

ENVIRONMENTAL STATEMENT VOLUME 2: WRITTEN STATEMENT

Land West of Sheffield Road, Hoyland
(Local Plan site ref: ES13)

Newlands Developments Ltd

Job No: 191HA800

DEVELOPMENT & PLANNING | LEEDS

June 2020



**CUSHMAN &
WAKEFIELD**

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Abbreviations

A	
AM	Ante meridiem (before noon)
AADT	Annual Average Daily Traffic
ADMS	Atmospheric Dispersion Modelling Software
AQA	Air Quality Assessment
AQS	Air Quality Strategy
AQAL	Air Quality Assessment Level
AQMA	Air Quality Management Area
ASSI	Areas of Special Scientific Interest
AW	Areas of Ancient Woodland
AOD	Above Ordnance Datum
B	
BMBC	Barnsley Metropolitan Borough Council
BTO	British Trust for Ornithology
BAP	Biodiversity Action Plan
BCT	Bat Conservation Trust
C	
CURED	Calculator Using Realistic Emissions for Diesels
CBC	Common Bird Census
C&W	Cushman & Wakefield
CEMP	Construction Environment Management Plan
CIEEM	Chartered Institute for Ecology and Environmental Management
D	
DMRB	Design Manual for Roads and Bridges
DEFRA	Department for Environment, Food and Rural Affairs
E	

EEC	European Economic Commission
ECCD	European Communities Council Directive
EciA	Ecological Impact Assessment
EIA	Environmental Impact Assessment
EPUK	Environmental Protection UK
ES	Environmental Statement
EPAQS	Expert Panel on Air Quality Standards
F	
FPCR	Ecology and LVIA Consultant
G	
GI	Green Infrastructure
GCN	Great Crested Newts
GPP	Guidance for Pollution Prevention
GLVIA3	Guidelines for Landscape and Visual Impact Assessment 3 rd Edition
H	
HSI	Habitat Suitability Index
HGV	Heavy Goods Vehicle
HEGS	Hedgerow Evaluation and Grading System
I	
IAQM	Institute of Air Quality Management
IEMA	Institute of Environmental Management and Assessment
IEF	Important Ecological Features
L	
LCA	Landscape Character Assessment
LAQM	Local Air Quality Management
LBAP	Local Biodiversity Action Plan
LEMP	Landscape and Ecological Management Plan
LNR	Local Nature Reserves
LWS	Local Wildlife Sites
LVIA	Landscape Visual Impact Assessment
M	
M1	M1 Motorway
MAGIC	Multi-Agency Geographic Information for the Countryside
N	
NA	Natural England
NNR	National Nature Reserves
NCA	National Character Area
NPPF	National Planning Policy Framework
NIA	Nature Improvement Areas
NERC	Natural Resources and Environment Act
NO ₂	Nitrogen Dioxide
NO _x	Oxides of Nitrogen
P	
PM	Post meridiem (after noon)
PM	Particulate Matter
PRoW	Public Right of Way
R	
RDB	Red Data Book (in relation to ecology)
S	

SAC	Special Areas of Conservation
SPI	Species of Principal Importance
SSSI	Sites of Special Scientific Interest
SuDS	Sustainable Drainage System
T	
TA	Transport Assessment
TEMPro	Trip End Model Presentation Program
TP	Travel Plan
U	
UKCP	UK Climate Projections
Z	
ZTV	Zone of Theoretical Visibility

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1. Introduction

- 1.1 This Environmental Statement (ES) has been prepared to support a hybrid planning application for classes B1, B2 and B8 development at land to the West of Sheffield Road, Hoyland. The development will be a hybrid planning application with detailed planning permission sought for access into the site including a new link road between Sheffield Road (A6135) and the Birdwell Roundabout, earthworks to create development platforms and approval for a 31,571sqm distribution unit (Hermes) and associated parking, internal access roads, drainage and landscaping and outline planning permission for up to 71,515sqm of employment land as identified on drawing 4400-001 P25 and the illustrative Masterplan (ref: 9295-L-103B). A full scheme description is provided at Chapter 2 of this ES. The application site comprises 53.42 hectares of land (Barnsley Local Plan sites ES13), illustrated on the site location plan at appendix A.
- 1.2 The hybrid application includes an illustrative masterplan, constraints plan, parameters plans, a Design and Access Statement and supporting technical reports. This documentation is referenced through the ES and appended where necessary. The scheme to be assessed through this ES is identified by the parameters plan and an Illustrative Masterplan (ref 9295-L-103B – appendix B). The ES will also consider the cumulative impact of the Hoyland West Masterplan area (identified in Figure 2.1 page 6).

