detector deployed on the evening of 28th September 2018 until the morning of 3rd October 2018.

3.18 A total of 2190 bat registrations were recorded by S3 comprising common, soprano and unidentified pipistrelle species, noctule, brown long-eared and unidentified *yotis* species.

3.19 Common pipistrelle made up 94% of all registrations. They had an activity peak from 19:00-20:00 totalling 530 registrations over five nights, and their nightly total varied between 79 and 988 registrations.

4.0 DISCUSSION

General Habitat Assessment

4.1 Overall the site was considered to be of low value for bats with the hedgerows and woodland edges providing the most valuable onsite habitat providing opportunities for foraging and commuting. The grassland provided some limited foraging habitat due to the open nature of the fields which also provided habitat for larger species of bat (e.g. *yctalus* species).

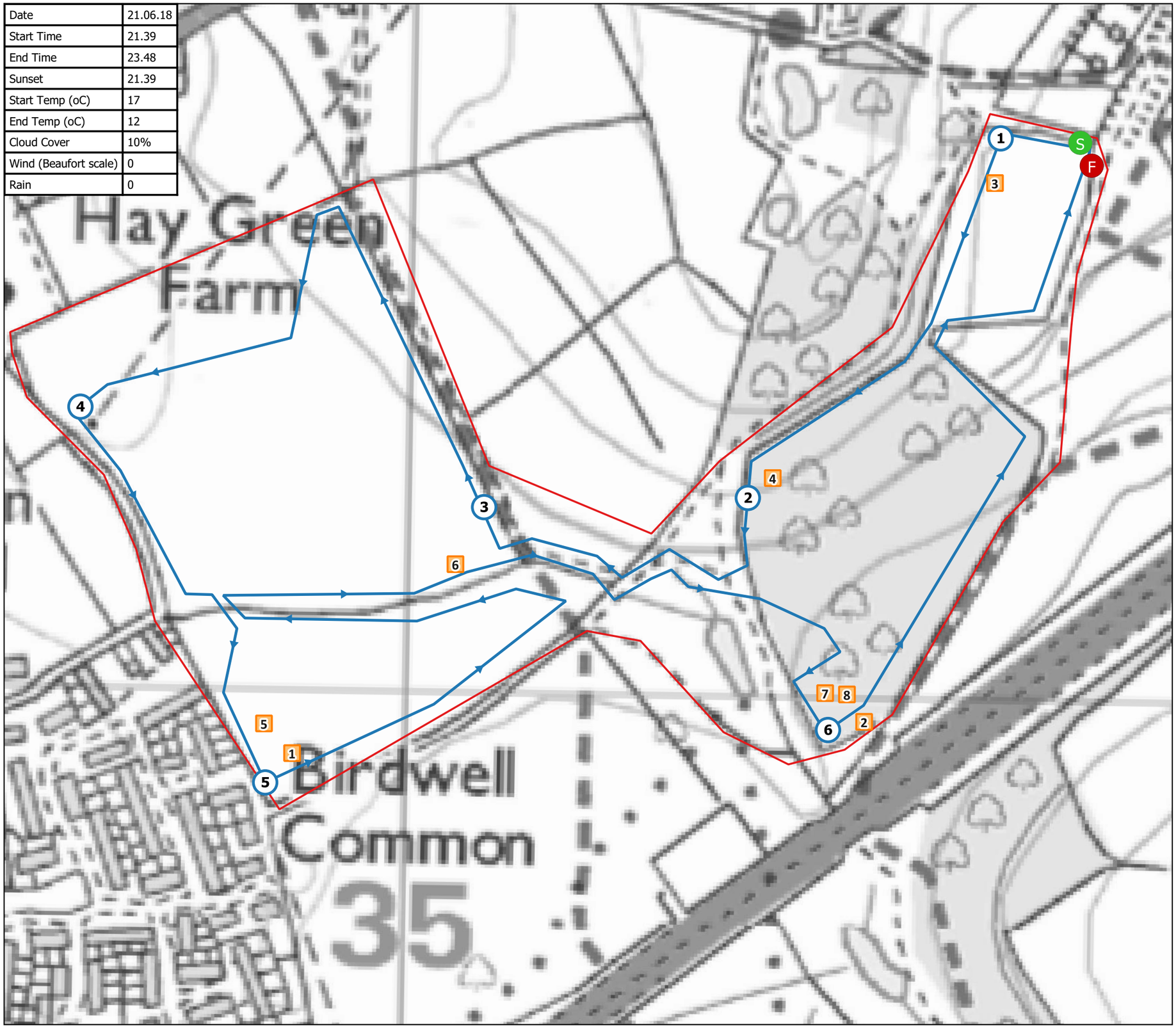
4.2 Based on the habitat assessment, seasonal transects were undertaken between April and September. Bat activity levels averaged at 13 bat registrations per visit (a maximum of 17 during the August 2018 transect and a low of eight in the June 2018 survey). In addition, the species assemblage was limited to five species, two of which could only be identified to genus level, comprising (in order of abundance); common pipistrelle, noctule, soprano pipistrelle, *yctalus* sp., and *yotis* sp.

4.3 Activity for most species focused along boundary features and the central woodland. *yotis sp* were only recorded within the central woodland.

4.4 A total of seven species/species groups recorded by the static detectors (common pipistrelle, soprano pipistrelle, pipistrelle sp., noctule, *yctalus* sp., *yotis* sp., and brown long-eared). Common pipistrelle were by far the most frequently recorded species, accounting for just over 89% of all records. Soprano pipistrelle were the next most abundant, accounting for just over 7% of all records.

4.5 At least five of the recorded species were registered at all statics. The highest activity levels were recorded on S3 with 2190 registrations in Autumn 2018 dominated by common pipistrelle. The activity level varied by more than a factor of ten from night to night which suggests variation may be linked to foraging conditions. Static S3 was located in the north east of the site, in proximity to Short Wood and Hay Green LWS which is a large area of mature woodland from which bats could easily commute.

Date	21.06.18
Start Time	21.39
End Time	23.48
Sunset	21.39
Start Temp (oC)	17
End Temp (oC)	12
Cloud Cover	10%
Wind (Beaufort scale)	0
Rain	0



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Key:

- Site Boundary
- Start point
- Finish point
- Point Count (with ref.)
- Transect Route
- Flight Path

Bat Contacts

- Common Pipistrelle

Reference No.	Time	Species	Behaviour	Passes	Comments
PC1	21.41-21.46				
PC2	21.52-21.57				
PC3	22.00-22.05				
PC4	22.13-22.18				
PC5	22.22-22.27				
1	22.26-22.27	C.Pip	Foraging	4	
PC6	22.39-22.44				
2	22.40-22.42	C.Pip	Foraging	6	2 Bats
PC1	22.50-22.55				
3	22.51-22.55	C.Pip	Foraging	Cont.	5 Bats
PC2	22.58-23.03				
4	23.01	C.Pip	Commuting	1	Flying high
PC3	23.06-23.11				
PC4	23.16-23.21				
PC5	23.24-23.29				
5	23.27	C.Pip	Unknown	1	Non Visual
6	23.38	C.Pip	Foraging	3	
PC6	23.39-23.44				
7	23.4	C.Pip	Foraging	1	Non Visual
8	23.42	C.Pip	Foraging	1	Non Visual

client
Harworth Group

project
Dearne Valley Business Park, Rockingham, Barnsley

drawing title
BAT TRANSECT PLAN (21.06.18)

scale @ A3 1:2750 | drawn ERW/JD | issue 6/12/2019

drawing / figure number **Figure 1a** | rev **6426-E-01**

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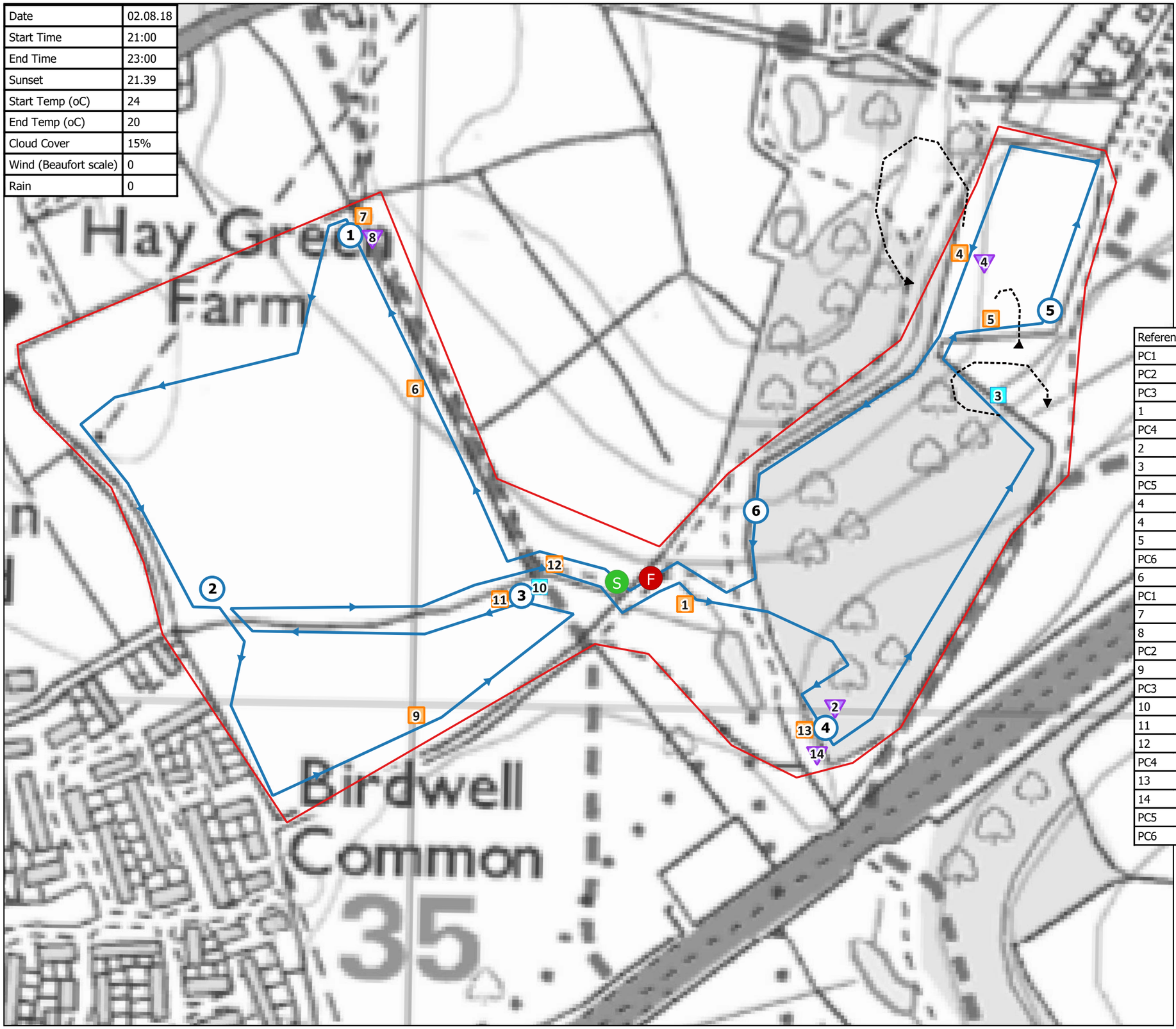
0 25 50 75 100 m

J:\6400\6424\QGIS 2.14 NEW\Plans\Bat Figures\6426-E-03 Transect Plan 1 (21.06.18).qgs

Date	02.08.18
Start Time	21:00
End Time	23:00
Sunset	21.39
Start Temp (oC)	24
End Temp (oC)	20
Cloud Cover	15%
Wind (Beaufort scale)	0
Rain	0



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Key:

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- Start point
- Finish point
- Point Count (with ref.)
- Transect Route
- Flight Path

Bat Contacts

- Common Pipistrelle
- Common / Soprano Pipistrelle
- Noctule

Reference No.	Time	Species	Behaviour	Passes	Comments
PC1	21.05-21:08				
PC2	21:15-21:18				
PC3	21:26-21:29				
1	21:30	C. Pipistrelle	U	1	Non Visual
PC4	21:34-21:37				
2	21:35	Noctule	U	1	Non Visual
3	21:40	C. Pipistrelle/S. Pipistrelle			
PC5	21:46-21:49				
4	21:50	C. Pipistrelle	F	3	Along tree line
4	21:53	Noctule	U	1	Non Visual
5	21:54	C. Pipistrelle	F	2	Non Visual
PC6	21:57-22:00				
6	22:04	C. Pipistrelle	F	4	Non Visual
PC1	22:07-22:10				
7	22:07	C. Pipistrelle	F	2	Non Visual
8	22:08	Noctule	F	1	Non Visual
PC2	22:16-22:19				
9	22:23	C. Pipistrelle	F	3	Non Visual
PC3	22:30-22:33				
10	22:30	C. Pipistrelle/S. Pipistrelle	F	2	Non Visual
11	22:33	C. Pipistrelle	F	Cont.	Non Visual
12	22:36	C. Pipistrelle	F	1	Non Visual
PC4	22:39-22:42				
13	22:39	C. Pipistrelle	F	3	Non Visual
14	22:40	Noctule	F	1	Non Visual
PC5	22:48-22:51				
PC6	22:56-22:59				

client
Harworth Group

project
Dearne Valley Parkway, Rockingham, Barnsley

drawing title
BAT TRANSECT PLAN (02.08.18)

scale @ A3
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drawn
ERW/JD

issue
6/12/2019

drawing / figure number
Figure 1b

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6426-E-01

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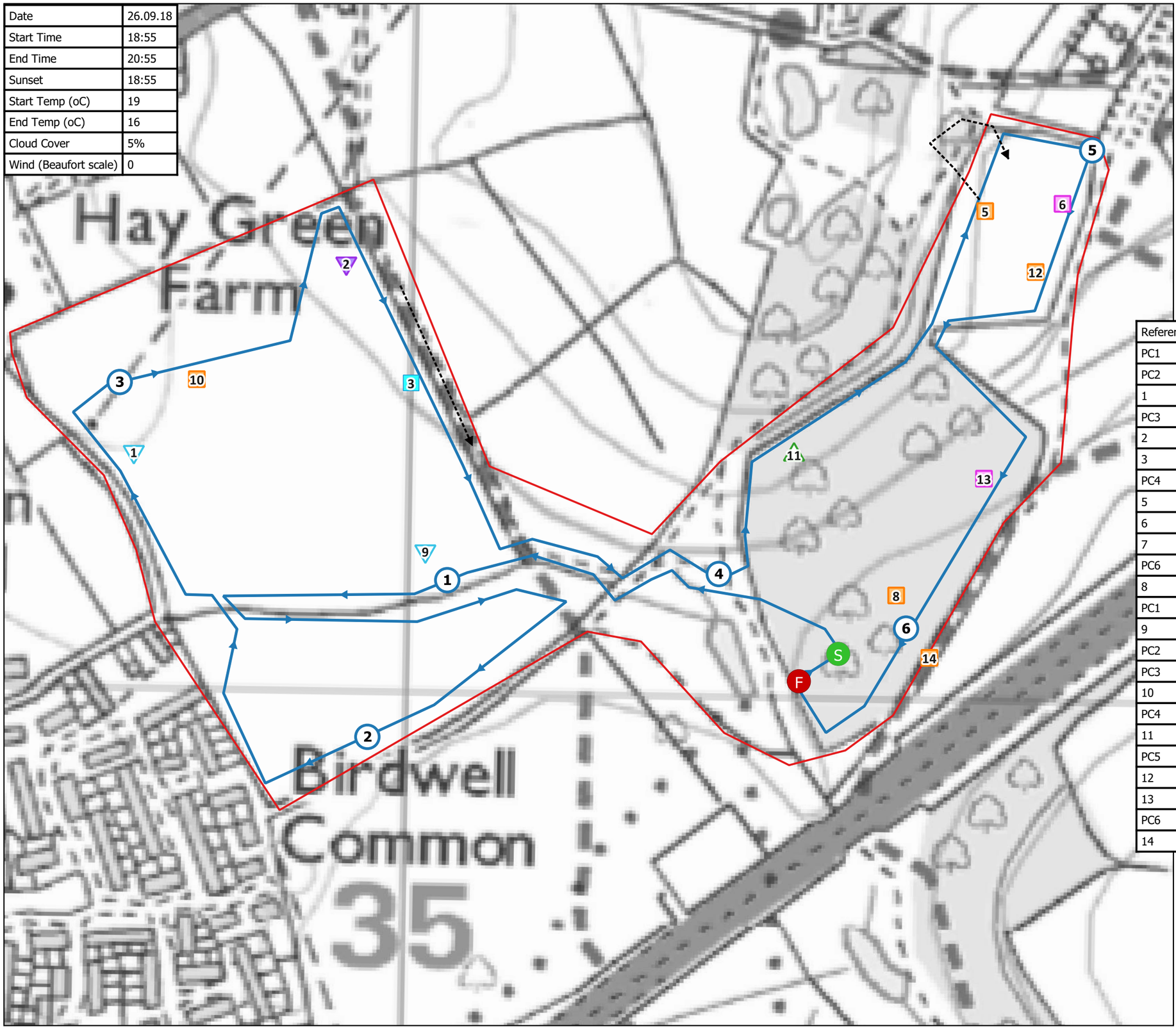
masterplanning ■ environmental assessment ■ landscape design ■ urban design ■ ecology ■ architecture ■ arboriculture

0 25 50 75 100 m

J:\6400\6424\QGIS 2.14 NEW\Plans\Bat Figures\6426-E-03 Transect Plan 1 (21.06.18).qgs

Date	26.09.18
Start Time	18:55
End Time	20:55
Sunset	18:55
Start Temp (oC)	19
End Temp (oC)	16
Cloud Cover	5%
Wind (Beaufort scale)	0



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Key:

- Site Boundary
- Start point
- Finish point
- Point Count (with re
- Transect Route
- Flight Path

Bat Contacts

- Common Pipistrelle
- Common / Soprano Pipistrelle
- Soprano Pipistrelle
- Myotis Species
- Nyctalus Species
- Noctule

Reference No.	Time	Species	Behaviour	Passes	Comments
PC1	19:00-19:03				
PC2	19:02-19:05				
1	19:17	Nyctalus sp.	C	1	Non Visual
PC3	19:20				
2	19:25	Noctule	F	Cont.	Non Visual
3	19:28	C. Pipistrelle/S. Pipistrelle	F	2	Non Visual
PC4	19:33-19:36				
5	19:47	C. Pipistrelle	F	3	Non Visual
6	19:49	S. Pipistrelle	F	1	
7	19:51	C. Pipistrelle	F	4	
PC6	19:53-19:56				
8	19:56	C. Pipistrelle	F	Cont.	Non Visual
PC1	20:01-20:04				
9	20:01	Nyctalus sp.	C	1	Non Visual
PC2	20:09-20:12				
PC3	20:15-20:18				
10	20:21	C. Pipistrelle	F	4	Non Visual
PC4	20:26-20:29				
11	20:30	Myotis sp.	C	2	Non Visual
PC5	20:34-20:37				
12	20:38	C. Pipistrelle	F	Cont.	Non Visual
13	20:41	S. Pipistrelle	F	2	Non Visual
PC6	20:44-20:47				
14	20:45	C. Pipistrelle	F	1	Non Visual

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Harworth Group

project
Dearne Valley Business Park, Rockingham, Barnsley

drawing title
BAT TRANSECT PLAN (26.09.18)

scale @ A3
1:2750

drawn
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issue
6/12/2019

drawing / figure number
Figure 1c

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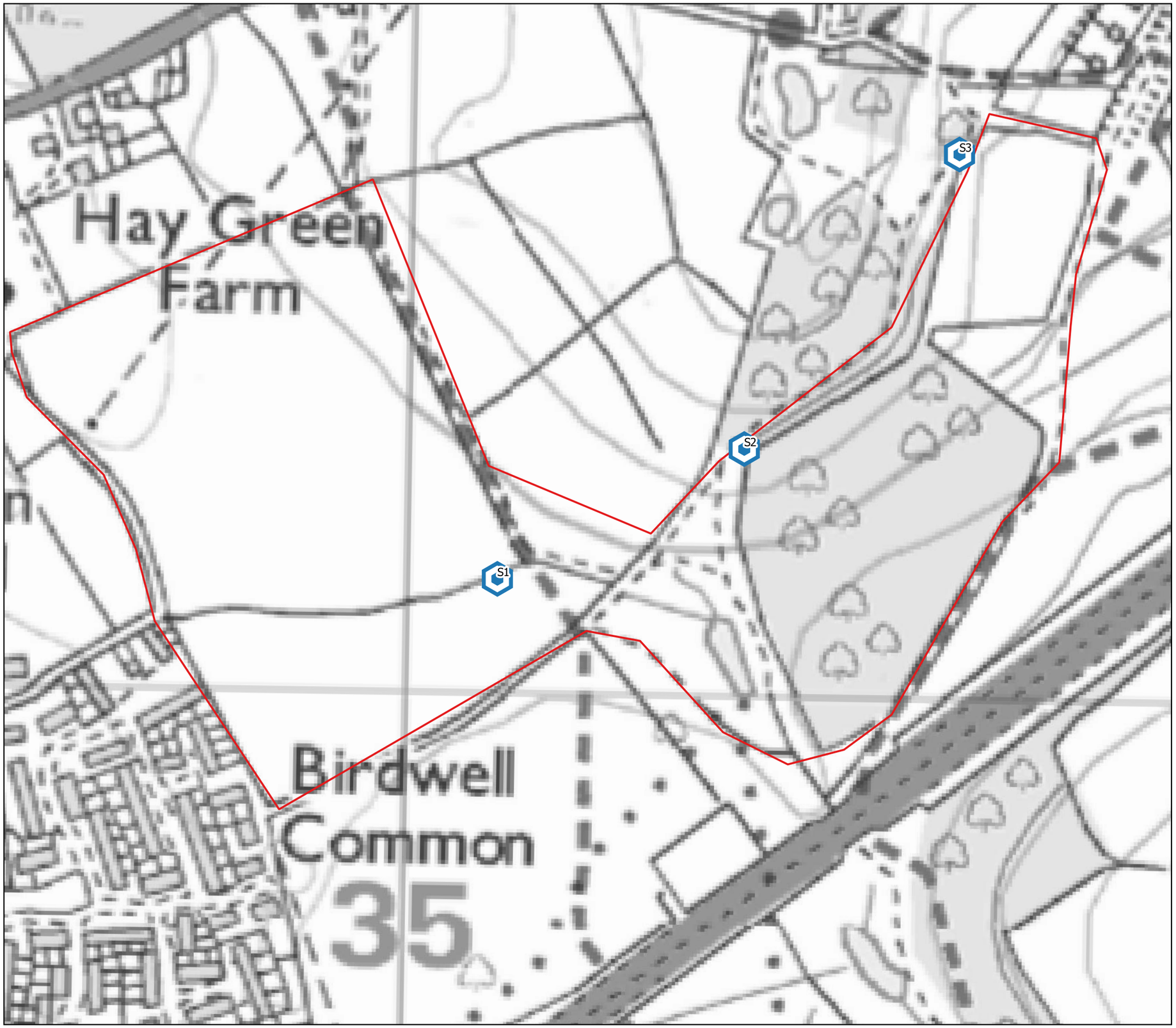

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Key:

Site Boundary

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drawing / figure number	rev
Figure 2	**6426-E-02**

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APPENDIX A: STATIC DETECTOR RESULTS

ording Pe	Unit No.	Start Date	End Date	urvey Hou	l Av. per h	l Registrat	Common Pipistrelle			Soprano Pipistrelle			Noctule			Pipistrelle Species			Myotis Species			Brown Long-eared			Nyctalus Species		
							Period Total	Peak Count	Av. Per Hour	Period Total	Peak Count	Av. Per Hour	Period Total	Peak Count	Av. Per Hour	Period Total	Peak Count	Av. Per Hour	Period Total	Peak Count	Av. Per Hour	Period Total	Peak Count	Av. Per Hour	Period Total	Peak Count	Av. Per Hour
Spring	1	21/06/2018	26/06/2018	39:53:30	20.656	824	699	221	17.522	91	44	2.281	20	7	0.501	13	8	0.326	1	1	0.025	0	0	0	0	0	0
Summer	2	02/08/2018	07/08/2018	47:54:25	15.593	747	591	161	12.336	99	25	2.067	26	10	0.543	15	6	0.313	9	4	0.188	6	4	0.125	1	1	0.021
Autumn	3	28/09/2018	03/10/2018	67:10:54	32.598	2190	2066	988	30.752	80	36	1.191	2	2	0.03	13	6	0.194	27	16	0.402	2	1	0.03	0	0	0
			Totals:	154:58:50	24.268	3761	3356	988	21.654	270	44	1.742	48	10	0.31	41	8	0.265	37	16	0.239	8	4	0.052	1	1	0.006

Harworth Estates

oc ingham Business Par , Barnsley

Appendix 7.4 - Breeding Bird Survey Report

September 2016

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ev	ssue Status	Prepared ate	Chec ed ate	pproved ate
-	Draft 1	TPE / 22.08.16	TJM / 20.09.16	JD / 20.09.16

CONTENTS

1.0 EXECUTIVE SUMMARY 3

2.0 LEGISLATION & STATUS 5

3.0 METHODOLOGY 6

4.0 RESULTS AND EVALUATION 8

TABLES

1 Survey Dates and Conditions

2 Evaluation Criteria

3 Notable Bird Species Recorded Within the Site as provided by Sheffield City Ecology Unit

4 Evaluation of Species Considered Potentially Sensitive to Site Proposals

5 Protected, species of Principal Importance, BoCC Red and Amber Listed Bird Species Recorded on site during Breeding Bird Surveys 2015 and their Recent Status within Yorkshire.

FIGURES

1 Breeding Bird Survey 2015 – Distribution of Notable Species

APPENDICES

A EOAC Criteria for Categorisation of Breeding Status

B Breeding Bird Survey Results 2015

1.0 EXECUTIVE SUMMARY

1.1 This assessment has been undertaken to identify any potential ecological issues associated with the proposed industrial development of land off A6195 near Birdwell, Barnsley, South Yorkshire. To meet the requirement of the brief, a suite of breeding bird surveys were undertaken and recommendations for mitigation, compensation and further survey were made where appropriate.

1.2 No statutory designated sites of international or national nature conservation importance were identified within 5 km or 2 km of the site boundary, respectively. Two local wildlife sites were present within 2km of the site, Short Wood & Hay Green approximately 50m north of the site and Barrow Colliery located around 700m from site. Neither LWS was designated for its assemblage of breeding birds.

1.3 Habitats on site considered to be of greatest value to breeding birds included the areas of immature scrub / woodland, hedgerows and waterbodies which offered nesting opportunities for a range of species. Grassland areas were also considered to provide some potential to ground nesting species however the intensively grazed nature of the majority of the field compartments was considered to significantly reduce this potential.

1.4 A moderate assemblage of birds was recorded on-site however these were considered to be typical on both local and wider scales but a low number of red listed species including house sparrow, starling and skylark were recorded.

1.5 All hedgerows, woodland and scrub should be retained where possible however where vegetation clearance must take place, this should occur outside of the bird breeding season (March to August inclusive) to minimise the risk of disturbance to breeding birds. If this is not possible, such vegetation should be checked prior to removal by a suitably experienced ecologist. If active nests are found, vegetation should be left untouched and suitably buffered from works until all birds have fledged. Specific advice should be sought prior to undertaking the clearance.

INTRODUCTION

1.6 This report has been prepared by FPCR Environment and Design Ltd on behalf of Harworth Estates. The report provides the results of a series of breeding bird surveys undertaken on a site to the north and south of the Dearne Valley Parkway (A6195).