Requirement for EIA

- 1.1 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.
- 1.2 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)¹. Accordingly, a screening letter was prepared to identify if there were likely to be any significant environmental effects. As part of this process, Barnsley Metropolitan Borough Council (BMBC) identified a need to include the Hoyland West Masterplan site (identified at Appendix C) as part of the screening process. A screening letter was duly prepared and submitted to BMBC on 7th April 2020 (Appendix D). As part of the screening process it transpired that the development, when combined with the Hoyland West Masterplan area, would constitute EIA development and would therefore require an ES. The Council has concurred with this view (BMBC Screening Response dated 20th May 2020 – Appendix E).
- 1.3 A Scoping Report was submitted to BMBC on 29th May 2020 (Appendix F).

ES Structure

- 1.4 The ES includes the information as required under Schedule 4 Part 2 of the Regulations, with the ES prepared by an experienced consultancy team.

¹ (i) The development exceeds 0.5 hectares.

- 1.5 This ES presents the findings of the EIA. It follows current government guidance and includes the following sections:
- Volume 1 - Non Technical Summary
 - Volume 2 - Written Statement
 - Volume 3 - Appendices
- 1.3 The remainder of this ES is arranged as follows:
- Section 2 - Project Description;
 - Section 3 - Need and Alternatives Considered;
 - Section 4 - Environmental Assessment Methodology;
 - Section 5 - Air Quality;
 - Section 6 - Traffic Movements;
 - Section 7 - Ecology and Associated Loss of Habitat, and;
 - Section 8 - Landscape and Visual Impact Assessment.
- 1.6 The above provides a list of the main aspects of the development likely to have a significant impact on the Environment. These matters have been agreed with BMBC. Each chapter of the document conforms to a consistent approach within the document (explained in detail in Chapter 4).

2. Project Description

Background (surrounding area)

- 2.1 The application site is situated within the Hoyland area of Barnsley adjacent to Junction 36 of the M1 to the west of Sheffield Road. Hoyland is a mix of residential and industrial development. Much of the Hoyland area comprises sites allocated for development within the Barnsley Local Plan (adopted January 2019). The application site is part of a wider Local Plan allocation for employment land (Barnsley Local Plan site ES13 – see figure 2.1 below). BMBC has identified three key development areas within Hoyland – Hoyland West, Hoyland North and Hoyland South. Each of these areas requires a Masterplan Framework to be approved before planning applications can be determined. The application site is within Hoyland West. The Hoyland West Masterplan Framework has been prepared in tandem with this planning application. It is anticipated that the Hoyland West Masterplan will be adopted in September 2020. The Masterplan Framework for Hoyland North was adopted by BMBC in December 2019. It is understood that the Framework for Hoyland South is currently being prepared.

Site Location

- 2.2 The proposed application site includes land west of Sheffield Road, in Hoyland, Barnsley (see Site Location Plan at appendix A). The site is adjacent to the M1 Motorway and represents the first phase of the Hoyland West Masterplan Area.

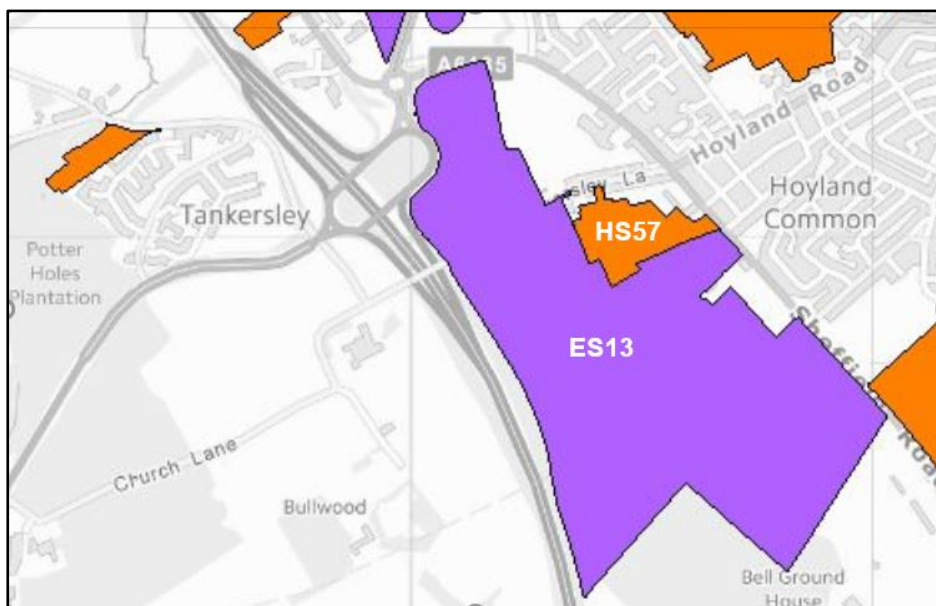


Figure 2.1: Extract of Local Plan Proposals Map.

The Site

- 2.3 The total area of the application site is 53.42 hectares. From the centre of the site, ground levels slope down towards the southeast, however, the northern half of the site is gently sloping/undulating, varying between approximately 140m and 150m.
- 2.4 The site will be accessed via a new access road from Birdwell Roundabout at Junction 36 of the M1. A full topographical survey has been undertaken for the sites which has been used to inform the contour details for the proposed development.

Site History

- 2.5 The site is part of a former colliery and is currently vacant. The site is allocated for employment use within the Barnsley Local Plan² as part of a wider development allocation - site ES13. The majority of the site is currently in agricultural use. A small part of the application site incorporates the Rockingham Sports Facility and specifically the football pitch and archery (this will be relocated as part of the wider Hoyland West Masterplan proposals).
- 2.6 Site ES13 is within the Hoyland West Masterplan area (see figure 2.1, p6). The Hoyland West Masterplan Framework also includes site HS57 (allocated for residential development in the adopted Barnsley Local Plan). The site specific policies for Hoyland West require a Masterplan for each area to be prepared and approved prior to the consideration of detailed proposals. The Hoyland West Masterplan Framework has been prepared concurrently with this application and is due to be adopted September 2020. It has been agreed with BMBC that the ES prepared for this application will include a cumulative assessment of the Hoyland West Masterplan sites³.

Cumulative Assessment

- 2.7 The illustrative masterplan for site ES13 are included at appendix B. At the current time the development (including the cumulative Hoyland West Masterplan development is as follows:

Sites	Site area (hectares)	Proposed use
Application Site		
ES13	53.42 ⁴	Use Class B1/B2/B8
Cumulative Site		
ES13	1.82	Use Class B1/B2/B8
HS57	3.2	101 dwellings
Overall Total	58.44	

Table 2.1: Schedule of sites

Project Description

- 2.8 It is proposed to submit a hybrid planning application with detailed planning permission sought for a new distribution centre (use class B8), drainage infrastructure, new link road linking with the Hoyland South Masterplan area and Birdwell roundabout, associated earthworks and outline planning permission for (71,515sqm) of employment uses (use class B1/B2/B8). In addition, the Environmental Statement (ES) will also consider the cumulative impacts of the Hoyland West Masterplan land.
- 2.9 The description of development is as follows:

Hybrid planning application for a development of employment uses (B1, B2 and B8), new link road, associated works including provision of internal access roads, drainage and landscaping

1. Outline with all matter reserved apart from means of access for up to 71,515 sq.m of employment uses (B1, B2, B8).

² Adopted January 2019

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

⁴ Figure includes attenuation pond.

2. Full application for 31,571 sq.m of B8, new link road including new roundabout to link with Hoyland south Masterplan Area (Local Plan references HS68, HS65, HS61, HS58, HS6, SL5).

Construction Stage and Management

- 2.10 The full application element of the proposals will be developed first. This will involve earthworks to create development platforms, drainage infrastructure, the new link road linking to Birdwell roundabout and the Hoyland South Masterplan area and the new distribution centre for Hermes.
- 2.11 The current programme would see the commencement of construction on the site from January 2021, allowing for essential earthworks and the access points. It is anticipated that work on the employment distribution centre would begin spring 2021. The broad programme for development is outlined below:

Timescales	Milestone
June 2020	Hybrid Planning Application Submitted to BMBC
September 2020	13 week determination period.
September 2020	Committee Decision Issued.
September 2020	Section 278 approval for highway works.
January 2021	Start on site.
September 2022	Hermes facility opens.

Table 2:2: Indicative timescales for development

- 2.12 The above programme is based on Hermes delivery programme and may be adjusted depending on progress with the application, Section 106 Legal Agreement and market conditions.

Description of the Construction Process

- 2.13 The main elements of the construction process for the detailed application are as follows:
- Vegetation clearance;
 - Site earthworks to create development platforms and drainage;
 - Construction of access points;
 - Construction of link road and;
 - Construction of Hermes facility.
- 2.14 The main elements for the construction process for the outline application are as follows:
- Construction of employment units to create up to 71,515 sq.m of employment uses (B1, B2, B8).
 - Creation of landscaped areas (including replacement planting and biodiversity offsetting).
- 2.15 The tender process for the appointment of the contractors for the road and earthworks is underway and the preferred contractor has been appointed. This will enable time to fully brief the contractor ahead of work beginning in January 2021.

2.16 It is intended that construction scheme will be registered as part of the considerate contractors scheme. Construction site impacts will be carefully monitored. A Construction Environment Management Plan (CEMP) and a Landsape and Ecological Management Plan (LEMP) are in the process of being prepared for the site.

2.17 These management plans are likely to include the following requirements:

- Prepare a detailed construction programme.
- Prepare site specific method statements and control documents.
- Maintain uninterrupted access to nearby residential and commercial properties.
- Details of access by heavy goods vehicles;
- Details of loading or unloading of plant and materials;

Construction working hours

2.18 Site working hours will largely be confined to 7-7pm weekdays and 7-4pm on Saturdays. There will be no working on Sundays or bank holidays (notwithstanding the works to the highway, which will need to take place at less busy times – likely evenings or night).