Site Location and Context

1.7 The subject site is located adjacent to the west of Shortwood Business Park and comprises a parcel of land to the north and south across the A6195 duel carriageway. To the north / northwest lies arable farmland beyond which the existing residential development of Birdwell, to the northeast, Short Wood, to the east lies the existing development of Short Wood Business Park, to the south the more extensive residential area of Hoyland and to the east of this is an industrial development currently under construction. Junction 36 of the M1 Motorway lies around 800m to the west. The surrounding land use comprised largely arable and pasture with an area of broadleaved semi-natural woodland to the north.

1.8 The subject site consists of a former quarry restored to arable and improved pasture with associated native hedgerows and mixed plantation woodland. Two attenuation bodies, drainage channel (partially culverted) and associated semi-improved grassland are in the southwest and further limited parcels of semi-improved grassland are associated with plantation margins.

Objectives of Study

1.9 The objectives of the survey were to:

- Identify the presence and distribution of breeding birds on the site;
- Evaluate the importance of local bird populations and their habitat requirements;
- Evaluate the conservation importance of the site;
- To identify areas of ornithological interest and make recommendations to minimise the potential impact of the scheme.

Development Proposals

1.10 Proposals are for a business park development comprising warehousing with associated parking, lorry compounds and infrastructure.

2.0 LEGISLATION & STATUS

Legislation

2.1 The Wildlife and Countryside Act 1981 (as amended) is the principal legislation affording protection to UK wild birds. Under this legislation all birds, their nests and eggs are protected by law and it is an offence, with certain exceptions to recklessly or intentionally:

- Kill, injure or take any wild bird;
- Take, damage or destroy the nest of any wild bird while in use or being built;
- Take or destroy the egg of any wild bird.

2.2 Species listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) are specially protected at all times. This protection extends whereby they are protected against intentional disturbance whilst building or occupying a nest, and against disturbance of dependent young.

2.3 Certain species have also been identified as Priority Species under Schedule 41 of the Natural Environment and Rural Communities (NERC) Act (2006) (formerly known as UK BAP priority species) along with species listed on the Barnsley Biodiversity Action Plan.

Status

2.4 In addition to statutory protection, some bird species are classified according to their conservation status, such as their inclusion on the Red and Amber lists of Birds of Conservation Concern (BoCC) in the UK[1]:

- Red list (high conservation concern) species are those that are globally threatened according to IUCN criteria; those whose population has declined rapidly (50% or more) in recent years; and those that have declined historically and not shown a substantial recent recovery.
- Amber list (medium conservation concern) species are those with an unfavourable conservation status in Europe; those whose population or range has declined moderately (between 25% and 49%) in recent years; those whose population has declined historically but made a substantial recent recovery; rare breeders; and those with internationally important or localised populations.
- Green list (low conservation concern) species fulfil none of the above criteria.

[1] Eaton MA, Aebischer N, Brown A, Hearn R, Lock L, Musgrove A, Noble D, Stroud D and Gregory RD (2016) *irds of Conservation Concern the population status of birds in the nited ingdom Channel slands and the sle of an*. British Birds 108, pp708-746

3.0 METHODOLOGY

Desktop Study

3.1 A desktop survey was undertaken for existing ecological data regarding statutorily and non-statutorily habitats / sites of interest to nature conservation and protected bird species. The following organisations were contacted:

- Multi Agency Geographic Information for the Countryside (MAGIC) website[2]
- Sheffield City Ecology Unit
- Rotherham Biological Records

3.2 The desk study also made use of information from the recent county annual bird reports, The Yorkshire Bird Report 2008 as published by the Yorkshire Naturalist Union. The abundance of species referred to by these reports follows the following criteria:

- Vagrant – Up to 10 records in total since records began.
- Rare – 0-10 individuals each year in the past 10 years
- Scarce – 11-100 individuals each year in the past 10 years
- Uncommon – 101-1000 individuals each year in the past 10 years
- Fairly Common – More than 1000 records per year
- Common – More than10,000 records per year
- Abundant – More than 50,000 records per year

Breeding Bird Field Surveys

3.3 The survey methodology employed was broadly based on that of territory mapping[3] as used for the British Trust for Ornithology (BTO) Common Bird Census (CBC). Standard BTO species codes and symbols for bird activities were used to identify birds and denote activity, sex and age where appropriate. The criteria used in the assessment of breeding birds has been adapted from the standard criteria proposed by the European Ornithological Atlas Committee[4] and are grouped into three categories: possible breeder, probable breeder and confirmed breeder. Birds that were considered to be not using the site for breeding were categorised as 'non breeders'. Breeding evidence used in this report follows EOAC guidelines 1979, as shown in Appendix A.

3.4 To provide a reasonable level of accuracy for determining the population status of the breeding birds on the site, three surveys were undertaken during the hours after dawn in the period April to June 2015. A route was mapped out prior to the surveys being undertaken, paying particular attention to any linear features, such as hedgerows and tree lines, and natural features such as ponds and areas of woodland / scrub. Bird surveys were not undertaken in unfavourable conditions such as heavy rain or strong wind, which may negatively affect the results, see Table 1 for weather data.

[2] http://www.magic.defra.gov.uk/
[3] Bibby, C.J., N.D. Burgess & D.A. Hill, 2000: Bird Census Techniques: 2nd Edition. London: Academic Press
[4] EOAC, 1979. Categories of Breeding Bird Evidence. European Ornithological Atlas Committee.

Table 1 Survey ates and Conditions

ate	Cloud Cover ( )	ain	ind	isibility
30/04/2015	60%	Light Drizzle	Light Breeze	Excellent
27/05/2015	95%	None	Light Breeze	Excellent
22/06/2015	80%	None	Light Breeze	Excellent

Species & Assemblage Assessment

3.5 The CIEEM guidance on ecological impact assessment assesses nature conservation importance within a geographical context. To attain each level of importance, an ornithological resource or one of the features (species population or assemblage of species) should meet the criteria set out in Table 2. In some cases, professional judgment may be required to increase or decrease the allocation of importance, based upon local knowledge.

3.6 The county annual bird report, The Yorkshire Bird Report 2012 as published by the Yorkshire Naturalist Union, was consulted to inform the assessment. The abundance of species referred to by these reports follows the following criteria:

- Vagrant – Up to 10 records in total since records began.
- Rare – 0-10 individuals each year in the past 10 years
- Scarce – 11-100 individuals each year in the past 10 years
- Uncommon – 101-1000 individuals each year in the past 10 years
- Fairly Common – More than 1000 records per year
- Common – More than10,000 records per year
- Abundant – More than 50,000 records per year

Table 2. Evaluation Criteria

Nature Conservation alue	E amples of Selection Criteria
nternational	A species which is part of the cited interest of an SPA and which regularly occurs in internationally or nationally important numbers. A species present in internationally important numbers (>1% of international population).
National	A species which is part of the cited interest of a SSSI and which regularly occurs in nationally or regionally important numbers. A nationally important assemblage of breeding or over-wintering species. A species present in nationally important numbers (>1% UK population). Rare breeding species (<300 breeding pairs in the UK).

Nature Conservation alue	E amples of Selection Criteria
egional	Species listed as Priority Species under Schedule 41 of the Natural Environment and Rural Communities (NERC) Act (2006), which are not covered above, and which regularly occurs in regionally important numbers. Species present in regionally important numbers (>1% of regional population). Sustainable populations of species that are rare or scarce within a region. Species on the BoCC Red List and which regularly occurs in regionally important numbers.
County	Species listed as Priority Species under Schedule 41 of the Natural Environment and Rural Communities (NERC) Act (2006), which are not covered above and which regularly occurs in county important numbers Species present in county important numbers (>1% of county population). Sustainable populations of species that are rare or scarce within a county, or listed as priority species for nature conservation under S41 of the NERC Act. A site designated for its county important assemblage of birds (e.g. a SINC Site). Species on the BoCC Red List and which regularly occur in county important numbers.
Local	Other species of conservation interest (e.g. all other species on the BoCC Red and Amber List or listed as Priority Species under Schedule 41 of the NERC Act (2006) which are not covered above) regularly occurring in locally sustainable populations. Sustainable populations of species which are rare or scarce within the locality.
Site	Species that are common and widespread

4.0 RESULTS AND EVALUATION

Desk Study

4.1 There were no statutory or non-statutory sites within the search area that had received designated status as a result of the bird assemblages they support however during an Local Wildlife Site (LWS) assessment of Short wood and Hey Green LWS, breeding dunnock *Prunella modularis* , bullfinch *Pyrrhula pyrrhula* and song thrush *Turdus philomelos* were recorded.

4.2 A LWS assessment of Barrow Colliery was also made and this too was not afforded designation for it's avian intrest however UKBAP bird species recoded during the survey did include: Skylark *Alauda arvensis* linnet *Carduelis cannabina* yellowhammer *Emberiza citronella* grey partridge *Perdi perdi* dunnock bullfinch and song thrush

4.3 Rotherham Biological Records provided a large number of records for bird species from the search area surrounding the site including a number of 'notable' species as listed in Table 3.

Table 3. Notable Bird Species ecorded ithin the Site as provided by Sheffield City Ecology nit.

Species		C [1]	NE C[2]
ed List[3]			
Black-Tailed Godwit	*imosa limosa*	X (M)	X
Corn Bunting	*iliaria calandra*		X

Species		C [1]	NE C[2]
Cuckoo	*Cuculus canorus*		X
Curlew	*umenius ar uata*		X
Fieldfare	*Turdus pilaris*	X (M)	X
Grasshopper warbler	*ocustella naevia*		X
Grey Partridge	*Perdi perdi*		X
Grey Wagtail	*otacilla cinerea*		
House Sparrow	*Passer domesticus*		X
Lapwing	*anellus vanellus*		X
Lesser Spotted Woodpecker	*endrocopos minor*		X
Linnet	*Carduelis cannabina*		X
Merlin	*Falco columbarius*	X(R)	
Mistle Thrush	*Turdus viscivorus*		
Redwing	*Turdus iliacus*		X
Ring Ouzel	*Turdus tor uatus*		X
Skylark	*Alauda arvensis*		X
Song Thrush	*Turdus philomelos*		X
Spotted Flycatcher	*uscicapa striata*		X
Starling	*Sturnus vulgaris*		X
Tree Pipit	*Anthus trivialis*		X
Tree Sparrow	*Passer montanus*		X
Turtle Dove	*Streptopelia turtur*		X
Willow Tit	*Poecile montanus*		X
Yellowhammer	*Emberiza citrinella*		X
Yellow Wagtail	*otacilla flava subsp flavissima*		x
Amber List[3]			
Bullfinch	*Pyrrhula pyrrhula*		X
Dunnock	*Prunella modularis*		X
Greenshank	*Tringa nebularia*	X(M)	
House Martin	*elichon urbica*		
Kestrel	*Falco tinnunculus*		
Kingfisher	*Alcedo atthis*	X(R)	
Meadow Pipit	*Anthus pratensis*		
Pink-Footed Goose	*Anser brachyrhynchus*		
Redshank	*Tringa totanus*		
Redstart	*Phoenicurus phoenicurus*		
Reed Bunting	*Emberiza schoeniclus*		
Short-Eared Owl	*Asio flammeus*		
Stock Dove	*Columba oenas*		
Wigeon	*Anas penelope*		

Species		C [1]	NE C[2]
Willow Warbler	*Phylloscopus trochilus*		
Green List[3]			
Barn Owl	*Tyto alba*	X(R)	
Brambling	*Fringilla montifringilla*	X(M)	
Firecrest	*egulus ignicapilla*	X(R)	
Little Ringed Plover	*Charadrius dubius*	X(R)	

[1] Birds listed on Schedule 1 of the Wildlife and Countryside Act (1981) as amended. (M) indicates non-breeding / migratory species, and (R) indicates resident / migratory species that may breed in Yorkshire.

[2] Birds listed as Priority Species on Section 41 of the NERC Act 2006.

[3] The bird population status on the RSPB Birds of Conservation Concern (BoCC) list. Red and amber lists are declining species.

Breeding Bird Survey

Summary of the 2 1 Breeding Bird ield Surveys

4.4 A total of 32 bird species were recorded during the breeding bird surveys in 2015. Of the species observed, 11 are either protected, appear on the RSPB BoCC as declining (red or amber lists); or are identified as priority species for nature conservation under S41 of the NERC Act. A full list of results can be found in Appendix B, whilst the recorded locations of the 13 notable species can be found on Figure 1 and detailed in Table 4.

4.5 Of the 32 species recorded, 11 were confirmed as breeding; blackbird *Turdus merula*, blue tit *Parus caeruleus*, bullfinch *Pyrrhula pyrrhula*, carrion crow *Corvus corone*, goldfinch *Carduelis carduelis*, great tit *Parus major*, long-tailed tit *Aegithalos caudatus*, magpie *Pica pica*, mallard *Anas platyrhynchos*, moorhen *Gallinula chloropus* and woodpigeon *Columba palumbus*. A further 10 species were considered probable breeders whilst the remaining 13 species were considered to be possible or non-breeders.

Table . Protected Species of Principal mportance, BoCC ed and mber Listed Bird Species ecorded on site during Breeding Bird Surveys 2 1 and their ecent Status ithin or shire.

Species	Conservation Status	Pea Count Survey ccasions ecorded	Breeding Status	ecent Status ithin or shire
Black-headed Gull	Amber List	1/1	Non-breeder	Common breeder and abundant in winter
Bulfinch	Amber List NERC ACT (S41)	5/2	Breeding	Uncommon breeder; scarce passage migrant / winter visitor
Dunnock	Amber List NERC ACT (S41)	3/3	Probable-breeder	Abundant resident; passage migrant
House sparrow	Red List NERC ACT (S41)	1 colony/2	Non-breeder	Abundant resident but has decreased

Species	Conservation Status	Pea Count Survey ccasions ecorded	Breeding Status	ecent Status ithin or shire
Kestrel	Amber List	1/1	Non-breeder	Fairly common resident and passage migrant
Mallard	Amber List	2/1	Confirmed Breeder	Fairly common breeder; common migrant and winter visitor
Reed bunting	Amber List NERC ACT (S41)	1/2	Probable-breeder	Fairly common breeding resident and passage migrant
Skylark	Red List NERC ACT (S41)	2/3	Probable-breeder	Common resident; passage migrant and winter visitor
Starling	Red List NERC ACT (S41)	40/3	Non-breeder	Abundant but decreasing resident, passage migrant and winter visitor
Willow warbler	Amber List	7/3	Probable-breeder	Common to abundant breeding summer visitor and passage migrant
Yellowhammer	Red List NERC ACT (S41)	1/1	Non-breeder	Fairly common resident and passage migrant

escription

4.6 Many habitats are of recent origin, having been created as part of a restoration scheme of the former colliery site. Habitats on site include areas of open improved pasture, recent plantation woodland/scrub and open water with associated reeds/ephemeral habitats. The following provides a summary of the breeding bird assemblages recorded during the breeding bird surveys within these different habitat types.

- **rassland –** large areas of improved grassland with smaller areas of semi/unimproved grassland were present on-site. The grasslands generally supported few bird species however swallow were recorded foraging overhead presumably due to the high numbers of winged invertebrates resulting in part no-doubt from the presence of diary cattle. Rook were also recorded foraging within the grassland areas, also believed to be in connection with the cattle. No skylark were recorded during any of the surveys within these compartments which although the habitats were considered to be suitable, the intensive grazing regime was considered to cause levels of disturbance greater than that which skylark, or other ground nesting birds, were willing to tolerate.
- **Plantation –** compartments of young mixed species plantation were present located throughout the site. These areas offered suitable foraging and nesting habitat to a wide number of woodland edge specialists including long-tailed tit, robin *Erithacus rubecula*, wren *Troglodytes troglogytes*, magpie *Pica pica*, chaffinch *Fringilla coelebs*, great tit *Parus major*, blue tit *Parus caeruleus*, willow warbler *Phylloscopus trochilus*, blackcap *Sylvia atricapilla*, blackbird and wood pigeon. Active carrion crown and wood pigeon nests were recorded within

these areas along with a number of disused carrion crow and wood pigeon nests from previous attempts.

- **aterbodies** – two waterbodies were present within the survey area associated with which were all of the aquatic species including mallard, moorhen, reed bunting and reed warbler. The northernmost pond held the majority of the species with mallard, moorhen, reed bunting and reed warbler all present with only moorhen present on the southern waterbody. The northernmost waterbody was densely vegetated with a variety of emergent aquatic plants with only a small area of open water and had large quantities of deep silt. The southernmost waterbody was densely fringed with common reed *Phragmites australis* with a central area of open water and firm banks which dropped vertically away into several feet of water. Although no nests were observed, behaviour strongly indicative of nesting was present from all of the above species with moorhen chicks being recorded.
- **edgero s, Scrub –** Hedgerows abounded several of the fields, often forming the boundary between field compartments and the plantation woodland. These areas offered nesting and foraging opportunities for a variety of species including blackbird, dunnock, wren and robin. Whilst no nests were recorded within these areas they were considered to provide excellent opportunities for a range of species.
- **rable armland –** A small assemblage of birds indicative of farmland habitats were recorded including skylark and yellowhammer, both BoCC red list and Species of Principle Importance however these were recorded in very low numbers with peak counts of just 2 and 1 birds respectively. Yellowhammer was recorded during a single survey occasion and so not considered to be a breeding species with skylark being recorded on 2 survey occasions making this a probable breeder.

Evaluation

4.7 The breeding bird surveys have highlighted that the site supports a breeding bird assemblage typical of the habitats present on-site. The young plantation and scrub habitats that were considered to be of most note however these were still considered to be low in overall numbers with no particularly rare species or assemblages considered to be important. The breeding bird assemblage recorded is considered to be of no more than Local Nature Conservation Value.

4.8 This assessment is further supported by the results of the desktop study which, although a wide range of species records were highlighted, many of the records were of individual birds and not recently recorded – quite a number of which were over 15 years old. It should also be noted that this area is well watched with a number of very active local birders and so the consultation results are considered to be up-to-date and comprehensive. The results were also typical both of such habitats as contained within the site and the local area.

Site Proposals

4.9 At the time of writing the site proposals were for the majority of the habitats retained on-site to be lost to mixed use industrial development with associated infrastructure. All grassland is to be lost and the majority of the plantation woodland with the exceptions of two belts along the western boundaries.

Potential mpacts ssociated ith Site Proposals

4.10 The impact on breeding bird species arising from the potential effects of any of the considered proposals is based upon an understanding of each species' ecological requirements, the number of birds recorded on site, their nature conservation criteria based on legislation and current guidance (e.g. Red and Amber listed Birds of Conservation Concern 4 (2016); Species listed as principal importance (S.41 NERC Act) and Local BAP species), their county status according to The Birds of Yorkshire Annual Reports and professional judgement.

4.11 A retained section of habitat is present along the western end of the southern part of the site. This area was considered to provide good connectivity for a range of species due to the variety of habitats present within the area including unimproved grassland, scrub and aquatic. To the north of this area, separated by the A6195, is a wildlife mitigation area containing habitats largely similar to those described above within the application boundary and connected by an underpass. Whilst this underpass was not considered to provide optimal connectivity, numerous bird species, including smaller tit species were noted to cross between the two areas over the A6195 and by retaining this area it is considered that the ability of birds to pass between the northern and southern sections of the site will not be impeded.

4.12 The species recorded on site that are arguably the most vulnerable to impacts resulting from the proposed development are the 7 species which are listed as BoCC Red list Species and/or those listed on the NERC ACT (S41). The habitat requirements, species account and nature conservation value of these 7 species are summarised in Table 4.

Table . Evaluation of Species Considered Potentially Sensitive to Site Proposals

Species	abitat e uirements[1]	Species ccount Notes	Nature Conservation alue[2]
Bullfinch	Breeds mainly in broad-leaved woods, but also commonly in dense hedgerows and thickets. Adults are vegetarian, but invertebrates are important in diet of young.	Single birds recorded on two occasions to the south west of the site where established hedgerows occur. The majority of the site provides unsuitable habitat and therefore poor opportunities to the species.	**Site**
unnoc	Commonly invades a wide variety of scrub grown situations. Has adapted to field hedgerows, farms, railway embankments, parks, gardens and vacant urban land. Feeds mainly on insects but small seeds are an important winter food.	The small number recorded was restricted to boundary hedgerows along the southern and eastern boundaries. Breeding was confirmed when an adult was observed carrying food.	**Local**
ouse sparro	Often associated with man, will avoid closed or dense vegetation, and except for seasonal foraging in corn fields and other crops, will usually avoid open terrain lacking in shrubs, trees, and other cover.	Colonies were recorded within the southern most field compartment in association with the residential development.	**Local**

Species	abitat e uirements[1]	Species ccount Notes	Nature Conservation alue[2]
eed bunting	Traditionally a bird of wet places such as reedbeds, river margins, fens, marshes and coastal grazing marshes. More recently colonised drier habitats such as ditches, young forestry plantations and some farm crops, especially oilseed rape.	Two or three pairs present to the south of the site associated with grassland, small ponds and young plantation woodland.	**Local**
S ylar	Ground nesting birds favouring open farmland habitats where short, grassy or sparse vegetation provides nesting cover and foraging opportunities. Plant and animal material taken at all times of the year, but insects especially important in summer, and cereal grain in spring.	Singing birds scattered around the site within open grassland. Several pairs considered to have bred.	**Local**
Starling	During breeding season will concentrate where suitable holes are available, either naturally or in apertures of buildings. Invertebrate food fed to young. Forages mainly on the ground in open areas of short grass or sparse vegetation, e.g. cereal stubble, farmyards.	Occurred in small numbers at the south of the site. Areas of grassland offer some foraging opportunities. Breeding considered possible.	**Site**
ello hammer	Traditionally based on edges of open areas of forest and fringing scrub of gorse, broom and hawthorn. Extends widely across cultivated land with hedges, plantations, and paths. Feeds mainly on grass seeds, invertebrates in the breeding season. Feeds wholly on the ground by hedges, tracks and newly sown fields.	A single singing male was seen on one survey occasion the northern most field compartment. Whilst habitats were considered suitable for breeding, the single sighting of this usually gregarious species suggests that the bird was just passing through site.	**Local**

[1] Snow & Perrins, 1998
[2] Based upon criteria set out in Table 2 and professional judgement.

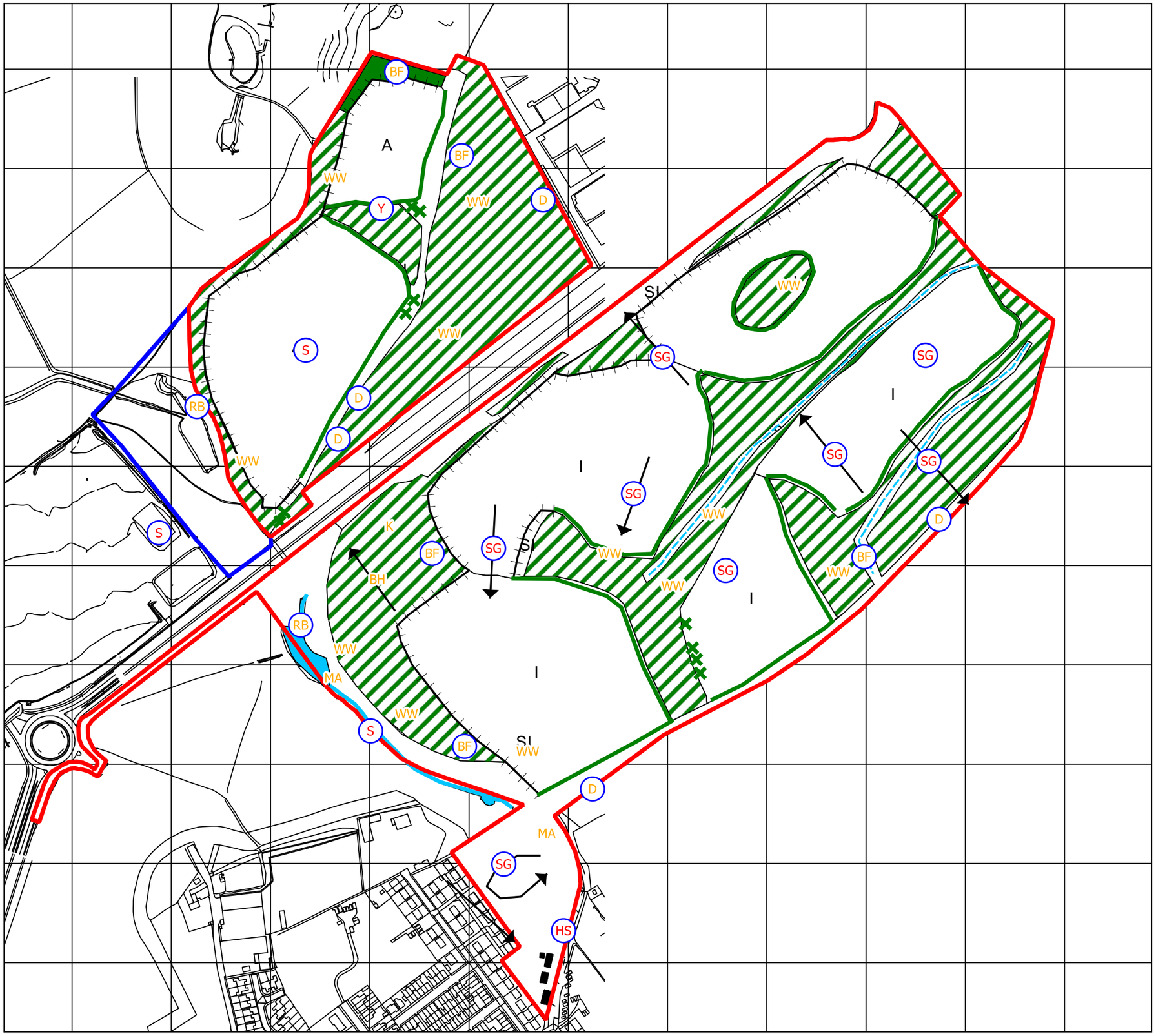
4.13 The site is not considered to support any bird species considered to be particularly sensitive to disturbance with the vast majority of species recorded being typical of urban/suburban habitats whilst the remainder, including yellow hammer, whilst typically found in rural areas are not particularly sensitive to disturbance.

4.14 It should however be noted that some disturbance will occur from activities including construction work, mainly machinery noise and construction personnel. Such impacts could potentially cause the temporary displacement of some birds from the site and a consequent reduction in breeding success.

4.15 Proposals include the siting and operation of industrial units which will also create potential impact disturbance to birds particularly around the edges of the development. Whilst all species recorded were considered to be relatively tolerant of disturbance, light spill onto boundary habitats including hedgerows could potentially deter or even prevent bird species from roosting

here. The use of directional lighting / shorter lighting columns to reduce light spill onto these areas will reduce or even eliminate any disturbance caused by lighting.

4.16 Direct habitat loss will occur as a result of the siting of the units and this is unavoidable however as described above and shown within the Breeding Bird Survey Results Plan a low number of species of conservation concern were recorded on-site and thus a correspondingly low number of species and individuals thereof are to potentially be disturbed. Of those species it is considered that willow warbler – a species often associated with scrub / young plantation are to be displaced the most however habitats present within the local area, particularly immediately to the north are considered highly suitably to support this species, perhaps more so than the habitats present on-site. The loss of grassland will also recuse the number of flying insects within the local area upon which swallow were seen feeding. Given the migratory nature of this species and the large number of identical fields within the local area it is considered that no adverse effect to this species will occur.