Operational Stage and Development Parameters

2.19 The illustrative masterplan (appendix B) and parameters plans establish the structural elements of the outline proposals against which the EIA has been prepared. A parameters plan has also been prepared (appendix G) which provides details of indicative building heights. A breakdown of the component elements of the scheme is included below:

Unit	Floorspace (sqm)
Detailed Application	
Hermes distribution centre	31,571
Outline Application	
Plot 2	48,755
Plot 3	22,760
Total	71,515
Overall Total	103,086

Table 2.3: Indicative floorspace details.

All units are for employment use – use class B1/B2/B8

2.20 The development proposals represent the first phase of the Hoyland West development and will generate up to 2,000 jobs. The scheme will deliver employment space on sites allocated in the recently adopted Local Plan. The Hoyland West Masterplan Framework will also guide development at the site.

2.21 The main employment unit has an identified end user (Hermes). The other proposed employment units have been grouped to be attractive to the market. It is known that there is strong demand for employment development in this location, however, the rate of delivery will be informed by ongoing discussions with the commercial sector to inform the respective reserved matters applications.

- 2.22 The associated landscaping and infrastructure improvements will ensure that the development delivers a high quality, attractive scheme.

Mitigation Measures

- 2.23 The collaborative approach towards developing the Masterplan has led to a number of mitigation measures which have been applied as part of the evolution of the development. In addition a Construction Environment Management Plan (CEMP) and a Landscape and Ecological Management Plan (LEMP) are in the process of being prepared for the site and will include management and mitigation measures. Table 2.4 below includes a summary of the key mitigation measures for the key areas within the ES.

ES Topic Area	Known Issue	Proposed Mitigation Measures
Highways	Increased Traffic Movement	Travel Plan for application proposals.
Air Quality	Cumulative Air Quality Impact.	Travel Plans to promote and facilitate sustainable travel and thereby reduce vehicle movements.
Air Quality	Dust from construction activity	Works to be undertaken in accordance with a Construction Environment Management Plan
Landscape and Visual Impact	Visual impact on public views for the application site and cumulatively with the Hoyland West Masterplan sites.	Landscape/planting scheme to include perimeter trees/hedges where appropriate.
Landscape and Visual Impact	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. Council has confirmed this is sufficient as part of the Scoping Process ⁵ . See LVIA section.
Ecology	Loss of trees and hedgerows and some semi improved grassland areas for the application site and cumulatively with the Hoyland North Masterplan sites.	Landscape/planting scheme to include new native scrub/trees/hedges and grassland. Retained tree protection measures.
Ecology	Loss of habitat and reduction in biodiversity for the application site and cumulatively with the 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.

⁵ Email from County Archaeologist (Andrew Lines) dated – 19th December 2019.

		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.
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Table 2.4: Proposed Mitigation Measures.

3. Need and Alternatives Considered

3.1 The 2017 EIA Regulations require an ES to provide:

‘A description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.’⁶

Reasonable Alternatives

Location

3.2 The application site is part of a wider allocation for employment development (use classes B1, B2 and B8) within the Barnsley Local Plan (site ref: ES13). As part of the examination process BMBC conducted a Sustainability Appraisal and provided background evidence to support the draft allocations including an Employment Land Review. The Employment Land Review demonstrated the amount of employment land required in the Local Plan to enable Barnsley Council to deliver the levels of economic growth within the plan period. The application sites are instrumental to that growth. As stated, part of the planning application site (ES13) is within the Hoyland West Masterplan area. The proposals represent the first phase of the Hoyland West Masterplan development.

3.3 The adopted Barnsley Local Plan has identified a range of employment sites (both in the Hoyland area) and throughout Barnsley to meet employment needs through the plan period. Whilst there may be other unallocated sites with the potential for employment use in Barnsley, BMBC would be unable to consider these ahead of allocated sites (as BMBC is reliant on these to meet its targets for economic growth). Similarly, whilst there may be other sites currently in employment use which are vacant or available these sites are unlikely to be of a comparable size to the proposed scheme (which is 53.42 hectares in total) or in such a suitable location, close to the main highway network (i.e. Junction 36 of the M1) and close to other existing employment uses (i.e. the Hoyland North area is close to the site to the north). The proposals benefit from an identified end user (Hermes). In searching for a location for the Hermes facility Newlands Developments Ltd undertook an extensive site search. The application site was chosen as Hermes preferred site based on the reasons described above. It is therefore considered that the proposed development is within a highly suitable location.

Development Design

3.4 The design of the development proposals has evolved through discussions with BMBC and through public consultation. Newlands Developments Ltd worked with BMBC and Hoyland Developments to prepare the Hoyland West Masterplan Framework. The development proposals for the application sites evolved in tandem with this process and were consulted upon as part of the formal consultation events held from 7th May 2020 to 18th June 2020. The consultation boards included indicative layout details for the application site together with suggested access arrangements to service site HS57 and also the future operation of Tankersley Lane. Three development options were considered as part of the consultation for the operation of Tankersley Lane (see Appendix H – Presentation boards). The public consultation process and boards also explained the evolution of the design in terms of scale

⁶ Schedule 4 (Part 2) of the 2017 EIA Regulations.

and building heights. A parameters plan identifying the proposed building heights is included at Appendix G.

- 3.5 In tandem with the Hoyland North Masterplan work Newlands Developments Ltd has worked closely with BMBC to design the illustrative masterplan for the site. A number of alternative options for access were considered before it was agreed that a new access from Birdwell Roundabout would be provided, which will also link to the Hoyland South scheme.

Size and Scale

- 3.6 The size and scale of the detailed scheme for the Hermes facility has been carefully considered, designed in the context of the site constraints and also designed to the specific requirements of the end user (Hermes). The outline proposals for employment use have also been designed with regard to the site context and in respect of market requirements. Subsequent reserved matters applications will provide specific detail of the size and scale of the units for Plots 2 and 3, however, the Illustrative Masterplan demonstrates that a scheme of 71,515sqm can be achieved at these plots. The design proposals were presented to BMBC's Design Panel on 2nd April 2020 and were well received.

Reasons for Site Selection

- 3.7 The application site has been selected as it is allocated for employment use in the adopted Barnsley Local Plan and therefore are an instrumental part of the Council's long term strategy for economic growth. The application site is former colliery land (now vacant) and is close to major transport networks (Junction 36 of M1). The proposals also represent the first phase of the delivery of the Hoyland West Masterplan site.

Preferred Option

- 3.8 The preferred option shown on the illustrative Masterplan at appendix B has culminated in a scheme which balances the need to protect and enhance key ecological features of the site (i.e. biodiversity net gain – see chapter 7), the need to protect and enhance views into and out of the site (see Chapter 8 Landscape and Visual Impact), the need to ensure that the proposals do not have a negative impact on air quality (Chapter 5), together with the need to provide a high quality employment development. As such, the final Illustrative Masterplan for the site has given adequate safeguards to reflect the policy requirements of Policy ES13 and guidance in the draft Hoyland West Masterplan Framework.
- 3.9 Overall, the development of the Masterplan has been collaborative and thorough, presenting a strategy which offers the most sustainable outcomes and provides mitigation as part of the development proposals.

4. Environmental Assessment Methodology

- 4.1 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. 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)⁷. 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 West Masterplan sites (identified in Table 2.1, page 6) as part of the screening process. A screening letter was duly prepared and submitted to BMBC on 7th April 2020. As part of the screening process it transpired that the development, when combined with the Hoyland West Masterplan sites, would constitute EIA development and would therefore require an ES. The Council has concurred with this view.

The Scope of the Environmental Assessment

- 4.2 A Scoping Report was submitted to BMBC on 29th May 2020 (Appendix F). The purpose of the Scoping Report was to establish, through consultation those matters which the ES should cover and to identify the process in which the ES would assess and report the findings of those assessments. The Scoping Report also identifies those matters which have been scoped out of the ES.
- 4.3 BMBC's Scoping Opinion has not yet been received, however, it is understood from meetings with the Council that they have agreed the following key topic areas for the ES as detailed below:
- Air Quality;
 - Traffic Movements;
 - Ecology and Associated Loss of Habitat;
 - Landscape and Visual Impact.
- 4.4 The following matters are scoped out of the ES. All of these matters are addressed as part of the planning application to which this ES relates.
- Geotechnical/Ground Conditions;
 - Flood Risk and Drainage;
 - Noise;
 - Materials (Soil and Waste);
 - Social/Economic;
 - Material Assets (Archaeology);
 - Planning Policy Context, and;

⁷ (i) The development exceeds 0.5 hectares.

- Climate Change.

Study Team

4.5 Cushman & Wakefield coordinated the ES submission, details of the authors of the key topic chapters are as follows:

- Chapters 1-4: Introduction, Site Description, Need and Alternatives, Methodology (Cushman & Wakefield);
- Chapter 5: Air Quality (Vanguardia)
- Chapter 6: Traffic Management (Fore Consulting)
- Chapter 7: Ecology and Associated Loss of Habitat (FPCR)
- Chapter 8: Landscape and Visual Impact (FPCR).

Methodology

4.6 Each environmental topic forms a separate chapter of the ES. For each topic the following criteria are addressed:

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

Legislation Policy and Guidance

4.7 Each chapter of the ES refers to the relevant legal requirements and policies related to their topic area.

Methodology and Assessment Criteria

4.8 Each topic chapter will provide details of the methodology for baseline data collection and the assessment of effects. Each identified environmental topic is authored by a specialist in that area. The identification and evaluation of effects have taken into account topic specific guidance where available and applicable.