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Key

BoCC Red Listed Species

- HS House Sparrow
- S Skylark
- SG Starling
- Y Yellowhammer

BoCC Amber Listed Species

- BH Black-headed Gull
- BF Bullfinch
- D Dunnock
- K Kestrel
- MA Mallard
- RB Reed Bunting
- WW Willow Warbler
- Y Yellowhammer

Birds listed on Section 41 of the NERC Act 2006

Birds listed on Schedule 1 of the Wildlife and Countryside Act (1981)

Bird only seen to fly over at this location

Site Boundary

Wider Survey Area

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Harworth Estates Ltd.
Rockingham Business Park, Barnsley

BREEDING BIRD SURVEY RESULTS PLAN

N

Scale: 1:1 OGJ / JD 20/1/2016

Figure 1 **6424-E-01**

J:\6400\6424\QGIS\Plans\6424-E-02 BBS Results Plan.qgs

Appendix A: EOAC Criteria for Categorisation of Breeding Status

Confirmed Breeder -

- Distraction display or injury feigning
- Used nest or eggshells found from this season
- Recently fledged young or downy young
- Adults entering or leaving nest-site in circumstances indicating occupied nest
- Adult carrying faecal sac or food for young
- Nest containing eggs
- Nest with young seen or heard

Probable Breeder – (Evidence accumulated during the survey indicates that the bird species is breeding on site)

- Pair in suitable nesting habitat
- Permanent territory (defended over at least 2 survey occasions)
- Courtship and display
- Visiting probable nest site
- Agitated behaviour
- Brood patch of incubating bird (from bird in hand)
- Nest building or excavating nest-hole

Possible breeder – (Evidence accumulated during the survey indicates that the bird species could be breeding on site, but the evidence is less conclusive than that obtained for probable breeders)

- Observed in suitable nesting habitat
- Singing male

Non-breeder -

- Flying over
- Migrant
- Summering non-breeder
- Observed in unsuitable nesting habitat

Appendix B: Breeding Bird Survey Results 2015

Species	Latin	Survey 1	Survey 2	Survey 3	Conservation Status
Blackbird	*Turdus merula*	6	5	5	Green list
Blackcap	*Sylvia atricapilla*	4	2	0	Green list
Black-headed Gull	*Chroicocephalus ridibundus*	0	0	1	Amber list
Blue tit	*Cyanistes caeruleus*	7	0	1 + 1 family	Green list
Bulfinch	*Pyrrhula pyrrhula*	5	0	2	Amber list NERC S.41
Carrion crow	*Corvus corone*	6	1	7 + 1 family	Green list
Chaffinch	*Fringilla coelebs*	4	3	1	Green list
Chiffchaff	*Phylloscopus collybita*	1	3	2	Green list
Dunnock	*Prunella modularis*	3	2	1	Amber list NERC S.41
Feral Pigeon	*Collumba livia domestica*	20	0	30	Green list
Goldfinch	*Carduelis carduelis*	1	0	1	Green list
Great tit	*Parus major*	4	3	1	Green list
House sparrow	*Passer domesticus*	1 Colony	0	1 colony	Red list NERC S.41
Jackdaw	*Corvus monedula*	7	5	13	Green list
Jay	Garrulus glandarius	1	0	1	Green list
Kestrel	*Falco tinnunculus*	1	0	0	Amber list
Long-tailed Tit	*Aegithalos caudatus*	8	1	1 Family	Green list
Magpie	*Pica pica*	11	5	7	Green list
Mallard	*Anas platyrhynchos*	2	0	0	Amber list
Moorhen	*Gallinula chloropus*	0	1 family	2	Green list
Reed bunting	*Emberiza schoeniclus*	1	0	1	Amber list NERC S.41
Reed warbler	*Acrocephalus scirpaceus*	0	1	2	Green list
Robin	*Erithacus rubecula*	4	0	2	Green list

Species	Latin	Survey 1	Survey 2	Survey 3	Conservation Status
Rook	*Corvus frugilegus*	15	1	13	Green list
Skylark	*Alauda arvensis*	2	1	1	Red list NERC S.41
Starling	*Sturnus vulgaris*	40	3	3	Red list NERC S.41
Swallow	*Hirundo rustica*	11	2	10	Green list
Whitethroat	*Sylvia communis*	0	0	1	Green list
Willow warbler	*Phylloscopus trochilus*	7	4	3	Amber list
Woodpigeon	*Columba palumbus*	23	20	21	Green list
Wren	*Troglodytes troglodytes*	3	3	2	Green list
Yellowhammer	*Emberiza citronella*	0	0	1	Red list NERC S.41
Total No. Species – 32 Species		**27**	**19**	**29**	

Harworth Estates

oc ingham Business Par , Barnsley

Appendix 7.5 - Reptile Survey Report

August 2016

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		OGJ / 16 02.2016	EJF / 16.02.2016	RJS / 12.07.2016

CONTENTS

1.0 INTRODUCTION 2

2.0 LEGISLATION 2

3.0 METHODOLOGY 3

4.0 RESULTS & ASSESSMENT 4

5.0 DISCUSSION 5

TABLES

Table 1: Reptile Survey Results

FIGURES

Figure 1: Refugia Location Plan

1.0 INTRODUCTION

1.1 The following report has been prepared by FPCR Environment & Design Ltd on behalf of Harworth Estates Ltd. and details the findings of reptile surveys undertaken on a site adjacent to Shortwood Business Park, Barnsley. The need for further surveys of this group was identified during an initial habitat assessment carried out in April 2015.

Site Location and Context

1.2 The subject site is located adjacent to the west of Shortwood Business Park in Barnsley, South Yorkshire (central grid ref: SE356 010) and includes parcels of land to the north and south of the A6195 duel carriageway. The subject site consists of a former quarry restored to arable and improved pasture with associated native hedgerows and plantation broad-leaved woodland. An attenuation pond, drainage channel (partially culverted) and associated semi-improved grassland are in the southwest and further limited parcels of semi-improved grassland are associated with plantation margins.

1.3 In terms of surrounding habitats, the existing residential development of Birdwell is situated to the north west and to the south the more extensive residential area of Hoyland. Junction 36 of the M1 Motorway lies less than 600m to the west. The surrounding land use is largely arable and pasture with an area of broad-leaved semi-natural woodland to the north.

Proposals

1.4 Proposals are for a mixed use development including B1, B2 and D1 uses.

2.0 LEGISLATION

2.1 All common reptile species, including slow-worm *Anguis fragilis*, common lizard *ootoca vivipara* and grass snake *atri natri* , are partially protected under Sections 9(1) and 9(5) of Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). This legislation protects these animals from:

- intentional killing and injury;
- selling, offering for sale, possessing or transporting for the purpose of sale or publishing advertisements to buy or sell a protected species.

2.2 This partial protection does not directly protect the habitat of these reptile species. Where these animals are present on land that is to be affected by development, the implications of legislation are that providing that killing can reasonably be avoided then an operation is legal.

2.3 All reptile species are Species of Principal Importance under Section 41 of the NERC Act (2006).

3.0 METHODOLOGY

Desktop study

3.1 In order to compile existing baseline information, relevant ecological information was requested from both statutory and non-statutory nature conservation organisations including:

- Rotherham Biological Records Centre (RBRC)
- Sheffield Biological Records Centre (SBRC)
- Natural England via the Multi Agency Geographic Information for the Countryside (MAGIC) interactive map (http://magic.defra.gov.uk/website/magic/)

3.2 Further inspection, using colour 1:25,000 OS base maps (www.ordnancesurvey.co.uk) and aerial photographs from Google Earth (www.maps.google.co.uk), was also undertaken in order to provide additional context and identify any features of potential importance for nature conservation in the wider countryside.

Field survey

abitat ssessment

3.3 An initial assessment of the sites suitability for reptiles was undertaken during the phase 1 habitat assessment on the 13th April 2015. This included noting the following:

- Suitable habitats such as less intensely-managed arable margins, grassland, scrub, woodland edge, ditches.
- Suitable habitat mosaics or 'eco-tones' between adjoining habitat where a range of environmental conditions were created which would be conducive with reptile potential.
- Piles of rubble, spoil, timber or other waste which may form refugia or hibernacula.

Presence bsence Surveys

3.4 A strategic reptile presence / absence survey was undertaken at specific locations identified as offering potential habitat within the area of survey. The survey was undertaken based on methodology detailed in the *Herpetofauna or ers anual* and *the Froglife Advice Sheet*

3.5 Methods involved a search for basking reptiles on/under naturally occurring and strategically positioned artificial refugia. The artificial refugia used were 0.5m^2 sections of roofing felt with a black upper side. These were placed in locations that offered the most suitable habitat for common reptiles i.e. along the wet ditch. A total 46 artificial refugia were placed on the site within suitable habitat. The location of refugia is shown in Figure 1.

3.6 All of the surveys were undertaken between June and September 2015 by suitably experienced FPCR ecologists. The surveys were carried out in appropriate weather conditions i.e. air temperature between 9 and 18°C, no strong wind or heavy rain. The exact timings conditions are shown in the results section below.

---

[1] Gent and Gibson (1998) *Froglife Advice Sheet – eptile Survey Herpetofauna or ers anual*

[2] Froglife Advice Sheet 10: An introduction to planning, conducting and interpreting surveys for snake and lizard conservation http://www.froglife.org/documents/FroglifeAdviceSheet10.pdf

3.7 In addition, the surveys also followed the guidelines recommendations by:

- Approaching refugia from downwind and avoiding casting a shadow and with care so as to not disturb basking animals when checking;
- Lifting and replacing tins, to check for the presence of reptiles underneath in hot weather is undertaken with care, to avoid potential harm to any animals underneath;

Limitations

3.8 Due to some poor conditions in July and August, some surveys were delayed to ensure they were undertaken during appropriate weather conditions. However September is still considered to be an optimal time to survey for reptiles, so results are considered to be appropriate for identifying the status for reptiles on site.

4.0 RESULTS & ASSESSMENT

Desktop study

4.1 No sites designated for their populations of reptiles were identified within the search area and no records of reptiles from within the past 10 years were located within 1km of the site boundary.

abitat ssessment

4.2 The south of the site comprised 5 compartments of improved grassland in association with several young plantation woodland compartments and semi-improved grassland margins. While the margins between woodland and grassland provided some suitable habitat for reptile species, the majority of these areas were characterised by grassland compartments that abruptly abutted woodland habitats providing a limited extent of edge habitat favoured by reptile species. These areas were therefore considered unsuitable for further survey. The north of the site comprised two arable fields and a plantation woodland compartment. Reptile refugia were placed along habitats that were considered suitable for reptile species including:

- A wet ditch and 2 ponds were present along south-western boundary of the site offering suitable foraging habitat for grass snake.
- A dry ditch on the south-east of the site offered seasonally wet habitat for foraging grass snake.

Presence bsence Surveys

4.3 During these surveys no reptiles were recorded, Table 1 presents the full survey conditions, timings and results.

Table 1 eptile Survey esults

Survey ccasion	ate	Time	eather	eptile Sightings
1	04.06.15	08:00	Sunny, 14°C	None
2	08.06.15	08:50	Sunny, cloud cover, 13°C	None
3	04.09.15	09:00	Overcast, 13°C	None
4	10.09.15	17:00	Cloud cover, 15°C	None
5	21.09.15	17:15	Sunny, cloud cover, 15°C	None
6	25.09.15	17:00	Sunny, cloud cover, 13°C	None
7	29.09.15	17:15	Sunny, 14°C	None

5.0 DISCUSSION

5.1 Although habitats within the site were considered to provide some potential for occupation by reptile species, none were recorded during the presence/absence surveys undertaken in 2015. It is possible that the isolation of the site by surrounding roads and residential development has prevented colonisation.

5.2 Therefore, based on the above, it is considered that the presence of reptiles can be reasonably discounted and that there are no constraints to the proposals from the presence of reptile species. As such no further survey or mitigation is considered necessary.

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- Site Boundary
- Refugia Location
- Broadleaved woodland - plantation
- Broadleaved woodland - semi-natural
- Buildings
- A Cultivated/disturbed land - arable
- I Improved grassland
- SI Poor semi-improved grassland
- Standing water
- Dry ditch
- Fence
- Intact hedge - species-poor
- Standing water

Harworth Estates Ltd.
Rockingham Business Park, Barnsley

REPTILE REDUGIA LOCATION PLAN

N

Scale: 1:4,000 @A3 OGJ / RJS 12/7/2016

Figure 1 **6424-E-01**

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Harworth Estates

oc ingham Business Par , Barnsley

Appendix 7.6 – Water Vole Survey Report

June 2016

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ev	ssue Status	Prepared ate	pproved ate
-	Draft 1	TPE / 08.06.16	JD / 12.07.16

CONTENTS

1.0 INTRODUCTION 2

2.0 LEGISLATION AND POLICY 3

3.0 METHODOLOGY 3

4.0 RESULTS 4

5.0 DISCUSSION 5

FIGURES

Figure 1: Site Location and Water Vole Survey Results Plan

1.0 INTRODUCTION

1.1 This report has been prepared by FPCR Environment and Design Ltd. on behalf of Harworth Estates Ltd. and provides details of a water vole *Arvicola amphibious* survey undertaken upon land to the south of the Dearne Valley Parkway (A6195), Hoyland, Barnsley. The objective of the study was to assess the potential ecological implications associated with the proposed development of a business park.

Site Location and Context

1.2 The subject site comprises a water course which forms part of the western boundary of the proposed land which comprises land to the south and north of the the A6195 dual carriageway. To the north / northwest lies arable farmland beyond which is the existing residential development of Birdwell, to the northeast, Short Wood and Short Wood Business Park, to the south the more extensive residential area of Hoyland. Junction 36 of the M1 Motorway lies around 800m to the west. The surrounding land use comprised largely arable and pasture with an area of broadleaved semi-natural woodland to the north.

1.3 The proposed development site consists of a former quarry restored to arable and improved pasture with associated native hedgerows and mixed plantation woodland. An attenuation body, drainage channel (partially culverted) and associated area of semi-improved grassland are present on site with further limited parcels of semi-improved grassland being associated with plantation margins.

1.4 Proposals for the wider site are for a business park development/industrial type units with associated parking, service yards, compounds and infrastructure.

2.0 LEGISLATION AND POLICY

2.1 Water voles are fully protected under The Wildlife and Countryside Act 1981 (as amended). This makes it an offence to:-

- Intentionally kill, injure or take water voles;
- Possess or control live or dead water voles or derivatives;
- Intentionally or recklessly damage, destroy and obstruct access to any structure or place used by water voles for shelter or protection;
- Intentionally or recklessly disturb water voles whilst they are using such a place:
- Sell water voles or offer to expose for sale or transport for sale:
- Publish or cause to publish any advertisement which conveys the buying or selling of water voles.

2.2 Water voles are listed as a Species of Principal Importance under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006. Water voles are listed as a priority species within the Barnsley Biodiversity Action Plan[1].

3.0 METHODOLOGY

es top Survey

3.1 As part of this study Parks and Countryside Sheffield and Rotherham Biological Records Centre were consulted for any records for protected species including water voles within a 1km radius of the site.

ield Survey

3.2 An initial Extended Phase 1 survey highlighted some limited potential for water vole within the site. Further detailed survey was considered advisable to fully assess the potential and any likely impacts.

3.3 The water vole survey area consisted of a single ditch (D1) and pond (into which the ditch entered / exited) situated to the south of site totalling approximately 350m (Figure 1). The ditch was surveyed up stream of this to a point beyond which the ditch ceased to hold water and downstream of the pond to a culverted section which extends approximately 150m to a second waterbody.

3.4 A presence and absence field survey was undertaken on 2nd June 2016 by a suitably experienced ecologist using the standard methodology outlined within Strachen *et al* (2011)[2]. This involved searching the banks/margins of the drains and ditches for evidence of:

- *atrines* - distinct piles of water vole droppings found near nest sites, at the ranges of territorial boundaries and where the animals enter and leave the water;

[1] http://www.barnsleybiodiversity.org.uk/SAP3%20water%20vole.pdf
[2] Strachen, R, Moorhouse, T and Gelling, M (2011) Water Vole Conservation Handbook. Third edition

- *urro s* - burrow entrances are typically wider than high with a diameter between 4-8cm. Generally these burrow entrances are located at the water's edge;
- *Feeding Stations* - areas with distinct neat piles of chewed lengths of vegetation along pathways or haul out platforms along the water's edge;
- *Footprints* - identifiable prints in soft margins of the watercourse;
- *un ays* - low tunnels that are pushed through the vegetation and often leading to burrows or feeding stations.

3.5 Descriptions of the watercourse were also made to aid any enhancement or mitigation recommendations required.

Survey Limitations

3.6 Vegetation in some sections of the survey area was dense limiting access to / visibility of short sections of the ditch and pond. Despite this, sufficient sections of the survey areas were surveyed to reasonably determine the status of water vole on site.

4.0 RESULTS

Desktop Survey

4.1 During the consultations two water vole records were identified 2.5km from the site boundary with very poor connectivity, these both being situated within Worsborough Country Park, of these records the most recent of which was from 1994.

Field Survey

abitat ssessment

4.2 The majority of the water within length of the ditch was extremely shallow – less than 30mm in depth with very shallow sloping approximately <15^0 wet banks. The flow rate was considered to be moderate estimated at approximately 0.25m/s through most of the length with the substrate comprising of very soft silt – see photograph 1.

4.3 The pond measured approximately 55m by 10m and estimated to be around 1-2m in depth. The majority of the banks were heavily vegetated in common reed *Phragmites australis* as was a small part of the ditch above the pond. Rather sparse vegetation surrounded the banks of the ditch, with this mainly comprising of a variety of grasses and great willow herb *Epilobium hirsutum* with occasional bulrush *Typha latifolia*, hard rush *uncus infle us* and mare's tail *E uisetum arvense*

4.4 To the south of both the ditch and pond land comprised recently planted woodland chiefly Italian alder *Alnus cordata* with relatively sparse ground flora. To the north of the pond was a small area of short unimproved grassland with the area to the north of the ditch being largely the same as that to the south of it beyond which lies a footpath and further similar habitat – see photograph 2.

Photograph 1 itch 1	**Photograph 2 rea of semi-improved grassland to north of pond.**

ield Signs

4.5 No evidence, including latrines, prints, feeding evidence or runs, to confirm the presence of water vole was noted at the time of the survey in either the pond or ditch.

4.6 A large number tadpoles of both common frog *ana temporaria* and common toad *ufo bufo* were noted at the time of survey and occasional evidence of bank vole *Clethrionomys glareolus* in the form of burrows was also noted.

5.0 DISCUSSION

5.1 The absence of local recent records and field signs indicates that the site is of negligible interest for water vole. The pond was considered to be the only feature on-site which offered any potential to support this species. The site is considerably separated from all surrounding records of water vole both in term of distance and connectivity, with all of the records being historical. It is therefore considered that if populations were still present in the wider area, individuals would be highly unlikely to colonise the limited area of suitable habitats within site. It is therefore considered that this species does not provide a constraint to the proposed development and that no further survey or mitigation is required.

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Legend

- Buildings
- Broadleaved woodland - plantation
- Standing water
- I Improved grassland
- SI Poor semi-improved grassland
- A Cultivated/disturbed land - arable
- Standing water
- Intact hedge - species-poor
- Fence
- Dry ditch

Harworth Estates

Rockingham Business Park, Barnsley

Site Location and Water Vole Survey Results Plan

Scale: 1:3000 JDH / JD 6/12/2019

Figure 1 -

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Harworth Group

earne alley Par ay, oc ingham, Barnsley – Phases 2 and 3

Biodiversity Impact Assessment

January 2020

PC Environment and esign Ltd
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-	Draft	JDH / 07.01.20	

CONTENTS

1.0 INTRODUCTION 3

2.0 METHODOLOGY 5

3.0 RESULTS 10

4.0 CONCLUSION 18

TABLES

Table 1: Habitat Distinctiveness

Table 2: Condition Weighting

Table 3: Multipliers for Different Categories of Delivery Risk

Table 4: Multipliers for Different Time Periods

Table 5: Biodiversity Units: Existing On-Site Habitats

Table 6: Biodiversity Units: Existing On-Site Hedgerows

Table 7: Biodiversity Units: Proposed On-site Habitats and Target Conditions

Table 8: Biodiversity Units: Proposed On-Site Hedgerows with Target conditions

FIGURES

Figure 1: Phase 1 Habitat Plan

Figure 2: Habitat Retention Plan

Figure 3: Habitat Creation Plan

APPENDICES

Appendix A: Biodiversity Impact Assessment Calculator Sheets

1.0 INTRODUCTION

1.1 This report has been prepared by FPCR Environment and Design Ltd on behalf of the Harworth Group in support of an outline planning application for a proposed commercial development located adjacent to Shortwood Business Park in Barnsley, South Yorkshire (central grid ref: SE 3563 0103).

Site Description

1.2 The 38.7ha Site largely comprises establishing plantation woodland and improved pasture, with associated native hedgerows along several linear edges of the plantation areas. Two compartments of species-poor grassland are located in the northern section of the Site. The northern and southern sections of the site are separated by the A6195 dual carriageway. A watercourse runs northwards through the south western area of the site, connecting to a pond located on the Sites western boundary. A belt of scattered scrub follows this watercourse along its eastern bank.

Proposals

1.3 Proposals are for a business park development comprising warehousing with associated parking, lorry compounds and access infrastructure, with landscaping and green-infrastructure, including attenuation facilities.

Offsetting Context

1.4 The overall aim of the biodiversity offsetting initiative is to provide a mechanism by which conservation activities are designed to deliver biodiversity benefits in compensation for losses, which can be delivered with a measurable outcome.

1.5 Using the biodiversity offsetting approach means that a developer employs a standardised formula to calculate the number of biodiversity ‘units’ to be lost as a result of their development, based on the habitat(s) and hedgerow(s) affected, their condition and extent. The developer then provides an ‘offset’ (where necessary) to deliver an equivalent number of biodiversity units; these ideally should be within the development boundary (habitat enhancement/creation) or off-site.

1.6 Biodiversity offsetting is to compensate for adverse impacts on biodiversity identified after appropriate avoidance, minimisation and on-site rehabilitation measures have been undertaken, according to the mitigation hierarchy as required by National Planning Policy Framework (NPPF, 2019 (as amended)). Any subsequent changes to planning proposals may affect the credit requirement of the site and a review of the changes would be required.

Legislative Context

1.7 The UK Government, as signatory to the Rio Convention on Biological Diversity, is committed to conserving and enhancing biodiversity. This commitment is further enforced in the Natural Environment and Rural Communities Act (NERC) 2006 and the Natural Environment White Paper (June 2011).

1.8 DEFRAs 25 Year Environment Plan (2018) seeks to embed a ‘net environmental gain’ principle for development to deliver environmental improvements locally and nationally. Current policy is

that the planning system should provide biodiversity net gains where possible however this is moving towards a mandatory requirement.

1.9 NPPF (2019) in particular seeks to ensure that the planning system contributes to and enhances the natural and local environment, protect and enhance biodiversity and geodiversity by:

d inimising impacts on and providing net gains for biodiversity including by establishing coherent ecological net or s that are more resilient to current and future pressures

b promote the conservation restoration and enhancement of priority habitats ecological net or s and the protection and recovery of priority species and identify and pursue opportunities for securing measurable net gains for biodiversity

1.10 The Barnsley local plan supplementary planning document: Biodiversity and Geodiversity states

The PA ill not support applications that ould damage the ecological net or and cause a net loss in biodiversity in line ith the PPF

1.11 With specific reference to sites located within the Nature Improvement Area the above document states:

ithin the A ature mprovement Area e re uire specific biodiversity enhancements ith developments over and above the minimum mitigation/ compensation measures……

…….Such quantifiable, significant benefits could include:

- *New woodland;*
- *New wetland;*
- *Enhancing areas of poor environmental quality;*
- *Improving public access or*
- *Improving the management of existing habitats;*

2.0 METHODOLOGY

Existing Value

2.1 The metric proposed by DEFRA is based on evaluating each individual habitat's value. The Warwickshire, Coventry and Solihull sub-region was chosen as one of the six national pilot areas to trial biodiversity offsetting between 2012 and 2014. The success of this pilot led to the continuing use of offsetting for all minor and major applications by all the LPAs within that sub-region. The Biodiversity Impact Assessment calculator (v19.1) used by the Warwickshire, Coventry, and Solihull sub-region, is considered to be a simple yet accurate method of measuring biodiversity gains/losses. The calculator is in excel format and is used to measure the biodiversity value of habitats and hedgerows within an application site before and after development, therefore calculating the expected biodiversity net loss or gain.

2.2 The mechanism for calculating biodiversity offsetting has not been fully implemented across all LPAs, so for this assessment of the outline application at Dearne Valley Parkway, FPCR have used the Warwickshire, Coventry and Solihull based metric. For the purpose of this outline application these calculations will provide an evidence-based indication of habitat loss and gain.

2.3 The development site is accurately mapped and divided into existing habitat criteria. This information is primarily gained from Phase 1 Habitat Surveys and is used to assess the habitat area, distinctiveness and condition, which are used to calculate the value of each habitat.

2.4 Linear habitats require different treatments, utilising lengths rather than areas. Therefore, in accordance with the guidance hedgerows are considered separately.

2.5 Full detail of the calculation methodology is provided by the most recent Warwickshire, Coventry and Solihull impact assessment guidance note1.

istinctiveness

2.6 Habitat parcels and hedgerows are assigned one of six bands on the basis of their distinctiveness (*Table*). Distinctiveness of habitats includes parameters such as species richness, diversity, rarity (at local, regional, national and international scales), and the degree to which a habitat supports rarer species. Hedgerows are assessed in a similar way.

Table 1 abitat istinctiveness

abitat edgero istinctiveness	etric alue
High	6
Medium-High	5
Medium	4
Medium-Low	3
Low	2
None	0

[1] Guide to Warwickshire, Coventry and Solihull Biodiversity Offsetting Biodiversity Impact Assessment Calculator v19.0 (2018) Available at: https://apps.warwickshire.gov.uk/api/documents/WCCC-863-791

Condition

2.7 Assessment of the condition of a habitat requires an agreed set of standards with a prescriptive and repeatable methodology. The Higher Level agri-environment Schemes (HLS) condition assessment tool (Farm Environment Plan (FEP) Manual) has been identified as meeting the requirements of the metric. The condition assessment focuses on habitat condition, with categories spread evenly across the condition spectrum.

2.8 Hedgerow condition is assessed based on eight criteria such as height, width, gap percentage and width of undisturbed margins. Hedgerows have to achieve a minimum standard to 'pass' each criteria and be considered in 'favourable' condition.

2.9 Each condition band for habitats and hedgerows has a numerical value similar to that of the distinctiveness valuation which is shown in *Table* . This provides the second value used in the metric.

Table 2 Condition eighting

abitat Condition	etric alue
Good	3
Moderate	2
Poor	1

etric pplication

2.10 Through the use of these values within the metric and the addition of the area/length data, the value of each habitat and hedgerow can be calculated using the following equation:

Biodiversity units Condition score istinctiveness Score rea(ha) or Length(m)

2.11 The biodiversity units for each habitat type can then be calculated and added together to give a total site habitat biodiversity value, pre-development.

2.12 The new use post-framework is then used to calculate how many hectares of each habitat are being retained, retained and enhanced or lost. Any habitats that are being retained or retained and enhanced within the site are then taken away from the site habitat biodiversity value to give the Habitat Impact Score (HIS).

2.13 When considering linear habitats, the site linear biodiversity value is adjusted to take account of retained or retained and enhanced linear features, giving the Hedge Impact Score.

Species Considerations

2.14 Within the current metric there is no provision for the value associated with protected species. The justification for excluding this factor from the pilot scheme is based around two key points raised by DEFRA in the biodiversity technical paper (2011) and are outlined below:

- One of the key principles driving offsetting is that there will be no change to existing levels of protection for biodiversity. Therefore, existing protection for habitats and species, particularly those covered by the EU Habitats and Species Directive, are not affected by the offsetting pilot;

- It is envisaged that a majority of the species-based issues will be localised in nature, with different species creating issues in different areas. DEFRA aims to avoid designing onerous details that will apply in limited situations, and would require a significant amount of local interpretation.