Baseline Conditions

4.9 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 site (and within the wider cumulative area) form the basis of the assessment.

- 4.10 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)⁸, which provides information on changes in climate for the UK.

Identification of likely effects

- 4.11 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.
- 4.12 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.
- 4.13 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 magnitude⁹. 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 are divided into those occurring during the construction phase and those occurring during operation.

Significance of Effects

- 4.14 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.
- 4.15 Levels of significance to be used in the assessment are detailed below (in descending order):
- Major – very important considerations, material in the decision making process;
 - Moderate – important decision making factors;
 - Minor – local factors, unlikely to be critical in the decision making process, and;
 - Negligible – no effect or the effect would be beneath the levels of perception.
- 4.16 These significance levels are defined for each topic within the methodology sections of each chapter.

Cumulative Effects

- 4.17 In accordance with BMBC's Screening Opinion, the cumulative effects of the proposed development in conjunction with the Hoyland West Masterplan sites (see table 2.1, page 6) are considered as part of each topic chapter.

⁸ UK Climate Projections is a climate analysis tool that forms part of the Met Office Hadley Centre Climate Programme.

⁹ The assessment of magnitude impact is likely to include the extent of the impact, duration, frequency and reversibility.

Mitigation and Monitoring Measures

- 4.18 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*¹⁰’.
- 4.19 The development of mitigation measures have been developed throughout the EIA process in response to the findings of initial assessments. The proposed development includes a number of mitigation measures (detailed at table 2.4, pages 10 and 11) 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.
- 4.20 The topic chapters 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.

¹⁰ Part 5, Section 18, Paragraph 3(b) of 2017 EIA Regulations

5. Air Quality

Introduction

- 5.1 This chapter of the ES has been produced by Vanguardia and sets out the air quality impacts associated with the Proposed development on Land West of Sheffield Road, Hoyland.
- 5.2 During the site clearance and construction activities, temporary impacts may arise from the emission of air pollutants and dust. During both the construction and occupation phases, vehicular traffic and emissions from stationary plant associated with the Proposed development has the potential to lead to changes in the total air quality concentrations and the level of exposure for both human and ecological receptors.
- 5.3 The assessment will focus on air pollutants that are likely to arise from the construction and occupation phases of the Proposed Development. These pollutants are oxides of nitrogen (NO_x), nitrogen dioxide (NO₂), particulate matter (PM₁₀ and PM_{2.5}) and dust for human and ecological receptors.
- 5.4 This chapter is supported by the Air Quality Assessment (AQA) dated June 2020, which has also been prepared by Vanguardia Ltd and is included at Appendix I.
- 5.5 The scope and methodology for the main AQA has been discussed and agreed with BMBC (Appendix I).

Methodology and Assessment Criteria

EU Legislative Context

- 5.6 The following EU legislation is relevant to the Development:
- Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe (which consolidates:
 - Directive 1999/30/EC;
 - Directive 2000/69/EC; and
 - Directive 2002/3/EC.
 - Directive 2004/107/EC of the European Parliament and of the Council of 15 December 2004 relating to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air.

UK Legislative Context

- 5.7 The Government's policy on air quality within the UK is set out in the Air Quality Strategy for England, Scotland, Wales and Northern Ireland (AQS). The AQS provides a framework for reducing air pollution in the UK with the aim of meeting the requirements of European Union Legislation.
- 5.8 The AQS sets out national health-based standards and objectives for nine key air pollutants to protect human health and ecosystems. These pollutants are benzene, 1-3 butadiene, carbon

monoxide, lead, nitrogen dioxide, ozone, particulate matter, sulphur dioxide and polycyclic aromatic hydrocarbons.

- 5.9 The pollutant standards relate to ambient pollutant concentrations in air, based on medical and scientific evidence regarding how each pollutant affects human health. Pollutant objectives are the future dates by which each standard is to be achieved, considering economic considerations, practical and technical feasibility.
- 5.10 The air quality objectives are managed through the Local Air Quality Management, (LAQM) regime, which is defined within the Air Quality (England) Regulations 2000, (SI 928), The Air Quality (England) (Amendment) Regulations 2002, (SI 3043). Table 5.1 below shows the targets and limits that are permitted for protection of human health, (where applicable) which are relevant to this assessment. Table 5.2 shows the targets and limits that are permitted for protection of ecosystems and vegetation, (where applicable) which are relevant to this assessment.

Pollutant	Time Period	Objective
Nitrogen Dioxide (NO ₂)	1-hour Mean	200 µg/m ³ not to be exceeded more than 18 times a year
	Annual Mean	40 µg/m ³
Fine Particles (PM ₁₀)	24-hour Mean	50 µg/m ³ not to be exceeded more than 35 times a year
	Annual Mean	40 µg/m ³
Fine Particles (PM _{2.5})	Annual Mean	25 µg/m ³

Table 5.1: Human Health Air Quality Standards, Objectives, Limit and Target Values

Pollutant	Time Period	Critical Level
Nitrogen Oxides (expressed as NO ₂)	Annual Mean	30 µg/m ³
	24-Hour Mean	75 µg/m ³

Table 5.2: Vegetation and Ecosystem Critical Levels

Air Quality Regulations

- 5.11 Many of the air quality objectives set out in the AQS have been made statutory in England through the Air Quality (England) Regulations 2000 (Air Quality Regulations) as amended by the Air Quality (England) (Amendment) Regulations 2002 for the purpose of Local Air Quality Management (LAQM).
- 5.12 The Air Quality Regulations stipulate that likely exceedances of the AQS objectives are assessed in relation to:

“...the quality of air at locations which are situated outside of buildings or other natural or man-made structures, above or below ground, and where members of the public are regularly present...”

Environmental Protection Act 1995

- 5.13 Part IV of the Environment Act 1995 requires Local Authorities to regularly and systematically review and assess air quality within their boundaries against a series of objectives and appraise development and transport plans against these assessments. Where an air quality objective is unlikely to be met, the local authority must designate an Air Quality Management Area (AQMA) and draw up an Air Quality Action Plan setting out the measures it intends to introduce in pursuit of the objectives within its AQMA.

Planning Policy and Guidance

5.14 The following national, local planning policies and guidance documents were utilised as part of the assessment:

- Ministry for Housing, Communities and Local Government (2019) National Planning Policy Framework;
- Ministry for Housing, Communities and Local Government (2019) National Planning Practice Guidance;
- Defra (2017) UK plan for tackling roadside nitrogen dioxide concentrations;
- DEFRA (2018) 'LAQM Technical Guidance LAQM.TG(16);
- Defra (2019) Clean Air Strategy;
- Highways Agency (2007). Design Manual for Roads and Bridges (DMRB), Volume 11: Environmental Assessment, Section 3: Environmental Assessment Techniques, Part 1, HA 207/07;
- Barnsley Metropolitan Borough Council (2019) Local Plan;
- Environmental Protection UK & Institute of Air Quality Management (EPUK & IAQM) (2017) Land-Use Planning & Development Control: Planning for Air Quality;
- Institute of Air Quality Management (EPUK & IAQM) (2020) A Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites;
- Institute of Air Quality Management (2014) Guidance on the Assessment of Dust from Demolition and Construction;
- Barnsley Metropolitan Borough Council (2018) Air Quality and Emissions Good Practice Planning Guidance; and
- Multi-Agency Geographic Information for the Countryside (MAGIC) (<http://magic.defra.gov.uk/>);

Baseline Data Collection

Desktop Study

5.15 The existing baseline concentrations of oxides of nitrogen, (NO_x) nitrogen dioxide (NO₂), and particulate matter (PM₁₀ & PM_{2.5}), in the vicinity of the site have been assessed using the BMBC air quality review and assessment reports and monitoring data. The Defra background mapping website has also been utilised to provide background oxides of Nitrogen (NO_x), nitrogen dioxide, (NO₂) and particulate matter, (PM₁₀ & PM_{2.5}) concentrations. The website has mapped background concentrations at a resolution 1x1km for the whole of the UK. Estimated concentrations are available for all years between 2017 and 2030.

5.16 To identify any sensitive ecological designated sites, a review of the Defra Magic Map website has been undertaken.

- 5.17 A desktop study has been undertaken based upon local mapping and the Environment Agency and Local Authority Permitting websites to ascertain if any potential odorous sources are within the vicinity of the Site.

Assessment Methodology

Construction Phase Dust Assessment Methodology

- 5.18 To assess the potential impacts associated with dust (PM₁₀) release during the construction phase of the Proposed Development, and to determine any required mitigation measures, an assessment based upon IAQM (2014) guidance has been undertaken.
- 5.19 The criteria developed by IAQM (2014), divides the activities on construction sites into four different types to assess their different level of impacts upon receptors. These are:
- Demolition;
 - Earthworks;
 - Construction; and
 - Trackout
- 5.20 The risk of dust effects, (Low, Medium or High) are determined by the scale (magnitude) and nature of the works being undertaken, along with the distance to the receptor.
- 5.21 The full methodology is set out in Appendix I, and the full assessment of the Proposed development dust assessment, in isolation of any ongoing works or committed developments, has been undertaken is summarised in the, *Identification of Likely Effects* section of this ES Chapter, with no allowance for inherent mitigation set out in *Mitigation and Monitoring Measures* of this ES Chapter and Appendix I.