2.15 The potential of incorporating all notable species in the metric calculations is currently considered to be overly complex and difficult to accurately quantify (potentially leading to over or under calculating the value of certain parcels of land).

2.16 It has been agreed that existing legal processes for protecting species will take precedent and there are mechanisms by which impacts are to be addressed. Further to this, species not covered by specific legislation will be dealt with appropriately through a targeted mitigation approach factored into the habitat creation process.

Compensation

n-site

2.17 In addition to quantifying the biodiversity value of habitats / hedgerows to be lost, to determine the offsetting requirement it is also necessary to measure the offsetting potential of on-site mitigation measures. This allows for the potential quantity of off-site units required to be calculated. For this to take place a number of factors must be considered:

- the size of the mitigation areas;
- the habitat distinctiveness band it is assigned currently, and the target band once improved; and
- the condition of the habitat at the start of the offset project, and its condition at the end.

2.18 The potential compensation value is derived from the difference in quality between the habitat to be lost and that to be created. The area from which the same number of units can be achieved may allow for the area required for mitigation to be smaller than that which is being lost. For example, if a habitat of low distinctiveness and poor condition is improved to create a habitat of high distinctiveness in good condition, the area needed to offset can theoretically be less than that lost.

is ultipliers

2.19 Once the maximum potential value of the mitigation is calculated (the difference between the current value and the proposed value) a set of risk multipliers is utilised to quantify the difference between the area to be lost and the area to be created/enhanced.

2.20 The aim of a multiplier is to correct for a disparity or risk. There are two main types of risk that are associated with habitat creation:

- **elivery ris s** The risks associated with the actual delivery of the offset due to the uncertainty in the effectiveness of restoration and/or habitat creation/management techniques.
- **Spatial ris s** These reflect ecological risks deriving from the change in location of the habitat or resource. For example, it may be that recreating a type of habitat in a new location may reduce its biodiversity value.

2.21 Once there is an estimate of the failure risk, it is possible to work out the necessary multiplier to achieve a suitable level of confidence. The work of *oilanean* (2009) provides a basis for different multipliers of various levels of risk that have been adopted in the trial. *Table* shows the multipliers attached to each risk category.

Table 3 ultipliers for ifferent Categories of elivery is

ifficulty of ecreation estoration	ultiplier
Very High	10
High	3
Medium	1.5
Low	1

Temporal Multiplier

2.22 Through the delivery of offsets, there may be a difference in time between the negative effect on biodiversity and the offset reaching the required quality or level of maturity, resulting in a loss of biodiversity for a period of time. To address the issue of a time-lag, a multiplier is applied. The number of years that time discounting should take into consideration, is from the point of impact to the estimated time that it will take for the habitat to reach the pre-agreed target quality.

2.23 *Table* shows the multipliers associated with each time span; it is proposed that the maximum multiplier used to take account of temporal risk is 3.

Table ultipliers for ifferent Time Periods

ears to Target Condition	ultiplier
3	1.1
5	1.2
10	1.4
15	1.7
20	2.0
25	2.4
30	2.8
32	3

Calculating Biodiversity Units

2.24 Once all factors of distinctiveness, target condition, risk and temporal multipliers have been assigned for each habitat type, the calculation results in a Habitat Mitigation Score (HMS), which is the biodiversity units that the site will provide post-development.

2.25 To calculate the overall net biodiversity loss or gain for the scheme being assessed, which is termed the Habitat Biodiversity Impact Score (HBIS), the pre-development biodiversity units, i.e. the Habitat Impact Score (HIS), is subtracted from the post-development biodiversity units, the Habitat Mitigation Score (HMS). Therefore:

HBIS = HMS – HIS

2.26 Compensation for habitat loss is further affected by trading down corrections. Habitat losses must be compensated for by equivalent or higher distinctiveness habitat. Thus any increase in low distinctiveness habitats cannot be used to compensate for higher value habitat loss. The same philosophy applies with medium-low to medium valued habitats and so forth.

Considerations

2.27 Natural ecological communities are susceptible to change; at times this change can be rapid as a result of internal and external environmental factors. The biodiversity offsetting calculations are based on ecological assessments of habitats carried out during 2019; as a result, changes which may affect the conclusions of this report may occur, if a prolonged period of time elapses prior to the commencement of the project.

The proposed site habitat biodiversity values have been calculated using the proposed masterplan which supports the outline application (12006-1-110 The Harris Partnership November 2019).

2.28 The aim of biodiversity offsetting is to compensate for significant adverse impacts on biodiversity identified after appropriate avoidance, minimisation and on-site rehabilitation measures have been taken, according to the mitigation hierarchy as required by NPPF. Any changes to planning proposals or decisions may affect the credit requirement of the site. As mentioned previously, as the project is currently at outline, all the specific details of the design are yet to be determined and will not be available until the project progresses to full planning; therefore some changes are likely to the framework and GI provision, meaning that the calculations will need to be reassessed. Thus, all scores within this assessment are indicative, and should be treated as such.

2.29 FPCR has used the Warwickshire metric, which takes into account habitats that are more indicative to that region. This means that the values given to a habitat type in this instance are based on the rarity of those habitats within Warwickshire. This means that the score achieved is not necessarily reflect accurately to the habitats value within South Yorkshire; but as it stands provides an indicative assessment.

3.0 RESULTS

Biodiversity Units – Existing Value

abitats

3.1 The existing Phase 1 Habitats are show in Figure 1.

3.2 The biodiversity units for each habitat on the site have been calculated and are presented in *Table* Justifications for condition scores are detailed below.

Table Biodiversity nits E isting n-Site abitats

abitat	rea (ha)	Condition	Biodiversity nits
Built Environment: Buildings/hardstanding	0.82	Poor	0
Grassland: Improved grassland	16.6	Poor	33.2
Grassland: Poor semi-improved grassland	4.14	Poor	12.42
Other: Bare ground	0.76	Poor	1.52
Wetland: Standing water	0.02	Good	0.36
Woodland: Broad-leaved semi-natural woodland	0.01	Moderate	0.12
Woodland: Dense continuous scrub	0.42	Poor	1.26
Woodland: Mixed plantation	14.85	Poor	29.7
Woodland: Scattered scrub	0.42	Poor	1.68
Woodland: Scattered scrub	0.64	Moderate	5.12
Total	**3 .7**	**-**	85.38

Please note, the figures in the above table are taken from the matrix tables (provided in Appendix A) which use up to six decimal places to calculate the number of biodiversity units. As a result, there may be minor discrepancies (rounding errors) between the columns and the totals; however, the numbers duplicate those presented within the matrix calculator.

Non-assessed habitats

3.3 The following habitat types are always classed as poor condition within the Warwickshire, Coventry and Solihull metric:

- Built Environment: Buildings/hardstanding

- Grassland: Improved grassland
- Grassland: Poor semi-improved grassland
- Other: Bare ground

Wetland: Standing water

3.4 This habitat type was classified as being in good condition based on meeting all of the criteria set out in the FEP manual WO7 condition assessment. These were:

- It is set within a semi-natural habitat
- It is within 500m of another wetland feature
- There were no obvious signs of pollution
- There was no evidence of damaging non-native species
- There was no evidence of the pond being stocked with fish, or supporting large number of wildfowl
- Water levels appeared to fluctuate naturally

Woodland: Broad-leaved semi-natural woodland

3.5 This habitat type was classified as being in moderate condition based on meeting four of the five criteria set out in the FEP manual T08 condition assessment. These were:

- It was native species dominant
- There was a diverse age and height structure
- It was free from damage from stock and wild animals
- The areas was protected from agricultural operations

3.6 The area of woodland assessed did not contain standing and fallen dead trees over 20cm in diameter.

Woodland: Dense continuous scrub

3.7 This habitat type was classified as being in poor condition based on meeting three of the five criteria set out in the FEP manual V05 condition assessment. These were:

- There were at least 3 woody species present
- Pernicious weeds and invasive species made up less than 5% of the ground cover
- The scrub had a border of ungrazed tall herbs

3.8 The section of dense scrub was not diverse in terms of age structure and did not contain clearings and glades.

Woodland: Mixed plantation

3.9 This habitat type was classified as being in poor condition based on meeting three of the five criteria set out in the FEP manual T08 condition assessment. These were:

- It was native species dominant

- It was free from damage from stock and wild animals
- The areas was protected from agricultural operations

3.10 The plantation woodland did not contain a diverse age and height structure or standing and fallen dead trees over 20cm in diameter.

Woodland: Scattered scrub

3.11 This habitat type was classified using the criteria set out in the FEP manual V05 condition assessment. The areas within the north of the site and within the plantation woodlands were classified as being in poor condition, whilst the area in the southwest of the site was in moderate condition.

3.12 All the scattered scrub met the following criteria:

- There were at least 3 woody species present
- Pernicious weeds and invasive species made up less than 5% of the ground cover

3.13 The scattered scrub areas that scored moderately also met the following criteria:

- The scrub had a border of ungrazed tall herbs
- There were clearings and glades within the scrub

3.14 None of the scattered scrub was diverse in terms of age structure.

edgero s

3.15 The biodiversity units for each hedgerow on the site have been calculated and are presented in *Table* .

Table Biodiversity nits E isting n-Site edgero s

abitat	Length (m)	Condition	Biodiversity nits
H1 Hedges: species rich hedge	0.21	2	1.68
H2 Hedges: species rich hedge	0.33	2	2.64
H3 Hedges: species rich hedge	0.145	2	1.2
H4 Hedges: species rich hedge	0.163	2	1.28
H5 Hedges: species rich hedge	0.087	2	0.72
H6 Hedges: species rich hedge	0.351	2	2.8
H7 Hedges: species rich hedge	0.054	2	0.4

H8 Hedges: species rich hedge	0.128	2	1.04
H9 Hedges: species rich hedge	0.315	2	2.56
H11 Hedges: species rich hedge	0.201	2	1.6
H12 Hedges: species rich hedge	0.243	2	1.92
H13 Hedges: species rich hedge	0.139	2	1.12
Total	**2.37**	**-**	**1 .9**

Please note, the figures in the above table are taken from the matrix tables (provided in *Appendi A*) which use up to six decimal places to calculate the number of biodiversity units. As a result, there may be minor discrepancies (rounding errors) between the columns and the totals, however, the numbers duplicate those presented within the matrix calculator.

3.16 All of the hedgerows were considered species native species rich with more than five native woody species recorded per 30m section.

3.17 Condition assessments were uniform across the hedgerows which met 6 conditions and failed 2. Those that were met were:

- A1 Hedgerow is on average above 1.5m high.
- A2 Hedgerow is on average over 1.5m wide.
- B1 Gaps between the ground and the base of the canopy are below 0.5m for over 90% of length (excluding lines of trees).
- B2 Horizontal gaps make up less that 10% of the hedgerow and canopy gaps do not exceed 5m.
- D1 over 90% of hedgerow and undisturbed ground is free of invasive, non-native and neophyte species.
- D2 Over 90% of the hedgerow and undisturbed ground is free of damage caused by human activities.

3.18 The conditions that all hedgerows failed are:

- C1 Over 90% of the hedgerow must hold a width of over 1m undisturbed ground on at least one side containing perennial herbaceous vegetation.
- C2 Plant species indicative of nutrient enrichment of soils dominate less than 20% of ground cover i.e. nettles (*ticia spp*) and docks (*ume spp*).

Habitat Creation

abitats

3.19 Proposed habitats are show in Figure 3.

3.20 The following section outlines the habitats to be created and restored and provides evidence for the scores they receive within the metric.

3.21 The proposed onsite mitigation and their target conditions are presented in *Table*

Table 7 Biodiversity nits Proposed Created and Enhanced n-site abitats and Target Conditions

Proposed abitat	rea (ha)	Target Condition	Biodiversity nits
Grassland: Amenity Grassland (Created)	0.77	Poor	1.4
Built Environment: Hardstanding (Created)	11.96	Poor	0
Built Environment: Buildings (Created)	9.05	Poor	0
Woodland: Scattered Trees (Created)	0.4	Poor	1.33
Woodland: Broad-leaved Plantation (Created)	7.35	Moderate	19.6
Woodland: Scattered Scrub (Created)	6.25	Good	44.12
Wetland: Standing Water (Created)	1.03	Moderate	6.87
Wetland: Reedbed (Created)	0.57	Good	8.55
Grassland: Semi-improved Neutral Grassland (Enhanced)	0.28	Good	0.8
Total	**37.**		82.67

Please note, the figures in the above table are taken from the matrix tables (provided in Appendix A) which use up to six decimal places to calculate the number of biodiversity units. As a result, there may be minor discrepancies (rounding errors) between the columns and the totals; however, the numbers duplicate those presented within the matrix calculator

Non-assessed habitats

3.22 The following habitat types are always classed as poor condition within the Warwickshire, Coventry and Solihull metric:

- Built Environment: Buildings/hardstanding
- Grassland: Amenity grassland

Woodland: Broad-leaved plantation

3.23 The target condition for this habitat is moderate. It is considered that with appropriate management this condition can be achieved in 20 years. In order to meet the moderate target, it

must meet four out of the five condition assessments set out in the FEP manual T08 condition below:

- Native species are dominant, making up more than 90% of vegetation cover.
- Diverse are and height structure
- Free from damage (in the last five years) from stock or wild mammals, there should be evidence of regeneration i.e. saplings.
- Standing and fallen deadwood of over 20cm in diameter are present.
- The area is protected from damage by agricultural and other adjacent operations.

Woodland: Scattered scrub

3.24 This habitat is targeted to reach a good condition within 15 years as per the guidance for the Warwickshire, Coventry and Solihull metric. The scrub must be suitably managed to achieve a variety in age and structure (i.e. rotational cutting). To achieve good condition the habitat must meet all five of the following criteria from the FEP manual V05 condition:

- Must contain at least three woody species with no one species comprising over 75% of cover.
- Varied age range including a mixture of seedlings, saplings, young shrubs and mature shrubs.
- Pernicious weeds and invasive species make up less than 5% of ground cover.
- The scrub contains a well-developed edge including ungrazed tall herbs.
- Contains a number of clearing and glades.

Wetland: Standing water

3.25 The target habitat condition for this area is moderate within a 5 year time frame. Due to the rapid rate water vegetation, invertebrates and amphibians colonise at, ponds can quickly reach a level of high wildlife potential however work must be done to ensure water quality is not damaged by factors such as pollution run off. To reach the target condition of moderate it must meet 5 out of the 6 condition assessments from FEP manual W07 condition discussed below:

- The pond should be set within a semi-natural habitat.
- It should be within 500m of another wetland feature i.e. another pond.
- There should be no obvious pollution or inappropriate quality of water supply.
- No damaging non-native plants or animal species. Damaging plants include floating pennywort (*Hydrocotyle ranunculoides* and Japanese knotweed (*eynoutria japonica* . Damaging animals include signal crayfish (*Pacifastacus leniusculus*) and non-native reptiles and amphibians.
- The pond should not host fish or damaging numbers of wildfowl.
- It should only experience natural fluctuations in water levels.

Standing water: reedbed

3.26 This habitat is targeted to reach a good condition within 5 years. The RSPB state that as reeds are fast growing they can successfully establish in a short timeframe. They usually require a large amount of management originally in order to reach a high value however, as the proposed habitat

is a small area, reaching target condition within 5 years is feasible. In order to classify as good it must meet all four criteria from FEP manual W08 condition listed below:

- Scrub cover within the reedbed should be less than 10%.
- Vegetation should be at least 60% reeds.
- Surface water to be present over at least part of the reed bed for the majority of the year.
- Cover of undesirable species to be less than 10%.

Woodland: Scattered trees

3.27 Target habitat condition for is set to be poor within 5 years. The expectation for this habitat is for planted trees over amenity grassland with canopy cover remaining below 30% of these areas. Scattered trees as a habitat does not possess any specific criteria to meet target conditions as it is entirely dependent on the species, age and location of the habitat. Species such as oak, birch, hawthorn and willow are seen as the most ecologically valuable however it takes many decades for ecologically important features such as ivy cover and loose bark to develop.

Enhanced abitats

Grassland: Semi-improved neutral grassland

3.28 There is a section of semi-improved neutral grassland to the south-west of the site that is to be retained and enhanced (Figure 2). Historically the section of land was grassland however, its quality has been reduced through scrub encroachment.

3.29 The habitat is therefore targeted to return to a good condition within a 10 year time frame through scrub removal and ongoing management. The time scale was selected based on the guidance for the Warwickshire, Coventry and Solihull metric. To achieve this, it must meet general grassland conditions detailed within the FEP manual and reach four out of five of the criteria from G06 condition discussed below:

- Undesirable species i.e. creeping thistle (*Cirsium arvense*), common ragwort (*acobaea vulgaris*) and bracken (*Pteridium a uilnum*) make up less than 5% of cover.
- Cover of wildflowers and sedges (excluding undesirable species, creeping buttercup and white clover) cover more than 20% of ground.
- Bare ground makes up less than 10% of cover.
- Invasive trees and shrubs make up less than 5% of cover and indicators of water logging i.e. large sedges and reeds is less than 30%.
- At least two indicator species are frequent and two are occasional i.e. orchids (*rchidaceae*), ox-eye daisy (*eucanthemum vulgare*), yellow rattle (*hinsnthus minor*) etc.

edgero Creation

3.30 5 new hedgerows are proposed as part of the new habitat creation, the length and target conditions of which are presented below in *Table*

Table Biodiversity nits Proposed n-Site edgero s ith Target Conditions

abitat	Length (m)	Target Condition	Biodiversity nits
NH1 Hedges: species rich hedge	0.39	2	2.60
NH2 Hedges: species rich hedge	0.34	2	2.27
NH3 Hedges: species rich hedge	0.40	2	2.67
NH4 Hedges: species rich hedge	0.76	2	5.06
NH5 Hedges: species rich hedge	0.65	2	4.33
Total	**2.**	**-**	**1 .93**

Please note, the figures in the above table are taken from the matrix tables (provided in *Appendi A*) which use up to six decimal places to calculate the number of biodiversity units. As a result, there may be minor discrepancies (rounding errors) between the columns and the totals, however, the numbers duplicate those presented within the matrix calculator.

3.31 Condition assessments of the proposed hedgerows are expected to match those of existing hedgerows on site, meeting the same 6 conditions and failing C1 and C2, reaching a target condition of 2 within a time frame of 5 years. See section 3.16 for specific condition assessments.

4.0 CONCLUSION

4.1 Biodiversity offsetting has been used to inform the habitat creation and enhancement proposals for the scheme. The assessment cannot be concluded as an absolute, as all calculation were based on an indicative framework, due the application only being at an outline stage. Further reassessment will be required at the Reserve Matters stage when a detailed layout has been confirmed. This will result in some changes to the offsetting calculations reported in this initial assessment; however, the principals of the indicative framework plan will be followed for future applications.

4.2 The results of the assessment demonstrate that the outline scheme currently will lead to the delivery of a total net gain in biodiversity for habitats and linear features.

4.3 The whole development area is valued at 85.38 units for habitats and 18.88 units for linear features. Taking into account habitat retention, the proposed development impacts are 78.68 units for habitats and 16.56 units for linear features.

4.4 The creation of new areas of high-quality habitat and the enhancement of retained habitats, results in a delivery of 82.67 units, meaning that there is a net gain in biodiversity of +3.99 units.

4.5 The creation of new hedgerows results in a delivery of 17.92 units, providing a net gain in biodiversity of +1.36 units.

4.6 In order to ensure that the benefits of the proposed habitat creation are maximised it is recommended that a Biodiversity Management Plan be produced detailing long-term management of the site.

ppendi Biodiversity mpact ssessment Calculator Sheets

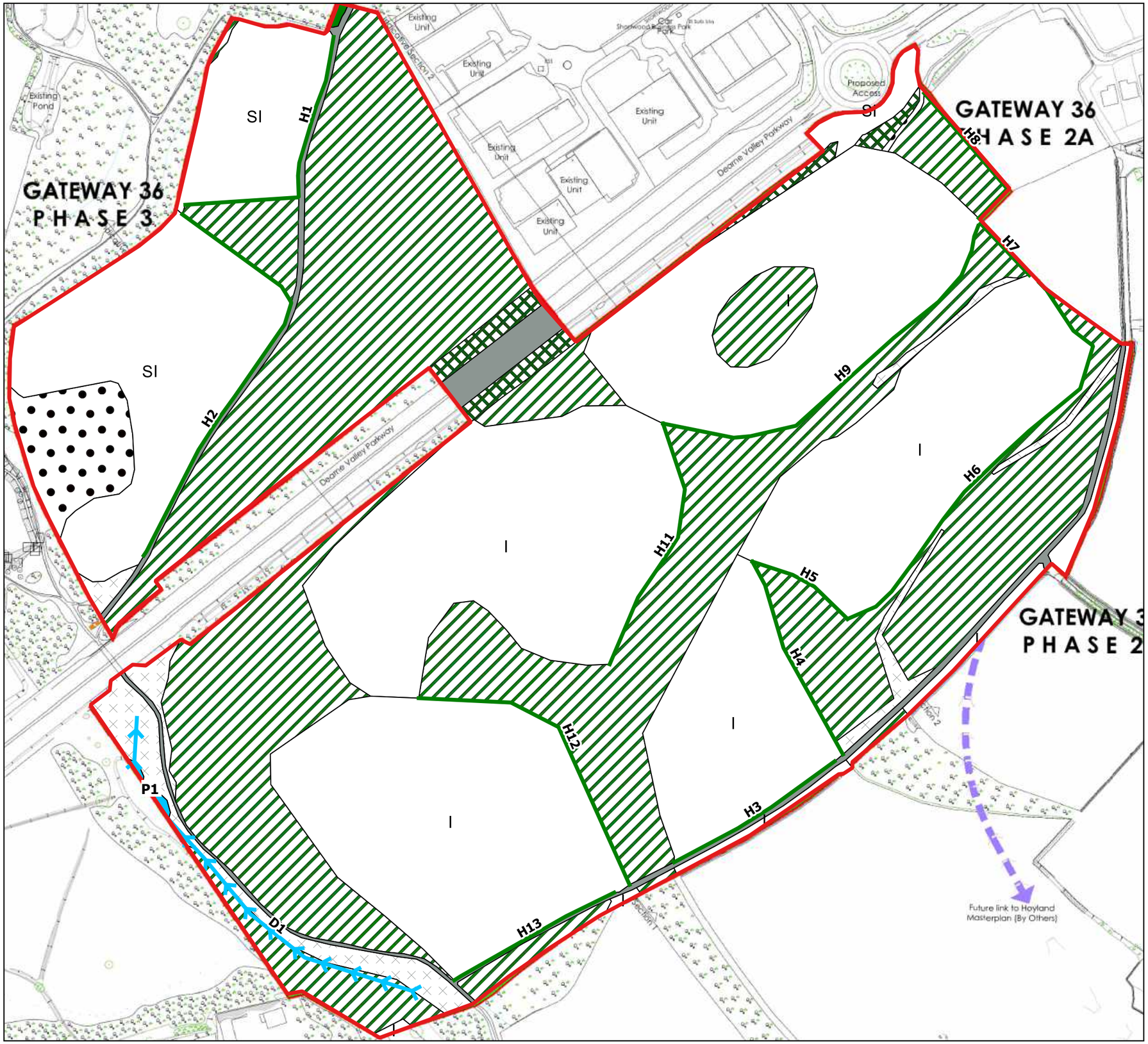
E isting habitats on site Please enter all habitats within the site boundary			abitat distinctiveness		abitat condition		abitat Biodiversity alue abitats to be retained ith no change ithin development		abitats to be retained and enhanced ithin development		abitats to be lost ithin development		
code	Phase 1 habitat description	*Habitat area ha*	*istinctiveness*	*Score*	*Condition*	*Score*	*Area ha*	*E isting value*	*Area ha*	*E isting value*	*Area ha*	*E isting value*	***Comment***
	irect mpacts and retained habitats			A		B	C	A x B x C = D	E	A x B x E = F	G	A x B x G = H	
J4	Other: Bare ground	0.76	Low	2	Poor	1					0.76	**1. 2**	
A21	Woodland: Dense continuous scrub	0.42	Medium-Low	3	Poor	1					0.42	**1.2**	
n/a	Built Environment: Buildings/hardstanding	0.82	none	0	Poor	1	0.10	0.00			0.72	**.**	
B4	Grassland: Improved grassland	16.60	Low	2	Poor	1	0.02	0.04			16.58	**33.1**	
A132	Woodland: Mixed plantation	14.85	Low	2	Poor	1	0.53	1.06			14.32	**2 .**	
A22	Woodland: Scattered scrub	0.42	Medium	4	Poor	1					0.42	**1.**	Patches throughout site
B6	Grassland: Poor semi-improved grassland	4.14	Medium-Low	3	Poor	1					4.14	**12. 2**	
G1	Wetland: Standing water	0.02	High	6	Good	3	0.02	0.36					
A22	Woodland: Scattered scrub	0.64	Medium	4	Moderate	2	0.36	2.88	0.28	2.24			Area by pond P1
A111	Woodland: Broad-leaved semi-natural woodland	0.01	High	6	Moderate	2	0.01	0.12					
n/a	Built Environment: Buildings/hardstanding	0.02	none	0	Poor	1					0.02	**.**	Calculation Rounding Error
	Total	38.70				Total	1.04	4.46	0.28	2.24	37.38	78.68	J
												∑D + ∑F + ∑H	
										Site habitat biodiversity value		85.38	

	Proposed habitats on site (nsite mitigation)			Target habitats distinctiveness		Target habitat condition			Time till target condition		ifficulty of creation restoration		Habitat biodiversity value	
T. Note	code	Phase 1 habitat description	Area ha	istinctiveness	Score	Condition	Score		Time years	Score	ifficulty	Score		Comment
		abitat Creation	N		O		P			Q		R	(N x O x P) / Q / R	
	J12	Grassland: Amenity grassland	0.77	Low	2	Poor	1		3 Years	1.1	Low	1	**1.**	
	n/a	Built Environment: Buildings/hardstanding	9.05	none	0	Poor	1		3 Years	1.1	Low	1	**.**	Buildings
	n/a	Built Environment: Buildings/hardstanding	11.96	none	0	Poor	1		3 Years	1.1	Low	1	**.**	Hardstanding
	A112	Woodland: Broad-leaved plantation	7.35	Medium	4	Moderate	2		20 years	2	Medium	1.5	**19.**	
	A22	Woodland: Scattered scrub	6.25	Medium	4	Good	3		15 years	1.7	Low	1	**.12**	
	A3	Woodland: Scattered trees	0.40	Medium	4	Poor	1		5 years	1.2	Low	1	**1.33**	
	B51	Wetland: Reedbed	0.57	High	6	Good	3		5 years	1.2	low	1	**.**	
	G1	Wetland: Standing water	1.03	High	6	Moderate	2		5 years	1.2	Medium	1.5	**. 7**	
		Total	**37.3**											
		abitat Enhancement						Existing value S (= F)					((NxOxP)-S)/Q/R	
B	B22	Grassland: Semi-improved neutral grassland	0.28	Medium	4	Good	3	**2.2**	10 years	1.4	Low	1	**.**	
		Total	**.2**								Trading down correction value		0.00	
										abitat itigation Score (S)			**2. 7**	
													HBIS = HMS - HIS	
										abitat Biodiversity mpact Score			**3.99**	Gain
										Percentage of biodiversity impact loss				

	Loss	Gain	Impact
Woodland Habitat	31.58	65.05	**33. 7**
Grassland Habitat	45.58	2.20	**- 3.3**
Wetland Habitat	0.00	15.42	**1 . 2**
Other Habitat (including Built Environment)	1.52	0.00	**-1. 2**
Total	78.68	82.67	**3.99**
		Trading down	**.**
			3.99

	E isting edgero features on site			edgero distinctiveness		edgero condition assessments									edgero features to be retained ith no change ithin development		edgero features to be retained and enhanced ithin development		edgero features to be lost ithin development	
T. Note	code	Hedgerow habitat description	*Feature length m*	*istinctiveness*	*Score*	*A*	*A*			*C*	*C*			***Condition Score***	*ength m*	*E isting value*	*ength m*	*E isting value*	*ength m*	*E isting value*
		irect mpacts and retained features			A										C	A x B x C = D	E	A x B x E = F	G	A x B x G = H
1	n/a	Hedges: species rich hedge	0.21	Medium	4	Pass	Pass	Pass	Pass	Fail	Fail	Pass	Pass	2					**.21**	**1.**
2	n/a	Hedges: species rich hedge	0.33	Medium	4	Pass	Pass	Pass	Pass	Fail	Fail	Pass	Pass	2					**.33**	**2.**
3	n/a	Hedges: species rich hedge	0.15	Medium	4	Pass	Pass	Pass	Pass	Fail	Fail	Pass	Pass	2	0.15	**1.2**				
4	n/a	Hedges: species rich hedge	0.16	Medium	4	Pass	Pass	Pass	Pass	Fail	Fail	Pass	Pass	2					**.1**	**1.2**
5	n/a	Hedges: species rich hedge	0.09	Medium	4	Pass	Pass	Pass	Pass	Fail	Fail	Pass	Pass	2					**. 9**	**.72**
6	n/a	Hedges: species rich hedge	0.35	Medium	4	Pass	Pass	Pass	Pass	Fail	Fail	Pass	Pass	2					**.3**	**2.**
7	n/a	Hedges: species rich hedge	0.05	Medium	4	Pass	Pass	Pass	Pass	Fail	Fail	Pass	Pass	2					**.**	**.**
8	n/a	Hedges: species rich hedge	0.13	Medium	4	Pass	Pass	Pass	Pass	Fail	Fail	Pass	Pass	2					**.13**	**1.**
9	n/a	Hedges: species rich hedge	0.31	Medium	4	Pass	Pass	Pass	Pass	Fail	Fail	Pass	Pass	2					**.31**	**2.**
11	n/a	Hedges: species rich hedge	0.20	Medium	4	Pass	Pass	Pass	Pass	Fail	Fail	Pass	Pass	2					**.2**	**1.**
12	n/a	Hedges: species rich hedge	0.24	Medium	4	Pass	Pass	Pass	Pass	Fail	Fail	Pass	Pass	2					**.2**	**1.92**
13	n/a	Hedges: species rich hedge	0.14	Medium	4	Pass	Pass	Pass	Pass	Fail	Fail	Pass	Pass	2	0.14	**1.12**				
		Total	2.36											Totals	0.29	2.32	0.00	0.00	2.07	16.56
																				∑D + ∑F + ∑H
																		Site Hedge Biodiversity Value		18.88

	Proposed hedge features on site (nsite mitigation)			Target hedge distinctiveness		edgero condition assessments										Time till target condition		ifficulty of creation restoration		
T. Note	code	Phase 1 habitat description	*ength m*	*istinctiveness*	*Score*	*A*	*A*			*C*	*C*			*Condition Score*		*Time years*	*Score*	*ifficulty*	*Score*	***Linear biodiversity value***
		edgero Creation	N		O												Q		R	(N x O x P) / Q / R
NH 1	n/a	Hedges: species rich hedge	0.39	Medium	4	Pass	Pass	Pass	Pass	Fail	Fail	Pass	Pass	2		5 years	1.2	Low	1	**2.**
NH 2	n/a	Hedges: species rich hedge	0.35	Medium	4	Pass	Pass	Pass	Pass	Fail	Fail	Pass	Pass	2		5 years	1.2	Low	1	**2.33**
NH 3	n/a	Hedges: species rich hedge	0.70	Medium	4	Pass	Pass	Pass	Pass	Fail	Fail	Pass	Pass	2		5 years	1.2	Low	1	**. 7**
NH 4	n/a	Hedges: species rich hedge	0.59	Medium	4	Pass	Pass	Pass	Pass	Fail	Fail	Pass	Pass	2		5 years	1.2	Low	1	**3.93**
NH 5	n/a	Hedges: species rich hedge	0.05	Medium	4	Pass	Pass	Pass	Pass	Fail	Fail	Pass	Pass	2		5 years	1.2	Low	1	**.33**
NH 6	n/a	Hedges: species rich hedge	0.26	Medium	4	Pass	Pass	Pass	Pass	Fail	Fail	Pass	Pass	2		5 years	1.2	Low	1	**1.73**
NH 7	n/a	Hedges: species rich hedge	0.35	Medium	4	Pass	Pass	Pass	Pass	Fail	Fail	Pass	Pass	2		5 years	1.2	Low	1	**2.33**
		Total	**2. 9**																	
		edgero Enhancement													Existing value S (= F)					((N x O x P) - S) / Q / R
																		Trading down correction value		0.00
		Total	.															**edge itigation Score (S)**		**17.92**
																			HBIS = HMS - HBIS	
																		edge Biodiversity mpact Score	**1.3**	Gain



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Key

- Site Boundary
- Bare ground
- Broadleaved woodland - plantation
- Broadleaved woodland - semi-natural
- Built Environment: Buildings/hardstanding
- I Improved grassland
- SI Poor semi-improved grassland
- Scrub - dense/continuous
- Scrub - scattered
- Standing water
- Running water
- Intact hedge - species-poor

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0 50 100 150 200 m

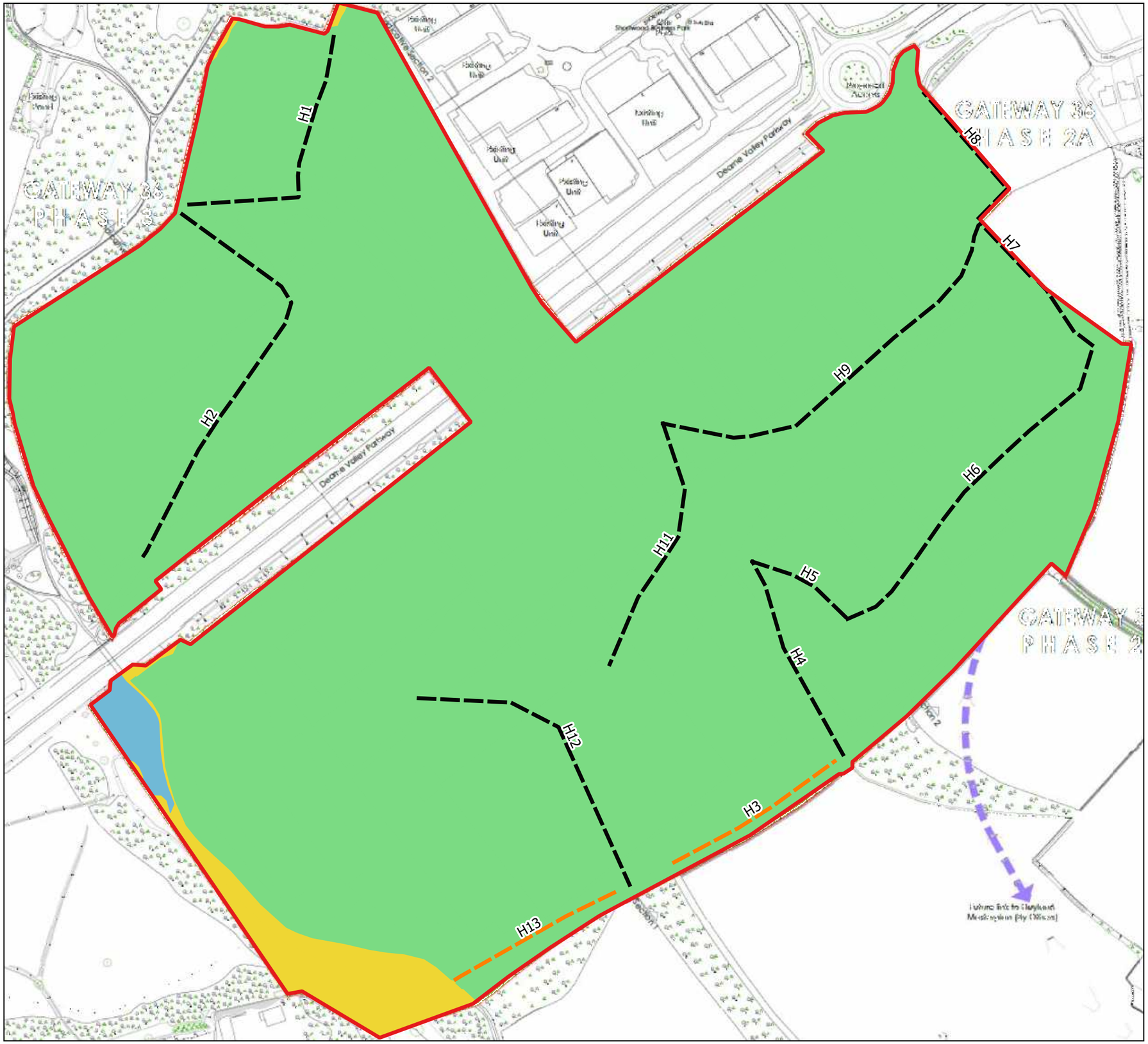
client
Harworth Group

project
Dearne Valley Parkway, Rockingham, Barnsley - Phases 2 and 3

drawing title
PHASE 1 HABITAT PLAN

scale @ A3: 1:3000
drawn: JDH
issue: 28/1/2020
drawing / figure number: **Figure 1**
rev: **6424**

J:\6400\6424\QGIS 2.14 NEW\Plans\Phase 1 plans



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Key

Site Boundary

Habitats

- Habitats
- Retained
- Retained for Restoration

Hedgerows

- Lost
- Retained

client
Harworth Group

project
Dearne Valley Parkway, Rockingham, Barnsley - Phases 2 and 3

drawing title
HABITAT RETENTION PLAN

scale @ A3: 1:3000
drawn: JDH
issue: 28/1/2020
drawing / figure number: **Figure 2**
rev: -

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Key

- Site Boundary
- Broadleaved Woodland
- Building
- Hardstanding
- Scattered Trees
- SI grassland
- Standing Water
- Amenity
- Reedbed
- Scattered Scrub
- Plantation
- Improved Grassland
- New Hedgerows (NH)
- Retained Hedgerows (H)

client
Harworth Group

project
Dearne Valley Parkway, Rockingham, Barnsley - Phases 2 and 3

drawing title
HABITAT CREATION PLAN

scale @ A3	drawn	issue
1:3000	JDH	28/1/2020

drawing / figure number
Figure 3

rev
-

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0 50 100 150 200 m

J:\6400\6424\QGIS 2.14 NEW\Plans\Phase 1 plans

Biodiversity Impact Assessment Summary

Warwickshire County Council

Derived Locally from the Defra Metric
Version 19.0 (01/04/2018)

Site name **to be copied from the B sheet**
Planning reference number **to be copied from the B sheet**

E isting	abitat rea (ha)	edgero impact (m)	Connectivity eatures (m)	abitat Biodiversity alue	edgero Biodiversity alue	Connectivity Biodiversity alue
Onsite Biodiversity Impact	37.38	2.07	0.00	85.38	18.88	0.00
Indirect Biodiversity Impact	0.00	0.00	0.00	0.00	0.00	0.00
Total habitat linear features impacted	**37.3**	**2. 7**	**.**	**.3**	**1 .**	**.**
etained Created Enhanced						
Onsite biodiversity retained	1.04	0.29	0.00	4.46	0.00	0.00
Onsite Creation	37.38	2.69	0.00	81.87	17.92	0.00
Biodiversity retained and enhanced	0.28	0.00	0.00	3.04	0.00	0.00
Total biodiversity retained enhanced	**3 .7**	**2.9**	**.**	**9.37**	**17.92**	**.**
Trading o n	n/a	n/a	n/a	0.00	0.00	0.00
Biodiversity mpact	**n a**	**n a**	**n a**	**3.99**	**1.3**	**.**

abitat mpacts	Loss	Gain	Impact	%age losses	Compensatory Unit loss	Indicative Offset (ha)	WCC Offset units	WCC Indicative Offset Contribution
Woodland Habitat	31.58	65.05	33. 7					
Grassland Habitat	45.58	2.20	- 3.3					
Wetland Habitat	0.00	15.42	1 . 2					
Other Habitat (incl. Built Env)	1.52	0.00	-1. 2			Transferred to Wetland		
Total	78.68	82.67	3.99	0.00	0.00	0.00	0.00	
		Trading down	.					
			3.99					

Warwickshire County Council is currently transferring 'Other' habitat loss to Wetland Creation

edgero mpacts	Loss	Gain	Trading down	Impact	Unit loss	Indicative Offset (km)	WCC Offset units	WCC Offset Contribution
Hedgerow	16.56	17.92		1.3				

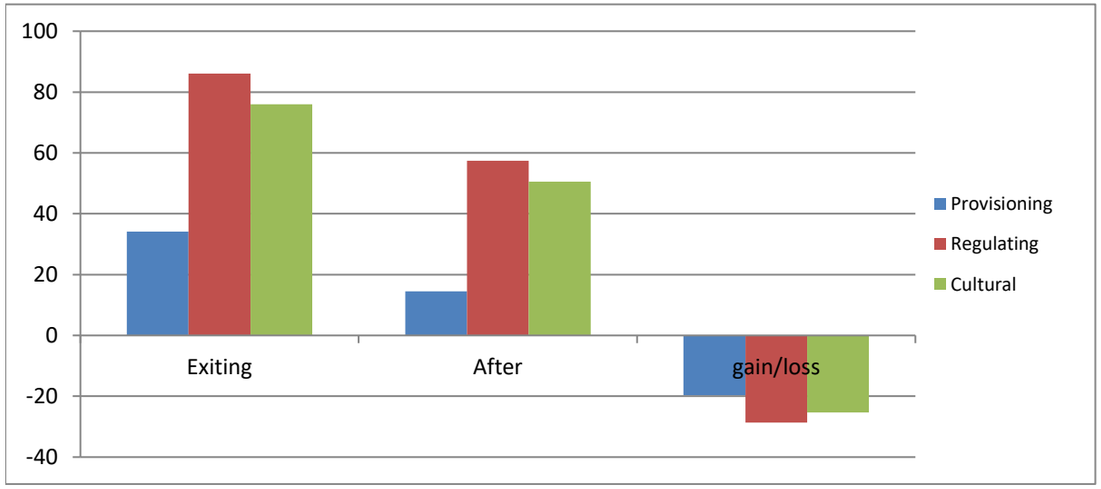
S

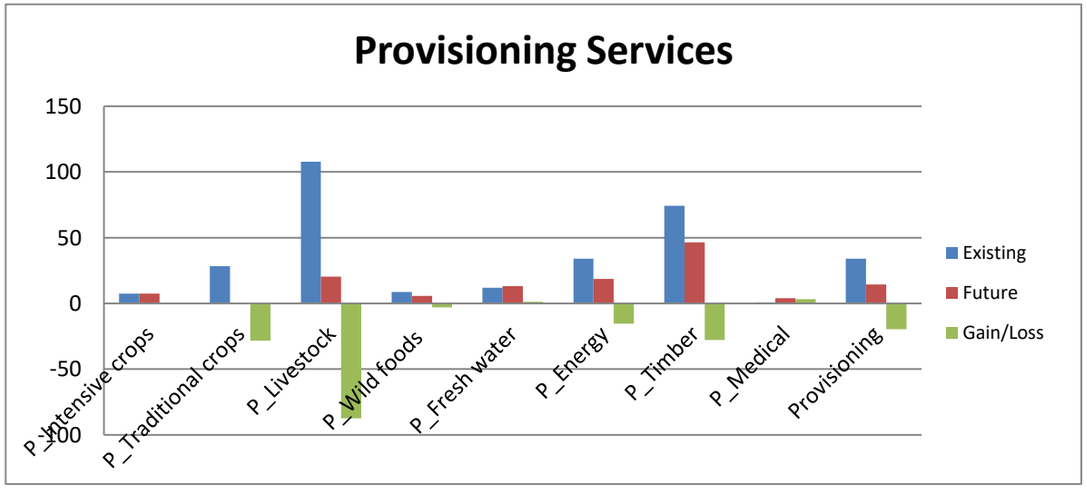
This development will result in 3.99 Habitat Biodiversity Units gain; 1.36 Hedgerow Units gain and 0 Connectivity Biodivesity Units loss

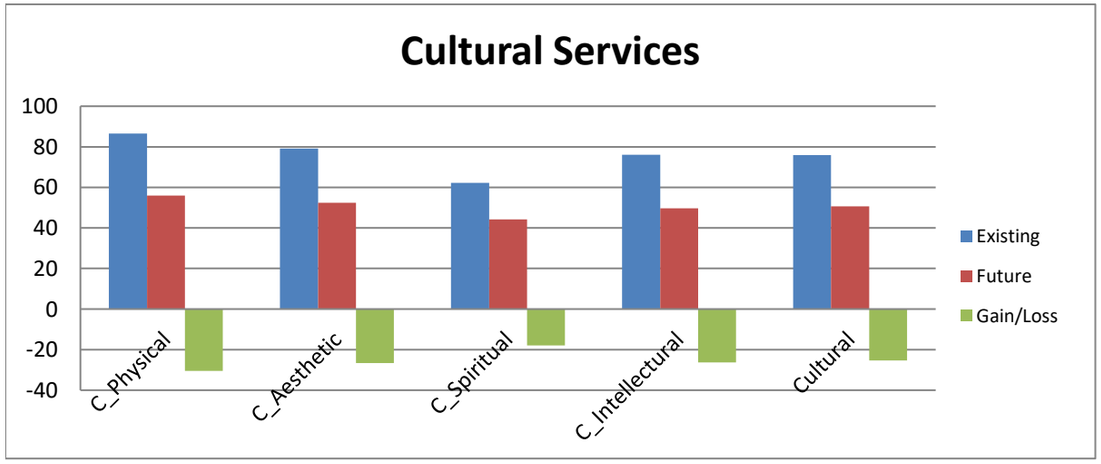
EC S STE SE CES N L S S

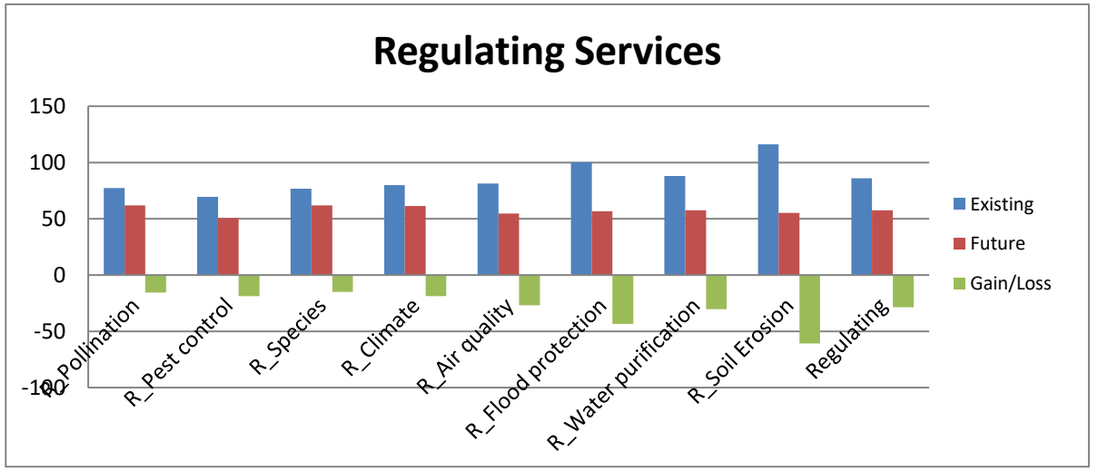
Biodiversity Impact Assessment Summary

Derived Locally from the Defra Metric
Version 19.0 (01/04/2018)









For any questions with regard to biodiversity impact and this development please contact Warwickshire County Council Ecological Services:
email: planningecology@warwickshire.gov.uk or telephone 01926 418060

Derived Locally from the Defra Metric
Version 19.0 (01/04/2018)

ar ic shire, Coventry Solihull - abitat mpact ssessment Calculator

KEY	
	No action required
	Enter value
	Drop-down menu
	Calculation
	Automatic lookup
	Automatic Condition setting
	esult

Local Planning uthority	
Site name	
Planning application reference number	
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Please fill in both tables
Please do not edit the formulae or structure
To condense the form for display hide vacant rows, do not delete them
If additional rows are required, or to provide feedback on the calculator please contact WCC Ecological Services 01926 418060

		E isting habitats on site Please enter all habitats within the site boundary		**abitat distinctiveness**		**abitat condition**		**abitat Biodiversity alue** abitats to be retained ith no change ithin development		abitats to be retained and enhanced ithin development		abitats to be lost ithin development		
T. Note	code	Phase 1 habitat description	*Habitat area ha*	*istinctiveness*	*Score*	*Condition*	*Score*	*Area ha*	*E isting value*	*Area ha*	*E isting value*	*Area ha*	*E isting value*	***Comment***
		irect mpacts and retained habitats			A		B	C	A x B x C = D	E	A x B x E = F	G	A x B x G = H	
B	J4	Other: Bare ground	0.76	Low	2	Poor	1					0.76	**1. 2**	
	A21	Woodland: Dense continuous scrub	0.42	Medium-Low	3	Poor	1					0.42	**1.2**	
	n/a	Built Environment: Buildings/hardstanding	0.82	none	0	Poor	1	0.10	0.00			0.72	**.**	
	B4	Grassland: Improved grassland	16.60	Low	2	Poor	1	0.02	0.04			16.58	**33.1**	
	A132	Woodland: Mixed plantation	14.85	Low	2	Poor	1	0.53	1.06			14.32	**2 .**	
	A22	Woodland: Scattered scrub	0.42	Medium	4	Poor	1					0.42	**1.**	Patches throughout site
	B6	Grassland: Poor semi-improved grassland	4.14	Medium-Low	3	Poor	1					4.14	**12. 2**	
	G1	Wetland: Standing water	0.02	High	6	Good	3	0.02	0.36					
	A22	Woodland: Scattered scrub	0.64	Medium	4	Moderate	2	0.36	2.88	0.28	2.24			Area by pond P1
	A111	Woodland: Broad-leaved semi-natural woodland	0.01	High	6	Moderate	2	0.01	0.12					
	n/a	Built Environment: Buildings/hardstanding	0.02	none	0	Poor	1					0.02	**.**	Calculation Rounding Error
		Total	38.70				Total	1.04	4.46	0.28	2.24	37.38	78.68 J	
													∑D + ∑F + ∑H	
											Site habitat biodiversity value		85.38	

Before/after impact	**ndirect Negative mpacts** Including off site habitats	K	Value of loss from indirect impacts K x A x B = Li, Lii	Li - Lii
Before				
After				
Before				
After				
Before				
After				
Before				
After				
Before				
After				
	Total	0.00		0.00 M

	HIS = J + M
abitat mpact Score (S)	**7 .**

Biodiversity Impact Assessment Summary

Derived Locally from the Defra Metric
Version 19.0 (01/04/2018)

		Proposed habitats on site (nsite mitigation)		Target habitats distinctiveness		Target habitat condition			Time till target condition		ifficulty of creation restoration		*Habitat biodiversity value*	
T. Note	code	Phase 1 habitat description	*Area ha*	*istinctiveness*	*Score*	*Condition*	*Score*		*Time years*	*Score*	*ifficulty*	*Score*		***Comment***
		abitat Creation	N		O		P			Q		R	(N x O x P) / Q / R	
	J12	Grassland: Amenity grassland	0.77	Low	2	Poor	1		3 Years	1.1	Low	1	**1.**	
	n/a	Built Environment: Buildings/hardstanding	9.05	none	0	Poor	1		3 Years	1.1	Low	1	**.**	Buildings
	n/a	Built Environment: Buildings/hardstanding	11.96	none	0	Poor	1		3 Years	1.1	Low	1	**.**	Hardstanding
	A112	Woodland: Broad-leaved plantation	7.35	Medium	4	Moderate	2		20 years	2	Medium	1.5	**19.**	
	A22	Woodland: Scattered scrub	6.25	Medium	4	Good	3		15 years	1.7	Low	1	**.12**	
	A3	Woodland: Scattered trees	0.40	Medium	4	Poor	1		5 years	1.2	Low	1	**1.33**	
	B51	Wetland: Reedbed	0.57	High	6	Good	3		5 years	1.2	low	1	**.**	
	G1	Wetland: Standing water	1.03	High	6	Moderate	2		5 years	1.2	Medium	1.5	**. 7**	
		Total	**37.3**											
		abitat Enhancement						Existing value S (= F)					((NxOxP)-S)/Q/R	
B	B22	Grassland: Semi-improved neutral grassland	0.28	Medium	4	Good	3	**2.2**	10 years	1.4	Low	1	**.**	
		Total	**.2**											

Trading down correction value	0.00
abitat itigation Score (S)	**2. 7**
	HBIS = HMS - HIS
abitat Biodiversity mpact Score	**3.99** Gain
Percentage of biodiversity impact loss	

	Loss	Gain	Impact
Woodland Habitat	31.58	65.05	**33. 7**
Grassland Habitat	45.58	2.20	**- 3.3**
Wetland Habitat	0.00	15.42	**1 . 2**
Other Habitat (including Built Environment)	1.52	0.00	**-1. 2**
Total	78.68	82.67	**3.99**
		Trading down	**.**
			3.99

Derived Locally from the Defra Metric
Version 19.0 (01/04/2018)

ar ic shire, Coventry Solihull - edge mpact ssessment Calculator

KEY	
	No action required
	Enter value
	Drop-down menu
	Calculation
	Automatic lookup
	esult

This sheet calculates the impacts to hedges and lines of trees in and around the site.

These units are not transferrable as compensation for either the Habitat or Connectivity Impact Assessment scores.

Please fill in both tables

Please do not edit the formulae or structure
To condense the form for display hide vacant rows, do not delete them
If additional rows are required, or to provide feedback on the calculator please contact WCC Ecological Services

		E isting edgero features on site		edgero distinctiveness		edgero condition assessments									edgero features to be retained ith no change ithin development		edgero Biodiversity alue edgero features to be retained and enhanced. ithin development		edgero features to be lost ithin development		
T. Note	code	Hedgerow habitat description	Feature length m	istinctiveness	Score	A	A			C	C			Condition Score	length m	E isting value	length m	E isting value	length m	E isting value	Comment
		irect mpacts and retained features			A										C	A x B x C = D	E	A x B x E = F	G	A x B x G = H	
1	n/a	Hedges: species rich hedge	0.21	Medium	4	Pass	Pass	Pass	Pass	Fail	Fail	Pass	Pass	2					.21	1.	
2	n/a	Hedges: species rich hedge	0.33	Medium	4	Pass	Pass	Pass	Pass	Fail	Fail	Pass	Pass	2					.33	2.	
3	n/a	Hedges: species rich hedge	0.15	Medium	4	Pass	Pass	Pass	Pass	Fail	Fail	Pass	Pass	2	0.15	1.2					
4	n/a	Hedges: species rich hedge	0.16	Medium	4	Pass	Pass	Pass	Pass	Fail	Fail	Pass	Pass	2					.1	1.2	
5	n/a	Hedges: species rich hedge	0.09	Medium	4	Pass	Pass	Pass	Pass	Fail	Fail	Pass	Pass	2					. 9	.72	
6	n/a	Hedges: species rich hedge	0.35	Medium	4	Pass	Pass	Pass	Pass	Fail	Fail	Pass	Pass	2					.3	2.	
7	n/a	Hedges: species rich hedge	0.05	Medium	4	Pass	Pass	Pass	Pass	Fail	Fail	Pass	Pass	2					.	.	
8	n/a	Hedges: species rich hedge	0.13	Medium	4	Pass	Pass	Pass	Pass	Fail	Fail	Pass	Pass	2					.13	1.	
9	n/a	Hedges: species rich hedge	0.31	Medium	4	Pass	Pass	Pass	Pass	Fail	Fail	Pass	Pass	2					.31	2.	
11	n/a	Hedges: species rich hedge	0.20	Medium	4	Pass	Pass	Pass	Pass	Fail	Fail	Pass	Pass	2					.2	1.	
12	n/a	Hedges: species rich hedge	0.24	Medium	4	Pass	Pass	Pass	Pass	Fail	Fail	Pass	Pass	2					.2	1.92	
13	n/a	Hedges: species rich hedge	0.14	Medium	4	Pass	Pass	Pass	Pass	Fail	Fail	Pass	Pass	2	0.14	1.12					
		Total	2.36											Totals	0.29	2.32	0.00	0.00	2.07	16.56 J	
																				∑D + ∑F + ∑H	
																		Site Hedge Biodiversity Value		18.88	
		ndirect Negative mpacts													Value of loss from indirect impacts						
Before/after		impact	K												K x A x B = Li Lii	Li - Lii					
		Before																			
		After																			
		Before																			
		After																			
		Before																			
		After																			
		Before																			
		After																			
		Total	0.00													0.00 M				HIS = J + M	
																		edge mpact Score (S)		1 .	

CAUTION - Destruction of features high distinctiveness may be against local policy. Has the mitigation hierarchy been followed, can impact to these habitats be avoided?
Any unavoidable loss of valuable habitats must be replaced like-for-like. . All newly planted hedges should be native species-rich hedgerows idelly with trees.

		Proposed hedge features on site (nsite mitigation)		Target hedge distinctiveness		edgero condition assessments										Time till target condition		ifficulty of creation restoration			
T. Note	code	Phase 1 habitat description	length m	istinctiveness	Score	A	A			C	C			Condition Score		Time years	Score	ifficulty	Score	Linear biodiversity value	Comment
		edgero Creation	N		O												Q		R	(N x O x P) / Q / R	
NH 1	n/a	Hedges: species rich hedge	0.39	Medium	4	Pass	Pass	Pass	Pass	Fail	Fail	Pass	Pass	2		5 years	1.2	Low	1	2.	
NH 2	n/a	Hedges: species rich hedge	0.35	Medium	4	Pass	Pass	Pass	Pass	Fail	Fail	Pass	Pass	2		5 years	1.2	Low	1	2.33	
NH 3	n/a	Hedges: species rich hedge	0.70	Medium	4	Pass	Pass	Pass	Pass	Fail	Fail	Pass	Pass	2		5 years	1.2	Low	1	. 7	
NH 4	n/a	Hedges: species rich hedge	0.59	Medium	4	Pass	Pass	Pass	Pass	Fail	Fail	Pass	Pass	2		5 years	1.2	Low	1	3.93	
NH 5	n/a	Hedges: species rich hedge	0.05	Medium	4	Pass	Pass	Pass	Pass	Fail	Fail	Pass	Pass	2		5 years	1.2	Low	1	.33	
NH 6	n/a	Hedges: species rich hedge	0.26	Medium	4	Pass	Pass	Pass	Pass	Fail	Fail	Pass	Pass	2		5 years	1.2	Low	1	1.73	
NH 7	n/a	Hedges: species rich hedge	0.35	Medium	4	Pass	Pass	Pass	Pass	Fail	Fail	Pass	Pass	2		5 years	1.2	Low	1	2.33	
		Total	2. 8																		
		edgero Enhancement													Existing value S (= F)					((N x O x P) - S) / Q / R	
																		Trading down correction value		0.00	
																		edge itigation Score (S)		17.92	
		Total	.																HBIS = HMS - HBIS		
																		edge Biodiversity mpact Score		1.3	Gain
																		Percentage of linear impact loss			

KEY	
	No action required
	Action required
	Drop-down menu
	Calculation
	Automatic lookup
	verall ain
	verall Loss

Derived Locally from the Defra Metric
Version 19.0 (01/04/2018)

ar ic shire Coventry and Solihull - Connectivity mpact ssessment optional

KEY	
	No action required
	Enter value
	Drop-down menu
	Calculation
	Automatic lookup
	esult

Connectivity eatures
This sheet gives and indication as to whether the development will enhance connectivity thorugh or around the site.

These units are not transferrable as compensation for either the Habitat or Hedgerow Impact Assessment scores.

Please fill in both tables

Please do not edit the formulae or structure
To condense the form for display hide vacant rows, do not delete them
If additional rows are required, or to provide feedback on the calculator please contact WCC Ecological Services

	E isting Connectivity features on site		Connectivity distinctiveness		Connectivity condition		Connectivity Biodiversity alue: Connectivity features to be retained ith no change ithin development		Connectivity features to be retained and enhanced ithin development		Connectivity features to be lost ithin development		
T. Note	code	Phase 1 habitat description	*Feature length m*	*istinctiveness*	*Score*	*Condition*	*Score*	*ength m*	*E isting value*	*ength m*	*E isting value*	*ength m*	*E isting value*	***Comment***
		irect mpacts and retained features			A		B	C	A x B x C = D	E	A x B x E = F	G	A x B x G = H	
		Total	0.00				Total	0.00	0.00	0.00	0.00	0.00	0.00	J

	∑D + ∑F + ∑H
Site Connectivity Biodiversity Value	0.00

Before/after impact	**ndirect Negative mpacts**	K					Value of loss from indirect impacts K x A x B = Li, Lii	Li - Lii
Before								
After								
Before								
After								
Before								
After								
Before								
After								
Before								
After								
	Total	0.00						0.00 M

	CIS = J + M
Connectivity mpact Score (C S)	.

Biodiversity Impact Assessment Summary

Derived Locally from the Defra Metric
Version 19.0 (01/04/2018)

		Proposed linear features on site (nsite mitigation)		Target Connectivity distinctiveness		Target Connectivity condition			Time till target condition		ifficulty of creation restoration		*Connectivity biodiversity value*	
T. Note	code	Phase 1 habitat description	*ength m*	*istinctiveness*	*Score*	*Condition*	*Score*		*Time years*	*Score*	*ifficulty*	*Score*		**Comment**
		Connectivity Creation	N		O		P			Q		R	(N x O x P) / Q / R	
		Total	.											
		Connectivity Enhancement						Existing value S (= F)					((N x O x P) - S) / Q / R	
		Total	.								Trading down correction value		0.00	
											Connectivity itigation Score (C S)		.	
													CBIS = CMS - CIS	
											Connectivity Biodiversity mpact Score		.	
											Percentage of linear impact loss			

Biodiversity Impact Assessment Summary

Derived Locally from the Defra Metric
Version 19.0 (01/04/2018)

abitat trading do n correction calculator

E isting Site

Existing habitat	Area of habitat impact	Distinctiveness	High distinctiveness habitat loss biodiversity value	Medium-High distinctiveness habitat loss biodiversity value	Medium distinctiveness habitat loss biodiversity value	Medium-Low distinctiveness habitat loss biodiversity value
Direct impacts						
Other: Bare ground	0.76	Low	0.00	0.00	0.00	0.00
Woodland: Dense continuous scrub	0.42	Medium-Low	0.00	0.00	0.00	1.26
Built Environment: Buildings/hardstanding	0.72	none	0.00	0.00	0.00	0.00
Grassland: Improved grassland	16.58	Low	0.00	0.00	0.00	0.00
Woodland: Mixed plantation	14.32	Low	0.00	0.00	0.00	0.00
Woodland: Scattered scrub	0.42	Medium	0.00	0.00	1.68	0.00
Grassland: Poor semi-improved grassland	4.14	Medium-Low	0.00	0.00	0.00	12.42
Wetland: Standing water		High		0.00	0.00	0.00
Woodland: Scattered scrub		Medium	0.00	0.00		0.00
Woodland: Broad-leaved semi-natural woodland		High		0.00	0.00	0.00
Built Environment: Buildings/hardstanding	0.02	none	0.00	0.00	0.00	0.00
-			0.00	0.00	0.00	0.00
-			0.00	0.00	0.00	0.00
-			0.00	0.00	0.00	0.00
-			0.00	0.00	0.00	0.00
-			0.00	0.00	0.00	0.00
-			0.00	0.00	0.00	0.00
-			0.00	0.00	0.00	0.00
-			0.00	0.00	0.00	0.00
-			0.00	0.00	0.00	0.00
-			0.00	0.00	0.00	0.00
-			0.00	0.00	0.00	0.00
-			0.00	0.00	0.00	0.00
-			0.00	0.00	0.00	0.00
-			0.00	0.00	0.00	0.00
-			0.00	0.00	0.00	0.00
-			0.00	0.00	0.00	0.00
-			0.00	0.00	0.00	0.00
-			0.00	0.00	0.00	0.00
Indirect impacts						

Biodiversity Impact Assessment Summary

Derived Locally from the Defra Metric
Version 19.0 (01/04/2018)

-	-		0.00	0.00	0.00	0.00
-	-		0.00	0.00	0.00	0.00
-	-		0.00	0.00	0.00	0.00
-	-		0.00	0.00	0.00	0.00
-	-		0.00	0.00	0.00	0.00
TOTAL	37.38		0.00	0.00	1.68	13.68

Biodiversity Impact Assessment Summary

Derived Locally from the Defra Metric
Version 19.0 (01/04/2018)

Proposed Site

Proposed habitat creation	Area of habitat creation	Distinctiveness	High distinctiveness proposed biodiversity value	Medium-High distinctiveness proposed biodiversity value	Medium distinctiveness proposed biodiversity value	Medium-Low distinctiveness proposed biodiversity value
Grassland: Amenity grassland	0.77	Low	0.00	0.00	0.00	0.00
Built Environment: Buildings/hardstanding	9.05	none	0.00	0.00	0.00	0.00
Built Environment: Buildings/hardstanding	11.96	none	0.00	0.00	0.00	0.00
Woodland: Broad-leaved plantation	7.35	Medium	0.00	0.00	19.60	0.00
Woodland: Scattered scrub	6.25	Medium	0.00	0.00	44.12	0.00
Woodland: Scattered trees	0.40	Medium	0.00	0.00	1.33	0.00
Wetland: Reedbed	0.57	High	8.55	0.00	0.00	0.00
Wetland: Standing water	1.03	High	6.87	0.00	0.00	0.00
-	-		0.00	0.00	0.00	0.00
-	-		0.00	0.00	0.00	0.00
-	-		0.00	0.00	0.00	0.00
-	-		0.00	0.00	0.00	0.00
-	-		0.00	0.00	0.00	0.00
-	-		0.00	0.00	0.00	0.00
-	-		0.00	0.00	0.00	0.00
Proposed habitat enhancement	Area	Distinctiveness	High	Medium-High	Medium	Medium-Low
Grassland: Semi-improved neutral grassland	0.28	Medium	0.00	0.00	0.80	0.00
-	-		0.00	0.00	0.00	0.00
-	-		0.00	0.00	0.00	0.00
-	-		0.00	0.00	0.00	0.00
-	-		0.00	0.00	0.00	0.00
-	-		0.00	0.00	0.00	0.00
-	-		0.00	0.00	0.00	0.00
-	-		0.00	0.00	0.00	0.00
-	-		0.00	0.00	0.00	0.00
-	-		0.00	0.00	0.00	0.00
-	-		0.00	0.00	0.00	0.00
-	-		0.00	0.00	0.00	0.00
-	-		0.00	0.00	0.00	0.00
-	-		0.00	0.00	0.00	0.00
-	-		0.00	0.00	0.00	0.00
TOTAL	37.66		15.42	0.00	65.85	0.00

Biodiversity Impact Assessment Summary

Derived Locally from the Defra Metric
Version 19.0 (01/04/2018)

Trading o n Correction	High	Medium-High	Medium	Medium-Low
Value of existing habitat loss per distinctiveness	0.00	0.00	1.68	13.68
Value of created habitats per distinctiveness	15.42	0.00	65.85	0.00
Would this result in trading down habitats?	Never	No	No	No
If no, value each distinctiveness still requiring compensation	0	0	0	0
Surplus gain to be carried over to compensate loss of lower habitats (rolls over)	15.42	15.42	79.59	65.91
Trading down correction value	n/a	0	0	0

This calculator assess whether there is any down trading in habitats value. E.g. loss of high distinctiveness habitat cannot be compensated for by surpluss medium mitigation. It calcu
value which enters into the primary calculator to take this into account. Such that the full level of high habitat loss compensation is required. However if additional medium gain is gen
value of the high loss, this surplus is still be taken into account with on site gain.

CAUTION - Destruction of habitats of high distinctiveness, e.g. lowland meadow or ancient woodland, may be against local policy. Has the mitigation
hierarchy been followed, can impact to these habitats be avoided?
Any unavoidable loss of habitats of high distinctiveness must be replaced like-for like.

Biodiversity Impact Assessment Summary

Derived Locally from the Defra Metric
Version 19.0 (01/04/2018)

edgero trading do_n correction calculator

E_isting Site

Existing Hedgerow features	length of loss (km)	Distinctiveness	High distinctiveness Hedgerow loss biodiversity value	Medium-High distinctiveness Hedgerow loss biodiversity value	Medium distinctiveness Hedgerow loss biodiversity value	Medium-Low distinctiveness Hedgerow loss biodiversity value	Low distinctiveness Hedgerow loss biodiversity value
Direct impacts							
Hedges: species rich hedge	0.21	Medium	0.00	0.00	1.68	0.00	0.00
Hedges: species rich hedge	0.33	Medium	0.00	0.00	2.64	0.00	0.00
Hedges: species rich hedge	0.15	Medium	0.00	0.00		0.00	0.00
Hedges: species rich hedge	0.16	Medium	0.00	0.00	1.28	0.00	0.00
Hedges: species rich hedge	0.09	Medium	0.00	0.00	0.72	0.00	0.00
Hedges: species rich hedge	0.35	Medium	0.00	0.00	2.80	0.00	0.00
Hedges: species rich hedge	0.05	Medium	0.00	0.00	0.40	0.00	0.00
Hedges: species rich hedge	0.13	Medium	0.00	0.00	1.04	0.00	0.00
Hedges: species rich hedge	0.31	Medium	0.00	0.00	2.48	0.00	0.00
Hedges: species rich hedge	0.20	Medium	0.00	0.00	1.60	0.00	0.00
Hedges: species rich hedge	0.24	Medium	0.00	0.00	1.92	0.00	0.00
Hedges: species rich hedge	0.14	Medium	0.00	0.00		0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
Indirect impacts							
-	-		0.00	0.00	0.00	0.00	0.00
-	-		0.00	0.00	0.00	0.00	0.00
-	-		0.00	0.00	0.00	0.00	0.00
-	-		0.00	0.00	0.00	0.00	0.00
-	-		0.00	0.00	0.00	0.00	0.00
TOTAL	2.36		0.00	0.00	16.56	0.00	0.00

Proposed Site

Proposed hedgerow creation	Length of feature (km)	Distinctiveness	High distinctiveness proposed Hedgerow biodiversity value	Medium-High distinctiveness proposed Hedgerow biodiversity value	Medium distinctiveness proposed Hedgerow biodiversity value	Medium-Low distinctiveness proposed Hedgerow biodiversity value	Low distinctiveness proposed Hedgerow biodiversity value
Hedges: species rich hedge	0.39	Medium	0.00	0.00	2.60	0.00	0.00
Hedges: species rich hedge	0.35	Medium	0.00	0.00	2.33	0.00	0.00
Hedges: species rich hedge	0.70	Medium	0.00	0.00	4.67	0.00	0.00
Hedges: species rich hedge	0.59	Medium	0.00	0.00	3.93	0.00	0.00
Hedges: species rich hedge	0.05	Medium	0.00	0.00	0.33	0.00	0.00
Hedges: species rich hedge	0.26	Medium	0.00	0.00	1.73	0.00	0.00
Hedges: species rich hedge	0.35	Medium	0.00	0.00	2.33	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-			0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
Proposed hedgerow enhancement	Length	Distinctiveness	High	Medium-High	Medium	Medium-Low	Low
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
TOTAL	2.69		0.00	0.00	17.92	0.00	0.00

edgero trading do_n correction	High	Medium-High	Medium	Medium-Low	Low
Value of existing habitat loss per distinctiveness	0.00	0.00	16.56	0.00	0.00
Value of created habitats per distinctiveness	0.00	0.00	17.92	0.00	0.00
Would this result in trading down habitats?	Never	No	No	No	No
If no, value each distinctiveness still requiring compensation	0	0	0	0	0.00

Biodiversity Impact Assessment Summary

Derived Locally from the Defra Metric
Version 19.0 (01/04/2018)

Surplus gain to be carried over to compensate loss of lower habitats (rolls over)	0	0	1.36	1.36	n/a	Total
Trading down correction value	n/a	0	0	0	0	.

This calculator assess whether there is any down trading in Hedgerow habitats. E.g. loss of high distinctiveness habitat and surplus creation of medium or low habitats. It calculates a correction value which enters into the primary calculator to take this into account. Such that the full level of high habitat loss compensation is required. However if additional medium gain is generated above the value of the high loss, this surplus is still be taken into account with on site gain.

CAUTION - Destruction of each habitat of medium distinctiveness and above should be mitigated for with creation/restoration of a similar habitat. Trading up of habitat type is encouraged.

Biodiversity Impact Assessment Summary

Derived Locally from the Defra Metric
Version 19.0 (01/04/2018)

Linear trading do n correction calculator

E isting Site

Existing linear features	length of loss (km)	Distinctiveness	High distinctiveness linear loss biodiversity value	Medium-High distinctiveness linear loss biodiversity value	Medium distinctiveness linear loss biodiversity value	Medium-Low distinctiveness linear loss biodiversity value	Low distinctiveness linear loss biodiversity value
Direct impacts							
-			0.00	0.00	0.00	0.00	0.00
-			0.00	0.00	0.00	0.00	0.00
-			0.00	0.00	0.00	0.00	0.00
-			0.00	0.00	0.00	0.00	0.00
-			0.00	0.00	0.00	0.00	0.00
-			0.00	0.00	0.00	0.00	0.00
-			0.00	0.00	0.00	0.00	0.00
-			0.00	0.00	0.00	0.00	0.00
-			0.00	0.00	0.00	0.00	0.00
-			0.00	0.00	0.00	0.00	0.00
-			0.00	0.00	0.00	0.00	0.00
-			0.00	0.00	0.00	0.00	0.00
-			0.00	0.00	0.00	0.00	0.00
-			0.00	0.00	0.00	0.00	0.00
-			0.00	0.00	0.00	0.00	0.00
-			0.00	0.00	0.00	0.00	0.00
-			0.00	0.00	0.00	0.00	0.00
-			0.00	0.00	0.00	0.00	0.00
-			0.00	0.00	0.00	0.00	0.00
-			0.00	0.00	0.00	0.00	0.00
-			0.00	0.00	0.00	0.00	0.00
-			0.00	0.00	0.00	0.00	0.00
-			0.00	0.00	0.00	0.00	0.00
-			0.00	0.00	0.00	0.00	0.00
-			0.00	0.00	0.00	0.00	0.00
-			0.00	0.00	0.00	0.00	0.00
-			0.00	0.00	0.00	0.00	0.00
-			0.00	0.00	0.00	0.00	0.00
-			0.00	0.00	0.00	0.00	0.00
-			0.00	0.00	0.00	0.00	0.00
Indirect impacts							
-	-		0.00	0.00	0.00	0.00	0.00
-	-		0.00	0.00	0.00	0.00	0.00
-	-		0.00	0.00	0.00	0.00	0.00
-	-		0.00	0.00	0.00	0.00	0.00
-	-		0.00	0.00	0.00	0.00	0.00
TOTAL	0.00		0.00	0.00	0.00	0.00	0.00

Biodiversity Impact Assessment Summary

Derived Locally from the Defra Metric
Version 19.0 (01/04/2018)

Proposed Site

Proposed linear creation	Length of feature (km)	Distinctiveness	High distinctiveness proposed linear biodiversity value	Medium-High distinctiveness proposed linear biodiversity value	Medium distinctiveness proposed linear biodiversity value	Medium-Low distinctiveness proposed linear biodiversity value	Low distinctiveness proposed linear biodiversity value
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
Proposed linear enhancement	Length	Distinctiveness	High	Medium-High	Medium	Medium-Low	Low
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
-	0.00		0.00	0.00	0.00	0.00	0.00
TOTAL	0.00		0.00	0.00	0.00	0.00	0.00

Linear trading do n correction	High	Medium-High	Medium	Medium-Low	Low	
Value of existing habitat loss per distinctiveness	0.00	0.00	0.00	0.00	0.00	
Value of created habitats per distinctiveness	0.00	0.00	0.00	0.00	0.00	
Would this result in trading down habitats?	Never	No	No	No	No	
If no, value each distinctiveness still requiring compensation	0	0	0	0	0.00	
Surplus gain to be carried over to compensate loss of lower habitats (rolls over)	0	0	0	0	n/a	Total
Trading down correction value	n/a	0	0	0	0	.

Biodiversity Impact Assessment Summary

Derived Locally from the Defra Metric
Version 19.0 (01/04/2018)

This calculator assess whether there is any down trading in linear habitats. E.g. loss of high distinctiveness habitat and surplus creation of medium or low habitats. It calculates a correction value which enters into the primary calculator to take this into account. Such that the full level of high habitat loss compensation is required. However if additional medium gain is generated above the value of the high loss, this surplus is still be taken into account with on site gain.

CAUTION - Destruction of each habitat of medium distinctiveness and above should be mitigated for with creation/restoration of a similar habitat. Trading up of habitat type is encouraged.

Biodiversity Impact Assessment Summary

Derived Locally from the Defra Metric
Version 19.0 (01/04/2018)

Phase 1 abitat Type	Phase 1 abitat Codes	istinctiveness			ifficulty of creation		Preset Time to Target Condition (oderate)	Preset Time to Target Condition (ood)	ifficulty of restoration		Preset Time to Target Condition (oderate)	Preset Time to Target Condition (ood)	Priority abitat abitat of Principal mportance	LB P Priority abitat	N C	abitat efinition	Notes	Condition ssessment	abitat creation restotation timescales
Built Environment: Buildings/hardstanding	n/a	none	0	Low	1	n/a	n/a	Low	1	n/a	n/a	Not a priority habitat	Not a priority habitat				Classify as poor condition	
Built Environment: Gardens (lawn and planting)	n/a	Low	1	Low	1	n/a	n/a	Low	1	n/a	n/a	Not a priority habitat	Not a priority habitat				Classify as poor condition	0-5 years
Woodland: Broad-leaved semi-natural woodland	A111	High	6	n/a	-	n/a	n/a	Low	1	W_in_P	W_in_P	Lowland mixed deciduous woodland	Woodland	W8,W10, W16	Include all stands which do not obviously originate from planting. Both ancient and more recent stands are included. Woodland where more than 30% is planted should be classified as plantation. However, mature plantations (more than about 120 years old) of locally native species where there are semi-natural woodland ground flora and shrub communities should be classified as semi-natural (NCC, 1990). See Phase 1 Survey Handbook for definition of woodland types included in semi-natural category.		Use FEP T08 condition assessment	Planted native woodlands will be about 120 years old before they can be considered semi-natural and should be composed of locally native species and have semi-natural woodland ground flora and shrub communities (Phase 1 Survey Handbook, NCC 1990) therefore cannot be created on timescales used in BIA. Timescales for the restoration of existing semi-natural woodland will depend on reasons for unfavourable condition. Timescales for restoration will depend on reasons for unfavourable condition (see condition assessment) and management required to improve condition.
Woodland: Broad-leaved plantation	A112	Medium	4	Medium	1.5	32+ years	n/a	Low	1	W_in_P	W_in_P	Not a priority habitat	Not a priority habitat	Some forms of W8, W10, W16 or non NVC	Obviously planted woodland with no more than 10% of the canopy made up of conifer trees (NCC, 1990). See Phase 1 Survey Handbook for exceptions. The category includes recent stands (i.e less than about 120 years) planted with locally native trees. The phase 1 handbook does not define a mininmum size but the National Inventory of Woodland and Trees defines woodland as having a minimum area of 0.5ha and a minimum width of 20m.		Use T08 even though this habitat does not meet strict FEP definition for use with T08.	It is likely to take more than 100 years before the planted woodlands approach good condition e.g. with an age and structural diversity including canopy, understory and field layer that supports plants, insect, mammal and bird species typical of native woodlands. For these reasons, aim for moderate condition in 32+ years. The minimum woodland size for Countryside Stewardship woodland creation grants is 0.5 hectares and must have a mimimum width of 20 metres.
Woodland: Coniferous semi-natural woodland	A121	Medium	4	n/a	-	n/a	n/a	Low	1	n/a	n/a	Native pine woodlands (Scotland only). Yew stands are inclued in the lowland beech and yew woodland plan and upland mixed ashwood plan.	n/a	W13, W18		This woodland type s not found in Warwickshire	Use T08 even though this habitat does not meet strict FEP definition for use with T08.	n/a
Woodland: Coniferous plantation	A122	Low	2	Medium	1.5	n/a	n/a	Low	1	n/a	n/a	Not a priority habitat	Not a priority habitat	Some forms of W10, W16 or non NVC	Obviously planted woodland with no more than 10% of the canopy made up of broadleaved trees (NCC, 1990). See Phase 1 Survey Handbook for exceptions. Typical trees species include larch (*ari* spp), pine (*Pinus* spp) and spruce (*Picea* spp).		Classify as poor condition	n/a
Woodland: Mixed semi-natural woodland	A131	Medium	4	n/a	-	n/a	n/a	Low	1	W_in_P	W_in_P	Lowland mixed deciduous woodland	Woodland		Woods that do not obviously originate from planting (see Phase 1 Survey Handbook for exceptions) with a canopy made up of between ten and ninety percent of either broadleaved and coniferous trees (NCC, 1990).		Use FEP T08 condition assessment	
Woodland: Mixed plantation	A132	Low	2	Medium	1.5	32+years	n/a	Low	1	W_in_P	W_in_P	Not a priority habitat	Not a priority habitat		Obviuosly planted with 10-90% of either broadleaved or conifer trees in the canopy (NCC, 1990). See Phase 1 Survey Handbook for exceptions.		Use T08 even though this habitat does not meet strict FEP definition for use with T08.	It is likely to take more than 100 years before the planted woodlands approach good condition e.g. with an age and structural diversity including canopy, understory and field layer that supports plants, insect, mammal and bird species typical of native woodlands. Target condition should be moderate in 32+ years.
Woodland: Wet woodland	n/a	High	6	Medium	1.5	32+years	n/a	Medium	1.5	W_in_P	W_in_P	Wet woodland	Woodland	W1 - W7	Wet woodlands are found on poorly drained or seasonally wet soils. They are commonly found on floodplains, alongside rivers and stream, on fens and in damper areas of other woodland types. Alder, birch and willows are usually the dominant tree species.	Wet woodland is scarce in the County.	Use FEP T08 condition assessment	
Woodland: Dense continuous scrub	A21	Medium-Low	3	Low	1	10 years	15 years	Low	1	W_in_P	W_in_P	Not a priority habitat	Not a priority habitat	W21-24	A block of scrub is dominated by the shrub species less than five metres tall. It may have a few scattered trees but there will be no recognisable canopy. To be dense or continuous, the scrub cover must be thirty percent or more. This includes stands of bramble, dog Rose and gorse (*le europaeus*) and also stands of mature hawthorn (*Crataegus monogyna*), blackthorn (*Prunus spinosa*) or grey willow (Salix cinerea) even if they are greater than 5m tall. (NCC, 1990).	Scrub is often part of mosaic with other habitats. Its conservation value can be variable, and is often seen as of low value due to low botanical species diversity. However, it can be of high value in its own right as well as providing suitable habitat for some of the county's important species of invertebrates, mammals and birds.	Use condition assessment V05 for scrub, even if the scrub does not meet the FEP definition of high environmental value scrub.	Scrub of high conservation value contains a range of shrub species (at least 3) with mixed age structure, has a complex vertical and horizontal structure i.e. variation in physical structure, age range and spacing, has many clearings and glades giving a high boundary/area ratio, a well developed edge with ungrazed tall herbs, and supports a range of rare/local invertebrates. Scrub typically matures in 15 years (RSPB), so it should be possible to create good quality scrub in 15 years with suitable management e.g. rotational cutting that achieves the above conditions.
Woodland: Scattered scrub	A22	Medium	4	Low	1	10 years	15 years	Low	1	W_in_P	W_in_P	Not a priority habitat	Not a priority habitat	W21-24	As above but scrub cover is less than thirty percent.	Scattered scrub occurs in association with other semi-natural habitats, frequently occurring as a mosaic with grassland or early uccessional communities, and often having occasional scattered trees. The presence of scattered scrub can add to a sites ecological interest. Where scrub is part of a habitat mosaic, for example with grassland, the habitat with the higher distinctiveness score should automatically be entered in the BIA.	Use condition assessment V05 for scrub, even if the scrub does not meet the FEP definition of high environmental value scrub.	Scrub of high conservation value contains a range of shrub species (at least 3) with mixed age structure, has a complex vertical and horizontal structure i.e. variation in physical structure, age range and spacing, has many clearings and glades giving a high boundary/area ratio, a well developed edge with ungrazed tall herbs, and supports a range of rare/local invertebrates. Scrub typically matures in 15 years (RSPB), so it should be possible to create good quality scrub in 15 years with suitable management e.g. rotational cutting that achieves the above conditions.
Woodland: Scattered trees	A3	Medium	4	Low	1	32+ years	n/a	Low	1	W_in_P	W_in_P	Not a priority habitat	Not a priority habitat		Habiat that is neither woodland or scrub, but have trees present. Tree cover must be less than thirty percent. However, most examples of planted trees over amenity grassland should be included in this category even where tree cover exceeds 30%	The area calculation should be the whole land parcel on which the scrub/trees are planted and not just the cover the individual trees/shrubs. Where a parcel of land has more than one habitat e.g. scatterd trees on grassland, the habitat with the higher distinctiveness score should be entered.	No FEP condition assessment. See next column for important attributes.	The ecological value of scattered trees will depend on the tree species (species such as oak, birch, hawthorn and willows are most valuable), age (large, mature trees have higher value), location (the proximity of other habitats that add habitat, species and structural diversity), the presence of features such as decay, loose bark, dense ivy cover etc. It takes decades for these features to develop.
Woodland: Broad-leaved parkland	A31	High	6	Medium	1.5	n/a	n/a	Low	1	W_in_P	W_in_P	Wood-pasture and parkland	Old parkland & veteran trees	Range of NVC types	This category is for Wood Pasture and Parkland Priority Habitat/Habitat of Principle Importance only. Wood-pasture and parkland is not defined by any particular type(s) of vegetation, NVC types, or Phase 1 habitat types. Instead they are mosaic habitats valued for their trees, especially veteran and ancient trees, and the plants and animals that they support (LBAP).	This habitat is typical of large estates with a history of traditional management e.g. grazing by cattle or deer, but can also be found in cemeteries and churchyards. Such sites can often be important due to the presence of large numbers of mature trees and can also have historic, cultural and landscape importance.	Use FEP T03 condition assessment	Timecales for restoration will depend on reasons for current condition and management required to improve condition. Reasons for unfavourable condition may include e.g. loss of old trees (disease, root damage, soil compaction, felling) lack of replacement trees, lack of standing and fallen deadwood (removed for safety reasons, over-tidying), inappropriate management e.g. intensive grazing levels.
Woodland: Coniferous parkland	A32	Medium	4	Medium	1.5	n/a	n/a	Low	1	W_in_P	W_in_P	Not a priority habitat	n/a		Parklands with introduced exotic trees such as cedar (Cedrus spp).			
Woodland: Recently felled woodland	A4	Low	2	n/a	-	n/a	n/a	n/a	-	n/a	n/a	Not a priority habitat	Not a priority habitat		Only include areas where future land use is uncertain, e.g., if it is not clear whether they are to be replanted.		Classify as poor condition	n/a
Woodland: Orchard	A5	High	6	Low	1	W_in_P	W_in_P	Low	1	W_in_P	W_in_P	Traditional orchard	Orchards	Range of NVC types	This category is for Traditional Orchards Priority Habitat/Habitats of Principal Importance only. Intensively managed orchards are not included. Tradition orchards are defined as groups of fruit and nut trees planted on vigorous rootstocks at low densities in permanent grassland and managed in a low intensity way. The minumum size of a traditional orchard is defined as at least five trees with crown edges less than 20m apart. Orchards are a mosaic habitat containing fruit trees, deadwood, pasture or meadow, scrub, hedgerows, ponds etc. Prime examples support a diversity of vascular plants, bryophytes, lichens, fungi, vertebrates and invertebrates including BAP species, nationally rare and scarce species.		Use FEP T15 or PTES (Peoples Trust for Endangered Species) condition assessment (see PTES/NE Project Report NECR077)	The PTES condition assessment has 3 condition categories: excellent (established, mixed ages of tree, grazed, standing and fallen deadwood), good/fair (includes newly planted or young orchards that are mown, they lack good deadwood habitat and the mature trees that can provide it naturally), poor (gappy, no new trees, scrubbed over, trees damaged). Newly planted orchards can therefore be in moderate (i.e PTES good/fair) condition in 5-10 years provided assocatied habitats e.g. wildflower grassland, hedges, scrub, deadwood logpiles etc are incorporated. It will take a lot longer to achieve good condition i.e. trees of varying age, standing and fallen deadwood etc. See PTES website and Natural Englands Technical information notes (TIN12 to 21) for advice on planting, species and varities, wildlife, location, rootstocks etc), also Countryside Stewardship, Creation of traditional orchards option BE5.
Grassland: Unimproved acidic grassland	B11	High	6	Medium	1.5	n/a	n/a	Low	1	W_in_P	W_in_P	Lowland dry acid grassland	Acid grassland	U1-U4	Lowland acid grassland typically occurs on nutrient poor, free-draining soils of low pH (<5.5). Acid grasslands are characteristically species poor with typical species that include fine-leaved grasses such as common bent, sheep's fescue, mat-grass and wavy hair-grass and forbs such as heath bedstraw, tormentil and sheep's sorrel. Although species-poor compared to other semi-natural grasslands, it contains important communities with species that are rare in the region.	Lowland acid grasslands are very rare in Warwickshire sub region. The HBA (2012) recorded a total resource of 72.7ha (2.4ha unimproved and 70.3ha semi-improved). It is mainly associated with heathland, woodland or post-industrial sites. They are largely confined to the acid glacial soils in the north of the County on the Midlands Plateau Natural Area where they persist as fragments.	Use FEP G05 condition assessment	Unimproved grasslands cannot be recreated, at least not on timesacles used in the BIA metric. It is possible to create BAP quality grasslands that resemble old unimproved grasslands but these classified as semi-improved - see below.
Grassland: Semi-improved acidic grassland	B12	Medium-High	5	Medium	1.5	15 years	W_in_P	Low	1	W_in_P	W_in_P	Lowland dry acid grassland	Acid Grassland	U1-U4	Improvement reduces the acid character of the grassland and semi-improved acid grasslands will contain a mesotrophic species element (such as white clover, yarrow, common mouse-ear, perennial rye-grass, Yorkshire fog) but in practice, it can be difficult to separate unimproved and semi-improved grasslands.	See above	Use FEP G05 condition assessment	A review of agri-environment schemes (5 sites) found it is possible to create/restore lowland dry acid grassland PH within 10-20 years. One site created (20 years ago) on a field of free draining sand has a well established U1c grassland in good condition. The 4 restored sites were in moderate (3 sites) or good (1 site) condition over timescales of 10-20 years by reinstatement of management e.g, grazing, tree/shrub clearance. See attached guidance for details.

	Grassland: Unimproved neutral grassland	B21	High	6	Medium	1.5	n/a	n/a	Low	1	W_in_P	W_in_P	Lowland meadow	Neutral grassland	MG4, MG5, MG8	Unimproved neutral grasslands are found on neutral clays and alluvial soils which have not been subject to alteration through the use of fertilizers, slurry and herbicides. They are the product of a long history of traditional management such as hay making (meadows) or low intensity grazing (pastures) over many decades. Species diversity is often high (but where neglected can be rank) and can include rare or scarce plants such as green-winged orchid, dyer's greenweed, pepper saxifrage and adder's tongue fern. They also support a diverse fauna, especially invertebrate species.	True unimproved grassland is now very rare in the sub region. The HBA recorded 174ha in 2017. SSSIs account for 73ha (40%) of this total. Outside of SSSIs remnant unimproved grasslands are generally small and highly fragmented, found on nature reserves, small 'hobby' farms, churchyards, traditional orchards, woodland rides, churchyards, as fragments of remnant old grassland that have escaped intensification e.g. within or on the edge of urban areas. Many of these are designated as Local Wildlife Sites.	Use FEP G06 condition assessment	Studies (see attached guidance) give timescale trajectories of many decades for the recreation of unimproved neutral grassland. It is possible to create grasslands that superficially resemble species-rich grasslands (see below) but these will not have the natural vegetation patterns, full range of plant species and undisturbed soil fuana and flora of unimproved grasslands.
	Grassland: Semi-improved neutral grassland	B22	Medium	4	Medium	1.5	15 years	W_in_P	Low	1	15 years	W_in_P	Lowland meadow	Neutral grassland	MG1, MG6, MG4, MG5	Semi-improved neutral grasslands have been subject to some form of agricultural improvement such as fertilizer application, use of herbicide, intensive grazing or drainage but are typically not subject to regular reseeding (improved grasslands). Semi-improved grasslands cover a very broad range of grassland quality from almost unimproved (species-rich) to species-poor semi-improved grassland that is just slightly more species-rich than agriculturally improved grassland.	Species-rich semi-improved grassland is more widespread in the sub region than unimproved grassland but still scarce. Species diversity will be lower than unimproved grasslands but still of high botanical diversity supporting grassland communities that resemble MG5 or MG4 grassland with species such as common knapweed, lady's bedstraw, yellow rattle, common bird's-foot-trefoil, meadow vetchling, oxeye daisy and great burnet but often at lower frequencies than seen in unimproved meadows. Rarer species associated with true unimproved grasslands will also tend to be absent.	Use FEP G06 condition assessment	Evidence from agri-environment schemes (Wilson et al - see attached guidance) show that it is possible to create/restore lowland meadow PH of moderate to good quality typically in 8-15 years. Careful site selection (e.g. low soil nutrient levels) and suitable management (e.g. cutting and grazing) are important. Low frequency of positive indicator species was the primary reason for grasslands failing to achieve good status. It is possible therefore to create/restore lowland meadow PH to good condition in 10 years on high potential sites (see FEP manual Keys 1 and 2c). On low potential sites, moderate condition in 15 years is a more realistic target.
	Grassland: Unimproved calcareous grassland	B31	High	6	Medium	1.5	n/a	n/a	Low	1	W_in_P	W_in_P	Lowland calcareous grassland	Calcareous grassland	CG2, CG5	Calcareous grassland supports a range of plant communities in which lime-tolerant (calcicolous) plants are characteristic. Typical forb species include common centuary, yellow-wort, kidney vetch and dwarf thistle and grasses such as sheep's fescue, tor-Grass, upright brome, crested hair-grass and meadow oat-grass.	Calcareous grassland is very rare in the sub-region, largely confined to the south and east of Warwickshire within the Cotswolds and Feldon areas (and with limited areas in the south of the Arden). The majority has a relatively recent origin, falling within old or partially worked quarries, where disturbance has ceased some time ago. Further more important examples occur in cuttings. A little exists within agricultural settings (often on steeper ground that has been left out of improvement schemes) and along some road verges and railway or canal cuttings (Warwickshire LBAP). The latest figures from Habitat Biodiversity Audit (HBA, 2012) give the total area of calcareous grassland in Warwickshire, Coventry and Solihull to be 118 ha (35ha unimproved and 83ha semi-improved). A large part of this resource is included within designated sites (SSSIs and LWSs)	Use FEP G04 condition assessment	Studies suggest timescale trajectories of 60-100 years for the restoration of ancient calcareous grasslands (see attached guidance).
	Grassland: Semi-improved calcareous grassland	B32	Medium-High	5	Medium	1.5	15 years	W_in_P	Low	1	15 years	W_in_P	Lowland calcareous grassland	Calcareous grassland	CG2, CG5	Semi-improved calcareous grasslands that have been improved by the addition of some fertiliser will contain some mesotrophic species such as white clover, yarrow, Yorkshire fog, cock's-foot and crested dog's-tail.		Use FEP G04 condition assessment	A review of agri-environment schemes (Wilson et al) found it is possible to create/restore lowland calcareous grassland PH in 8-15 years. However, low soil nutruent levels and suitable grazing management are important. Of 15 sites studied, 10 were in good condition and 5 were in moderate condition.
	Grassland: Poor semi-improved grassland	B6	Medium-Low	3	Medium	1.5	n/a	n/a	Low	1	n/a	n/a	Not a priority habitat	Not a priority habitat	Some examples of MG6	This consists of semi-improved grassland which is more improved, poorer in species diversity, and more resembles species-poor neutral grassland irrespective of the underlying soil type. However, it is noticeably less improved and more species rich than improved grassland (NCC, 1990). Typical species including Yorkshire fog, meadow foxtail, cock's-foot, red fescue, ribwort plantain and meadow buttercup.		Classify as poor condition	n/a
	Grassland: Improved grassland	B4	Low	2	n/a	-	n/a	n/a	Low	1	n/a	n/a	Not a priority habitat	Not a priority habitat	MG6a, MG7	Improved grasslands are dominated by a limited range of grasses, particularly perennial rye-grass and have a very low forb diversity characteristically dominated by white clover.	It is the commonest grassland type in the County.	Classify as poor condition	n/a
	Grassland: Marsh / Marshy grassland	B5	High	6	High	3	15 years	W_in_P	Medium	1.5	W_in_P	W_in_P	Coastal and floodplain grazing marsh Purple moor-grass and rush pasture Lowland meadow		MG8-10, MG12, M22-28	This is a diffuse category covering certain Molinia grasslands, grasslands with a high proportion of Juncus species, Carex species or Filipendula ulmaria, and wet meadows and pastures supporting communities of species such as Caltha palustris or Valeriana species, where broadleaved herbs predominate over grasses.		Use FEP G07 condition assessment	A review of agri-environment schemes (by Wilson et al - see attached guidance) looked at three wet grassland schemes - one creation, two restoration. One site created on arable land (previously a fen) by raising water levels and natural regeneration from seedbank, was purple moor grass & ruch pasture PH in moderate condition after 12 years. The restored sites (scrub clearance and/or grazing) had achieved good condition after 2 & 11 years.
	Grassland: Dry heath / Acidic grassland mosaic	D5	High	6	Medium	1.5	W_in_P	W_in_P	Medium	1.5	W_in_P	W_in_P	Lowland heathland Lowland dry acid grassland	Lowland heathland		This represents a common mixture of dry heath and acid grassland.Lowland heathland is typified by the presence of low growing shrubs such as heather (*Calluna vulgaris* , dwarf gorse (*le minor*) and cross-leaved heath (*Erica tetrali* .	Heathland is very rare in the County. The HBA (2012) has recorded 7.76ha of dry heath/acid grassland mosaic. They are mainly associated with common land and woodland on the acid glacial soils in the north of the county.	Use FEP M03 & G05	
	Grassland: Set-aside / Arable field margins	J113	High	6	Low	1	W_in_P	W_in_P	Low	1	W_in_P	W_in_P	Arable field margins	Arable field margins		Arable field margins are herbaceous strips or blocks around arable fields that are managed specifically to provide benefits for wildlife (see UK BAP, 2008 for definition of margin types that are included and those that are excluded). They are valued for supporting scarce/rare arable plants as well as invertebrates and nesting and feeding birds.		Use FEP species features, including SP02 uncommon vascular plants.	
	Grassland: Amenity grassland	J12	Low	2	Low	1	n/a	n/a	Low	1	n/a	n/a	Not a priority habitat	Not a priority habitat	Various grassland forms but mostly MG6, MG7	This comprises intensively managed and regularly mown grasslands, typical of lawns, playing fields, golf course fairways and many urban 'savannah' parks, in which perennial rye grass, with or without white clover, often predominates. The sward composition will depend on the original seed mixture used and on the age of the community. Herbs such as daisy, greater plantain and dandelion may be present. If the amenity grassland has a sward rich in herbs, it may be possible to classify it as semi-improved acidic, neutral or calcareous grassland, as appropriate. In such cases, the area concerned should be mapped as the specific grassland type and its amenity use target noted (NCC, 1990).		Classify as poor condition	n/a
	Wetland: Standing water	G1	High	6	Medium	1.5	W_in_P	W_in_P	Medium	1.5	W_in_P	W_in_P	Ponds	Ponds		Standing water includes lakes, reservoirs, pools, flooded gravel pits, ponds, water-filled ditches and canals.	Typical floating and submerged plant species include Duckweed (Lemna spp.), Canadian pondweed (Elodea canadensis), Hornwort (Ceratophyllum spp.), amphibious bistort (Persicaria amphibia) and yellow water-lily (Nuphar lutea). Standing water bodies are important for a vast range of plants and animals, including several protected species such as great crested newt.	Use FEP W07 condition assessment	Ponds colonise rapidly with plants, invertebrates and ampibians and can take just a few years to be of high wildlife value. However, the value of ponds is affected by the water quality (e.g. elevated nutrient levels), pollution risk e.g. road-runoff, presence of stream inflows, location (ponds in urban and arable areas tend to be of poorer quality). Good quality ponds tend to occur in close proximity to other ponds or wetland habitats and where they are buffered by semi-natural habitat. These factors should be taken into account when deciding on target condition.
	Wetland: Running water	G2	High	6	Medium	1.5	W_in_P	W_in_P	Medium	1.5	W_in_P	W_in_P	Rivers & streams	Rivers & streams		Running water comprises rivers and streams (but not canals, which are classed as Standing Water).	The habitat quality of watercourses can vary widely, with many adversely affected by human activities, such as channel straightening and pollution. However there are also many that have significant wildlife value, providing habitat for a range of plants and animals including protected species such water vole and otter.	No FEP condition assessment. See next colum	Good quality watercourses will have a divesity of natural channel features typical of lowland watercourses. These include a variety of flow patterns (riffles, runs, glides, pools and marginal dead water), a variety of channel features (side bars, point bars, silt deposits and islands), meanders and associated erosion/deposition features and natural variation of bankside habitats.
	Wetland: Reedbed	F1	High	6	low	1	W_in_P	W_in_P	low	1	W_in_P	W_in_P	Reedbeds	Reedbeds		Reed beds are wetlands dominated by, but not necessarily composed purely of, stands of the common reed (Phragmites australis). They can include areas of reed which are both wet and dry at their base but usually the water table is at or above ground level for much of the year (LBAP). Usaully part of a mosaic with open water and ditches, wet grassland, wet woodland etc. They usually require management e.g. grazing, cutting, scrub control to maintain a mosaic of vegetation at different stages of growth.	Reed beds are not common or extensive in the sub-region, being mainly associated with sand and gravel extraction within certain river valleys (e.g. the Tame and Avon), some water-filled limestone quarries, a few mining subsidence pools and formal lakes in country house estates, and occasionally as narrow fringes of reed along rivers, canals and ditches. There are dozens of small reed beds, though large ones are few in number and probably only account for 25-30ha.	Use FEP W08 condition assessment	Newly created reed bed can establish very rapidly ie within a few growing seasons (RSPB). However, reedbed habitat quality can vary greatly depending on size, degree of wetness and dryness, scrub cover, soil type, water quality and management. These factors should be taken into account when making decisions about target condition.

	Wetland: Sphagnum Bog	E11	High	6	Very High	10	n/a	n/a	High	3	n/a	n/a	Blanket bog Lowland raised bog	n/a	M1-3, M17-20		Habitat not found in Warwickshire	n/a	n/a
	Wetland: Acid/neutral flush	E21	High	6	High	3	W_in_P	W_in_P	Medium	1.5	W_in_P	W_in_P	Lowlansd fens	Fen & swamp		These typically support species-poor vegetation consisting of a Sphagnum carpet overlain by Carex or Juncus species. Characteristic moss species include Sphagnum recurvum, S. palustre and S. auriculatum. Overlying vegetation may consist of small Carex species (Carex echinata, C. nigra or C cura), Carex rostrata, Juncus acutifloris, J. effusus, J. squarrosus, or Eriophorum angustifolium.	Extremely rare in the County e.g. Coleshill and Bannerly Pools SSSI	Use FEP W04 condition assessment	n/a
	Wetland: Basin Mire	E32	High	6	High	3	n/a	n/a	Medium	1.5	n/a	n/a	Lowland fens	n/a	Various mire communities	Basin mire is a topogenous fen, fed by ground water or streams. It develops in a waterlogged basin and does not contain much open water. The vegetation may be dominated by Sphagnum species, together with Carex rostrata and ericoids, or by tall swamp plants such as Phragmites australis, Schoenoplectus (Scirpus) lacustris and Typha species	Habitat not found in Warwickshire	n/a	n/a
	Wetland: Swamp	F1	High	6	High	3	W_in_P	W_in_P	Medium	1.5	W_in_P	W_in_P	Lowland fens	Fen & swamp		Swamp contains tall emergent vegetation typical of the transition between open water and exposed land. Swamps are generally in standing water for a large part of the year. Swamp vegetation includes both mixed and single-species stands include reedmace (Typha spp.), common reed (Phragmites australis), reed canary-grass (Phalaris arundinacea), reed sweet-grass (Glyceria maxima) and tall sedge species (Carex spp.).	The Phase 1 category includes reedbed (see above) as well as fen and swamp.	Use FEP W04 condition assessment	
	Wetland: Inundation vegetation	F22	High	6	Low	1	W_in_P	W_in_P	Low	1	W_in_P	W_in_P	Not a priority habitat	Fen & swamp	MG11, MG13, OV28-36	Inundation vegetation covers areas that are periodically inundated. The species community is generally open and inherently unstable. Typical species present may include the following: knot grass (Polygonum) species, bulbous rush (Juncus bulbosus), beggartick and bur-marigold (Bidens) species, creeping bent grass (Agrostis stolonifera), marsh foxtail (Alopecurus geniculatus), as well as many ruderal species (NCC, 1990).			
	Other: Arable	J11	Low	2	n/a	-	n/a	n/a	n/a	-	n/a	n/a	Not a priority habitat	Not a priority habitat		This includes arable cropland, horticultural land (for example nurseries, vegetable plots, flower beds), freshly-ploughed land and recently reseeded grassland, such as rye grass and ryeclover leys, often managed for silage (NCC, 1990).		Classify as poor condition	0-5 years
	Other: Continuous bracken	C11	Low	2	Low	1	W_in_P	W_in_P	Low	1	W_in_P	W_in_P	Not a priority habitat	Not a priority habitat	W25	Areas dominated by Pteridium aquilinum (NCC, 1990).		Bracken should be classed as poor condition unless it meets the FEP definition of high environmental value bracken in which case its condition should be assessed against V05*.	
	Other: Tall ruderal	C31	Medium-Low	3	Low	1	W_in_P	W_in_P	Low	1	W_in_P	W_in_P	Not a priority habitat	Not a priority habitat	OV24-27	This category comprises stands of tall perennial or biennial dicotyledons, usually more than 25cm high, of species such as rosebay willowherb and common nettle (NCC, 1990). It is often found as a habitat-edge community and in urban areas is frequently found on post industrial sites/waste ground.		Classify as poor condition, unless it meets the criteria LWS selection.	
	Other: Non-ruderal	C32	Medium	4	Low	1	W_in_P	W_in_P	Low	1	W_in_P	W_in_P	Not a priority habitat	Not a priority habitat		Non-wooded stands of species such as Oreopteris limbosperma, Athyrium felix-femina, Dryopteris species or Luzula sylvatica should be included in this category (NCC, 1990).		Classify as poor condition	
	Other: Ephemeral/short perennial	J13	Low	2	Low	1	W_in_P	W_in_P	Low	1	W_in_P	W_in_P	Not a priority habitat	Not a priority habitat		Short, patchy plant associations typical of derelict urban sites, quarries and railway ballast. The vegetation typically lacks a clear dominant species, but consists of a mixture of low-growing plants, often less than 25 cm high, such as greater plantain, creeping buttercup, white clover, black medick, coltsfoot, oxeye daisy and ragwort species, or of taller species such as Sisymbrium or Melilot species (NCC, 1990).		Classify as poor condition	
	Other: Allotments	J112	Low	2	Low	1	n/a	n/a	Low	1	n/a	n/a	Not a priority habitat	Allotments		All alloments included		Classify as poor condition	
	Other: Quarry	I21	Low	2	Low	1	n/a	n/a	Low	1	n/a	n/a	Not a priority habitat	Quarries & gravel pits		Excavations such as gravel, sand or chalk pits and stone quarries should be included in this category.		Classify as poor condition	n/a
	Other: Spoil	I22	Low	2	Low	1	n/a	n/a	Low	1	n/a	n/a	Not a priority habitat	Not a priority habitat		Includes abandoned industrial areas and tips of waste material such as coal mine spoil and slag.		Classify as poor condition	n/a
	Other: Refuse tip	I24	Low	2	Low	1	n/a	n/a	Low	1	n/a	n/a	Not a priority habitat	Not a priority habitat		Rubbish tips, worked landfill sites		Classify as poor condition	n/a
	Other: Introduced shrub	J14	Low	2	Low	1	n/a	n/a	Low	1	n/a	n/a	Not a priority habitat	Not a priority habitat		This is vegetation dominated by shrub species that are not locally native, whether planted or selfsown. Common introduced shrubs include species of box, dog wood, laurel, privet, Rhododendron and snowberry. Formal beds of shrubs such as of Hypericum calycinum, Cotoneaster, heaths and dwarf conifers should be included here.		Classify as poor condition	0-5 years
	Other: Bare ground	J4	Low	2	Low	1	n/a	n/a	Low	1	n/a	n/a	Not a priority habitat	Not a priority habitat					n/a
	Other: Vertical face (correction factor)	n/a	none	0	Low	1	W_in_P	W_in_P	Low	1	W_in_P	W_in_P							
	Other: Living Wall	n/a	Medium-Low	3	Medium	1.5	W_in_P	W_in_P	Low	1	W_in_P	W_in_P							
	Other: Living roof - Extensive	n/a	Low	2	Low	1	W_in_P	W_in_P	Low	1	W_in_P	W_in_P							
	Other: Living roof - Semi-intensive	n/a	Medium-Low	3	Medium	1.5	W_in_P	W_in_P	Low	1	W_in_P	W_in_P							
	Other: Living roof - Intensive	n/a	Low	2	Low	1	W_in_P	W_in_P	Low	1	W_in_P	W_in_P							
	Other: Living roof - Brown	n/a	Medium-Low	3	Low	1	W_in_P	W_in_P	Low	1	W_in_P	W_in_P							
	Other: Living roof - Mosaic	n/a	Medium	4	Medium	1.5	W_in_P	W_in_P	Low	1	W_in_P	W_in_P							
	Linear features																		
	Hedges: Intact hedge	J21	Medium	4	Low	1	W_in_P	W_in_P	Low	1	W_in_P	W_in_P							
	Hedges: Native species rich intact hedge	J211	High	6	Low	1	W_in_P	W_in_P	Low	1	W_in_P	W_in_P							
	Hedges: Hedge with trees	J23	Medium-High	5	Low	1	W_in_P	W_in_P	Low	1	W_in_P	W_in_P							
	Hedges: Native species rich hedge with trees	J231	High	6	Low	1	W_in_P	W_in_P	Low	1	W_in_P	W_in_P							
	Hedges: Defunct hedge	J22	Low	2	n/a	-	W_in_P	W_in_P	n/a	-	W_in_P	W_in_P							
	Hedges: Linear scrub	A21	Medium	4	Low	1	W_in_P	W_in_P	Low	1	W_in_P	W_in_P							
	Hedges: Linear trees	A3	Medium	4	Low	1	W_in_P	W_in_P	Low	1	W_in_P	W_in_P							
	Hedges: Introduced shrub	J14	Low	2	Low	1	W_in_P	W_in_P	Low	1	W_in_P	W_in_P							
	Ditches: Standing water	G1	High	6	Medium	2	W_in_P	W_in_P	Low	1	W_in_P	W_in_P							
	Ditches: Running water	G2	High	6	Medium	2	W_in_P	W_in_P	Low	1	W_in_P	W_in_P							
	Ditches: Dry ditch	J26	Low	2	Low	1	W_in_P	W_in_P	Low	1	W_in_P	W_in_P							
	Boundaries: Fence	J24	None	0	Low	1	W_in_P	W_in_P	Low	1	W_in_P	W_in_P							
	Boundaries: Wall	J25	Low	2	Low	1	W_in_P	W_in_P	Low	1	W_in_P	W_in_P							
	Boundaries: Dry stone wall	J25	Medium	4	Low	1	W_in_P	W_in_P	Low	1	W_in_P	W_in_P							
	Other: Inland cliff	I1	Medium	4	Low	1	W_in_P	W_in_P	Low	1	W_in_P	W_in_P							
	Other: Earth bank	J28	Low	2	Low	1	W_in_P	W_in_P	Low	1	W_in_P	W_in_P							
	Other: Living wall	n/a	Low	2	Low	1	W_in_P	W_in_P	Low	1	W_in_P	W_in_P							

abitats for creation Phase 1 abitat escriptions	abitats for restoration Phase 1 abitat escriptions
Built Environment: Buildings/hardstanding	Woodland: Broad-leaved semi-natural woodland
Built Environment: Gardens (lawn and planting)	Woodland: Broad-leaved plantation
Woodland: Broad-leaved plantation	Woodland: Coniferous semi-natural woodland
Woodland: Coniferous plantation	Woodland: Coniferous plantation
Woodland: Mixed plantation	Woodland: Mixed semi-natural woodland
Woodland: Wet woodland	Woodland: Mixed plantation
Woodland: Dense continuous scrub	Woodland: Wet woodland
Woodland: Scattered scrub	Woodland: Dense continuous scrub
Woodland: Scattered trees	Woodland: Scattered scrub
Woodland: Coniferous parkland	Woodland: Scattered trees
Woodland: Orchard	Woodland: Broad-leaved parkland
Grassland: Semi-improved acidic grassland	Woodland: Coniferous parkland
Grassland: Semi-improved neutral grassland	Woodland: Orchard
Grassland: Semi-improved calcareous grassland	Grassland: Unimproved acidic grassland
Grassland: Marsh / Marshy grassland	Grassland: Semi-improved acidic grassland
Grassland: Dry heath / Acidic grassland mosaic	Grassland: Unimproved neutral grassland
Grassland: Set-aside / Arable field margins	Grassland: Semi-improved neutral grassland
Grassland: Amenity grassland	Grassland: Unimproved calcareous grassland

Distinctiveness	
High	6
Medium-High	5
Medium	4
Medium-Low	3
Low	2
none	0

Condition	
Good	3
Moderate	2
Poor	1

Time	
3 years	1.1
5 years	1.2
10 years	1.4
15 years	1.7
20 years	2
25 years	2.4

Biodiversity Impact Assessment Summary

Derived Locally from the Defra Metric
Version 19.0 (01/04/2018)

Wetland: Standing water	Grassland: Semi-improved calcareous grassland
Wetland: Running water	Grassland: Marsh / Marshy grassland
Wetland: Reedbed	Grassland: Dry heath / Acidic grassland mosaic
Wetland: Sphagnum Bog	Grassland: Set-aside / Arable field margins
Wetland: Acid/neutral flush	Wetland: Standing water
Wetland: Basin Mire	Wetland: Running water
Wetland: Swamp	Wetland: Reedbed
Wetland: Inundation vegetation	Wetland: Sphagnum Bog
Other: Continuous bracken	Wetland: Acid/neutral flush
Other: Tall ruderal	Wetland: Basin Mire
Other: Non-ruderal	Wetland: Swamp
Other: Ephemeral/short perennial	Wetland: Inundation vegetation
Other: Allotments	Other: Continuous bracken
Other: Quarry	Other: Tall ruderal
Other: Spoil	Other: Non-ruderal
Other: Refuse tip	Other: Ephemeral/short perennial
Other: Introduced shrub	Other: Allotments
Other: Bare ground	Other: Bare ground
Other: Living Wall	Other: Living roof - Extensive
Other: Living roof - Extensive	Other: Living roof - Semi-intensive
Other: Living roof - Semi-intensive	Other: Living roof - Intensive
Other: Living roof - Intensive	Other: Living roof - Brown
Other: Living roof - Brown	Other: Living roof Mosaic
Other: Living roof Mosaic	Other: Living Wall

30 years	2.8
32+ years	3

Difficulty	
Very high	10
High	3
Medium	1.5
Low	1
n/a	0

Linear	Linear
Hedges: Intact hedge	Hedges: Intact hedge
Hedges: Native species rich intact hedge	Hedges: Native species rich intact hedge
Hedges: Hedge with trees	Hedges: Hedge with trees
Hedges: Native species rich hedge with trees	Hedges: Native species rich hedge with trees
Hedges: Linear scrub	Hedges: Linear scrub
Hedges: Linear trees	Hedges: Linear trees
Hedges: Introduced shrub	Ditches: Standing water
Ditches: Standing water	Ditches: Running water
Ditches: Running water	Ditches: Dry ditch
Ditches: Dry ditch	Boundaries: Dry stone wall
Boundaries: Fence	Other: Inland cliff
Boundaries: Wall	Other: Earth bank
Boundaries: Dry stone wall	Other: Living wall
Other: Inland cliff	
Other: Earth bank	
Other: Green wall	

Biodiversity Impact Assessment Summary

Derived Locally from the Defra Metric
Version 19.0 (01/04/2018)

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					Woodland					Grassland					Wetland					Other (including Built Gardens)					Built Environment					
		Distinctiveness	Area	Value	High	Medium-High	Medium	Medium-Low	Low	High	Medium-High	Medium	Medium-Low	Low	High	Medium-High	Medium	Medium-Low	Low	High	Medium-High	Medium	Medium-Low	Low	High	Medium-High	Medium	Medium-Low	Low	
			38.70	78.68																										
J4	Other: Bare ground	Low	0.76	1.52																				1.52						
A21	Woodland: Dense continuous scrub	Medium-Low	0.42	1.26				1.26																						
n/a	Built Environment: Buildings/hardstanding	none	0.82	0.00																										
B4	Grassland: Improved grassland	Low	16.60	33.16										33.16																
A132	Woodland: Mixed plantation	Low	14.85	28.64					28.64																					
A22	Woodland: Scattered scrub	Medium	0.42	1.68			1.68																							
B6	Grassland: Poor semi-improved grassland	Medium-Low	4.14	12.42									12.42																	
G1	Wetland: Standing water	High	0.02																											
A22	Woodland: Scattered scrub	Medium	0.64																											
A111	Woodland: Broad-leaved semi-natural woodland	High	0.01																											
n/a	Built Environment: Buildings/hardstanding	none	0.02	0.00																										
	0		0.00																											
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Indirect Impacts				High	Medium-High	Medium	Medium-Low	Low	High	Medium-High	Medium	Medium-Low	Low	High	Medium-High	Medium	Medium-Low	Low	High	Medium-High	Medium	Medium-Low	Low	High	Medium-High	Medium	Medium-Low	Low
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				Woodland					Grassland					Wetland					Other					Built Environment				
Creation	Distinctiveness	Area	Value	High	Medium-High	Medium	Medium-Low	Low	High	Medium-High	Medium	Medium-Low	Low	High	Medium-High	Medium	Medium-Low	Low	High	Medium-High	Medium	Medium-Low	Low	High	Medium-High	Medium	Medium-Low	Low
Grassland: Amenity grassland	Low	0.77	1.40										1.40															
Built Environment: Buildings/hardstanding	none	9.05	0.00																									
Built Environment: Buildings/hardstanding	none	11.96	0.00																									
Woodland: Broad-leaved plantation	Medium	7.35	19.60			19.60																						
Woodland: Scattered scrub	Medium	6.25	44.12			44.12																						
Woodland: Scattered trees	Medium	0.40	1.33			1.33																						
Wetland: Reedbed	High	0.57	8.55											8.55														
Wetland: Standing water	High	1.03	6.87											6.87														
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				Woodland					Grassland					Wetland					Other					Built Environmment				
Enhnacement	Distinctivenes	Area	Value	High	Medium-High	Medium	Medium-Low	Low	High	Medium-High	Medium	Medium-Low	Low	High	Medium-High	Medium	Medium-Low	Low	High	Medium-High	Medium	Medium-Low	Low	High	Medium-High	Medium	Medium-Low	Low
Grassland: Semi-improved neutral grassland	Medium	0.28	0.80								0.80																	
0		0.00																										
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	Loss	Gain		%		
Offset Requirements	78.68	82.67	3.99	-44.90		
Woodland	31.58	65.05	33.47	838.85%		660.00
Grassland	45.58	2.20	-43.38	96.61%	-1087.22%	-855.42

Biodiversity Impact Assessment Summary

Wetland	0.00	15.42	15.42		386.47%	304.07
Other	1.52	0.00	-1.52	3.39%	-38.10%	-29.97
Built Environment	0.00	0.00	0.00			

Biodiversity Impact Assessment Summary

Derived Locally from the Defra Metric
Version 19.0 (01/04/2018)

			38.70	78.68	P_Intensive Crops	P_Traditional crops	P_Livestock	P_Wild foods	P_Fresh water	P_Energy	P_Timber	P_Medical	**Provisioning**	R_Pollination	R_Pest control	R_Species	R_Climate	R_Air quality	R_Flood protection	R_Water purification	R_Soil Erosion	**equlating**	C_Physical	C_Aesthetic	C_Spiritual	C_Intellectual	**Cultural**
		Distinctiveness	Area	Value																							
J4	Other: Bare ground	Low	0.76	1.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.	0.00	0.00	0.00	0.00	0.00	.
A21	Woodland: Dense continuous scrub	Medium-Low	0.42	1.26	0.00	0.00	1.05	0.00	0.00	1.26	0.84	0.21	. 2	1.89	1.47	1.68	1.68	1.26	1.26	1.26	1.26	1. 7	0.84	0.84	0.84	1.26	.9
n/a	Built Environment: Buildings/hardstanding	none	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.	0.00	0.00	0.00	0.00	0.00	.
B4	Grassland: Improved grassland	Low	16.60	33.16	0.00	24.90	83.00	0.00	0.00	0.00	0.00	0.00	13. 9	16.60	16.60	16.60	16.60	16.60	33.20	24.90	41.50	22. 3	16.60	16.60	16.60	16.60	1 .
A132	Woodland: Mixed plantation	Low	14.85	28.64	7.43	0.00	4.46	7.43	11.88	29.70	71.28	0.00	1 . 2	41.58	37.13	41.58	49.01	51.98	51.98	49.01	56.43	7.33	56.43	49.01	34.16	44.55	.
A22	Woodland: Scattered scrub	Medium	0.42	1.68	0.00	0.00	1.05	0.00	0.00	1.26	0.84	0.21	. 2	1.89	1.47	1.68	1.68	1.26	1.26	1.26	1.26	1. 7	0.84	0.84	0.84	1.26	.9
B6	Grassland: Poor semi-improved grassland	Medium-Low	4.14	12.42	0.00	3.31	16.56	1.24	0.00	0.00	0.00	0.00	2.	12.42	10.35	12.42	8.28	8.28	10.35	9.52	13.66	1 .	10.35	10.35	8.28	10.35	9. 3
G1	Welland: Standing water	High	6.87	0.02	0.00	0.00	0.02	0.03	0.10	0.00	0.00	0.01	. 2	0.05	0.04	0.05	0.05	0.04	0.05	0.07	0.01	0.08	0.10	0.10	0.10	0.08	. 9
A22	Woodland: Scattered scrub	Medium	0.64	1.60	0.00	0.00	1.60	0.00	0.00	1.92	1.28	0.32	.	2.88	2.24	2.56	2.56	1.92	1.92	1.92	1.92	2.2	1.28	1.28	1.28	1.92	1.
A111	Woodland: Broad-leaved semi-natural woodland	High	0.01	0.02	0.00	0.00	0.01	0.00	0.00	0.04	0.00	0.00	. 1	0.05	0.04	0.05	0.05	0.05	0.05	0.04	0.05	.	0.05	0.05	0.05	0.05	.
n/a	Built Environment: Buildings/hardstanding	none	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.	0.00	0.00	0.00	0.00	0.00	.
		0	0.00

Biodiversity Impact Assessment Summary

Derived Locally from the Defra Metric
Version 19.0 (01/04/2018)

Index Link	3.61%	1.752242
Insurance Fund	10.00%	
Management Cost	20.00%	

Woodland

Biodiversity mpact Score	Primary habitat re uired in offset	Target habitat distinctiveness		Target habitat condition		Time till target condition		ifficulty of creation		Non-strategic area	ectares of habitat re uired
		istinctiveness	Score	Condition	Score	Time years	Score	ifficulty	Score		
0.00	Woodland: Broad-leaved semi-natural woodland	High	6	Moderate	2	30	2.8	Medium	1.5	2	.

Provider greement Set-up costs	verage oodland creation cost per ha	oodland maintenance cost per ha for 3 years	3 yrs aintenance Cost plus inflation at	Estimated cost of offset	nsurance Contribution (inde lin ed)	anagement Cost (inde lin ed)	Total Cost of ffset Contribution
H	I	£184 x 30 = J	J x 1.75 = K	H + I + K = L	M	N	L N
£7,000	£1,584	£5,520	3.61%		10%	20%	
£0	£0.00	£0.00	£0.00	.	£0.00	£0.00	.
					Cost per ha of habitat created		£0.00
					Cost per unit		£0.00

Grassland

Biodiversity mpact Score	Primary habitat re uired in offset	Target habitat distinctiveness		Target habitat condition		Time till target condition		ifficulty of creation		Non-strategic area	ectares of habitat re uired
		istinctiveness	Score	Condition	Score	Time years	Score	ifficulty	Score		
0.00	Grassland: Semi-improved neutral grassland	Medium	4	Good	3	25	2.4	Medium	1.5	2	.

Provider greement Set-up costs	verage eado creation cost per ha	eado maintenance cost per ha for 3 years	3 yrs aintenance Cost plus inflation at	Estimated cost of offset	nsurance Contribution (inde lin ed)	anagement Cost (inde lin ed)	Total Cost of ffset Contribution
H	I	£227 x 30 = J	J x 1.75 = K	H + I + K = L	M	N	L N
£7,000	£1,686	£6,810	3.61%		10%	20%	
£0	£0.00	£0.00	£0.00	.	£0.00	£0.00	
					Cost per ha of habitat created		£0.00
					Cost per unit		£0.00

Pond Cluster size	4

Werland

Biodiversity mpact Score	Primary habitat re uired in offset	Target habitat distinctiveness		Target habitat condition		Time till target condition		ifficulty of creation		Strategic area	ectares of habitat re uired
		istinctiveness	Score	Condition	Score	Time years	Score	ifficulty	Score		
0.00	Wetland: Standing Water	High	6	Moderate	2	10	1.4	Medium	1.5	2	.

Number of Ponds to be created	Number of Pond clusters to be created	Provider greement Set-up costs	verage Pond creation cost per pond	Pond maintenance cost per pond for 3 years	3 yrs aintenance Cost plus inflation at	Estimated cost of offset	nsurance Contribution (inde lin ed)	anagement Cost (inde lin ed)	Total Cost of ffset Contribution
H	I	J	K	£70 x 30 = L	L x 1.75 = M	I + J + L = N	O	P	N P
L / 0.017ha (av. Pond size)		£7000 per pond cluster	£1,212	£2,100	3.61%		10%	20%	
0	0.00	£0	£0.00	£0.00	£0.00	.	£0.00	£0.00	.
							Cost per pond cluster created		£0.00
							Cost per unit		£0.00

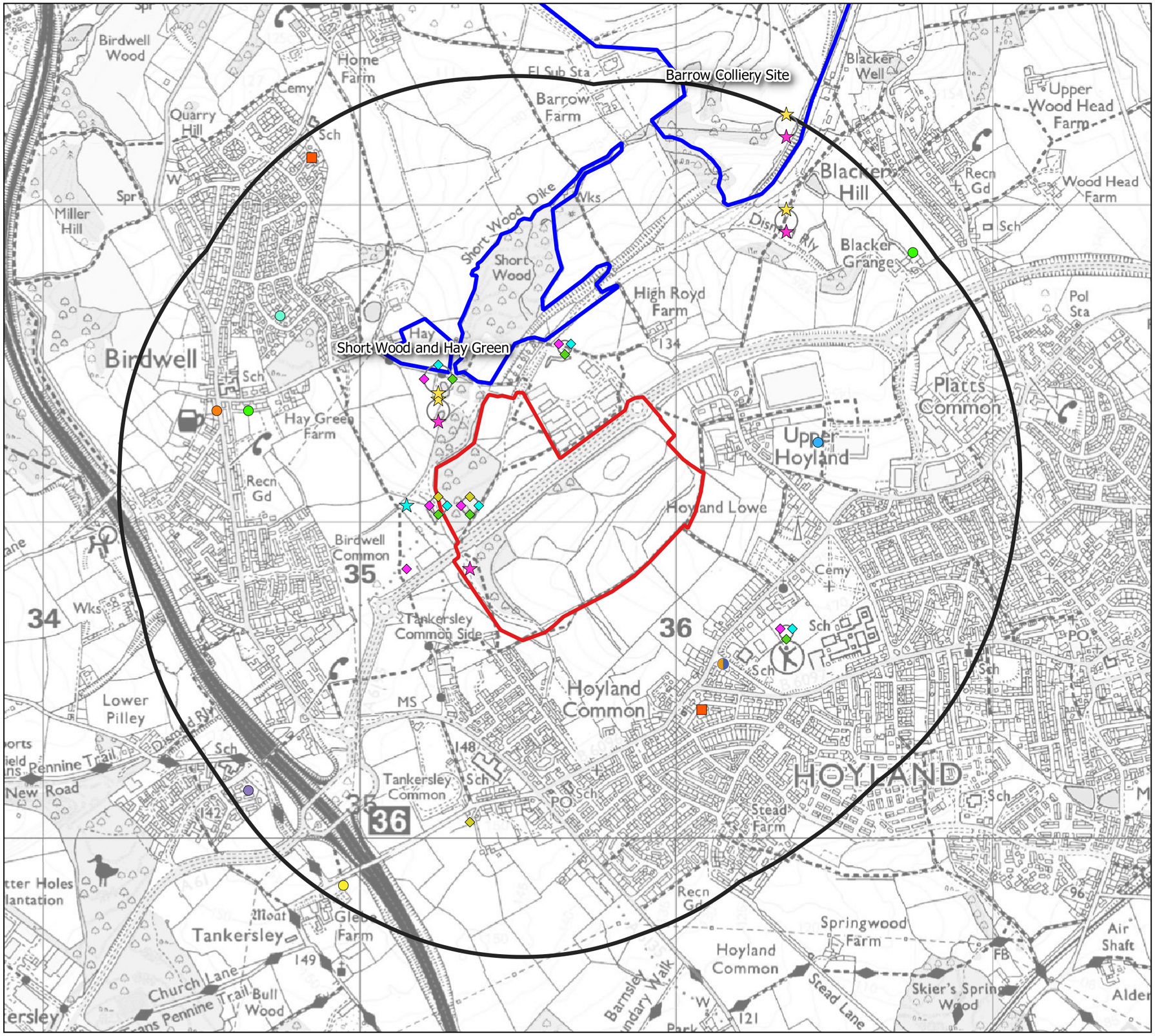
	m2	ha	Plus grassland (x2)
Average HS2 pond	167	0.017	0.034
Stoneleigh otter	200	0.02	
Burton Green	100	0.01	
Burton Green	100	0.01	
Finham Brook ponds	300	0.03	
Finham Brook ponds	200	0.02	
Finham Brook ponds	100	0.01	

Hedgerow

Biodiversity mpact Score	Primary habitat re uired in offset	Target habitat distinctiveness		Target habitat condition		Time till target condition		ifficulty of creation		Strategic rea	m of habitat re uired
		istinctiveness	Score	Condition	Score	Time years	Score	ifficulty	Score		
0.00	species rich hedge with trees	Medium-high	5	Good	3	20	2	Low	1	1	.

0.00 metres

Provider greement Set-up costs	verage edgero creation cost per m	edgero maintenance cost per m for 3 years	3 yrs aintenance Cost plus inflation at	Estimated cost of offset	nsurance Contribution (inde lin ed)	anagement Cost (inde lin ed)	Total Cost of ffset Contribution
H	I	£7270 x 30 = J	J x 1.75 = K	H + I + K = L	M	N	L N
£7,000	£9,400	£218,100	3.61%		10%	20%	
£0	£0.00	£0.00	£0.00	.	£0.00	£0.00	
	£9.40 per metre	£7.27 per metre					
					Cost per ha of habitat created		£0.00
					Cost per unit		£0.00



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Key

- Site Boundary
- 1km Search Radius
- Local Wildlife Sites (LWS)
- Common Frog
- Common Toad
- Great Crested Newt
- Smooth Newt
- Bat sp.
- Brown long-eared
- Common Pipistrelle
- Leisler's
- Pipistrelle sp.
- Soprano pipistrelle
- Whiskered
- Hedgehog
- Dingy Skipper
- Cinnabar
- Small Heath

client
Harworth Group

project
Dearne Valley Parkway, Rockingham, Barnsley - Phase 2 and 3

drawing title
DESIGNATED SITES AND NOTABLE SPECIES PLAN

scale @ A3: 1:12500 | drawn MAF / JDH | issue 22/1/2020

drawing / figure number **Figure 7.2** | rev **6424-E-7.2**

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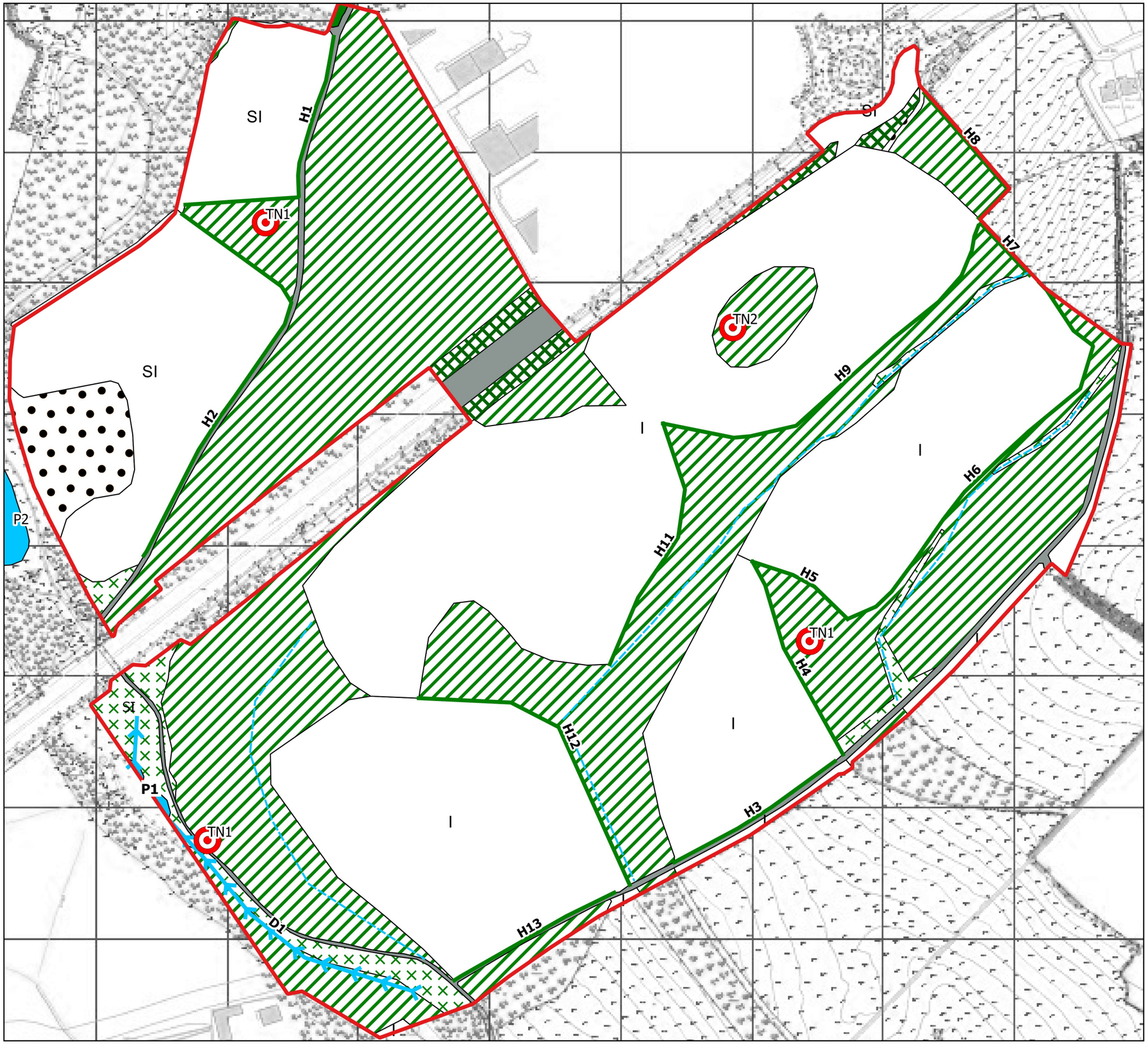
P:\6400\6424\QGIS\Plans\6424-E-01 Consultation Request Plan.qgs



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Key

- Target note (with ref)
- Bare ground
- Broadleaved woodland - plantation
- Built Environment: hardstanding
- I Improved grassland
- SI Poor semi-improved grassland
- Scrub - dense/continuous
- Scrub - scattered
- Standing water

TN1- Schedule 9 invasive non-native Japanese Rose Rosa rugosa.

TN2-3 spikes of Common Spotted-orchid Dactylorhiza fuchsii

client
Harworth Group

project
Dearne Valley Parkway, Rockingham, Barnsley - Phase 2 and 3

drawing title
PHASE 1 HABITAT PLAN

scale @ A3 1:3000 | drawn JDH | issue 28/1/2020

drawing / figure number **Figure 7.3** | rev **6426-E-7.3**

N

0 50 100 150 200 m

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J:\6400\6424\QGIS 2.14 NEW\Plans\Phase 1 plans

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