Construction Phase Vehicular Impact Methodology

- 5.22 The number of daily vehicular movements associated with the construction phase of the proposed development will vary on a daily basis, depending upon the construction activity being undertaken at the time. Therefore, reasonable estimates have been provided by Fore Consulting Ltd.
- 5.23 The traffic estimates for both the construction and operational phases, provided by Fore Consulting Ltd have been compared to the EPUK & IAQM (2017) criterion thresholds, set out in Appendix I (and summarised in paragraph 5.50), to determine if a full impact assessment is required, and the potential cumulative impacts of the committed developments.

Air Quality Model

- 5.24 Air quality at specified receptor locations have been predicted using the ADMS-Roads (v5.0.0.1) dispersion modelling software which is recognised as the leading air pollution modelling packages in the UK. The model uses advanced algorithms for the height-dependence of wind speed, turbulence and stability to produce improved predictions of air pollutant concentrations. It can predict long-term and short-term concentrations, including percentile concentrations. The use of the ADMS-Roads model was agreed with the air quality Environment Health Officer at BMBC.

- 5.25 The model requires the user to provide various input data, including emissions from each section of road and the road characteristics (including road width, where applicable), and meteorological data. To note, the meteorological data used within the model has been taken from Emley Moor for 2019.
- 5.26 The model has been utilised to predict concentrations of oxides of nitrogen, (NO_x) and particulate matter, (PM₁₀ & PM_{2.5}), based upon vehicle flow, composition, and speed. The oxides of nitrogen, (NO_x) concentrations have been post processed to derive nitrogen dioxide, (NO₂) concentrations using the NO_x to NO₂ calculator (v7.1) available on the Defra air quality website.
- 5.27 Further details on the model uncertainty, and the verification process can be found in Appendix I.

Emission Factors

- 5.28 The most recently available emission factor tool kit (Version 9.0), released by Defra in May 2019, have been used to predict the traffic related emissions in 2019, 2020, 2021 and 2029.
- 5.29 In addition to the set of 'official' predictions, a sensitivity test has also been carried out for nitrogen dioxide, (NO₂) that involves assuming much higher nitrogen oxide (NO_x) emissions from certain vehicles than have been predicted within the Defra emission factors, using the 'Calculator Using Realistic Emissions for Diesels', (CURED V3A) tool. The aim of this is to address the potential under-performance of emissions control technology on modern diesel vehicles.
- 5.30 Along with these emission factors, local background concentrations of oxides of nitrogen, (NO_x) nitrogen dioxide, (NO₂) and particulate matter, (PM₁₀ & PM_{2.5}), have been taken from the Defra 2017 background maps for 2019, 2020, 2021 and 2029. The CURED, (V3A) tool has been utilised to derive a worst-case background concentration of nitrogen dioxide, (NO₂) for the sensitivity assessment.

Modelling Scenarios

- 5.31 The traffic data used to undertake the assessment has been provided by Fore Consulting Ltd for both the construction and operational phases, for the following scenarios:
- Scenario 1 – 2019 Baseline (Verification);
 - Scenario 2 – 2020 Baseline;
 - Scenario 3 – 2021 Baseline;
 - Scenario 4 – 2029 Baseline;
 - Scenario 5 – 2020 Baseline + Proposed development Construction Traffic (Infrastructure);
 - Scenario 6 – 2021 Baseline + Proposed development Construction Traffic (Buildings); and
 - Scenario 7 – 2029 Baseline + Proposed development Operational Traffic.
- 5.32 Vanguardia have been advised that both committed developments and the TEMPro (Trip End Model Presentation Program) has been utilised to growth up the baseline and development scenarios.

5.33 In order to assess the impacts associated with the proposed development on human and ecological receptors, the following scenarios have been compared:

- **Test 1** - Scenario 5 – 2020 Baseline + Construction Traffic (Infrastructure) vs Scenario 2 – 2020 Baseline;
- **Test 2** - Scenario 6 – 2021 Baseline + Construction Traffic (Buildings) vs Scenario 3 – 2021 Baseline; and
- **Test 3** - Scenario 7 – 2029 Baseline + Operational Traffic vs Scenario 4 – 2021 Baseline

Sensitive Human Receptors

5.34 The concentrations of nitrogen dioxide, (NO₂) and particulate matter, (PM₁₀ & PM_{2.5}) have been predicted at several locations along the local highway network, where the traffic data indicates changes in traffic flows.

5.35 When selecting the receptor locations, careful consideration has been made of junction locations, and where several highway links combine.

5.36 To note, according to LAQM.TG(16), air quality standards should only apply to locations where members of the public may be reasonably likely to be exposed to air pollution for the duration of the relevant limit value. As such, existing residential locations surrounding the site have been selected to inform the risk assessment in terms of the relevant annual mean exposure.

5.37 The modelling locations are set out in Table 5.3 (p27) and illustrated in Figure 5.1 below.

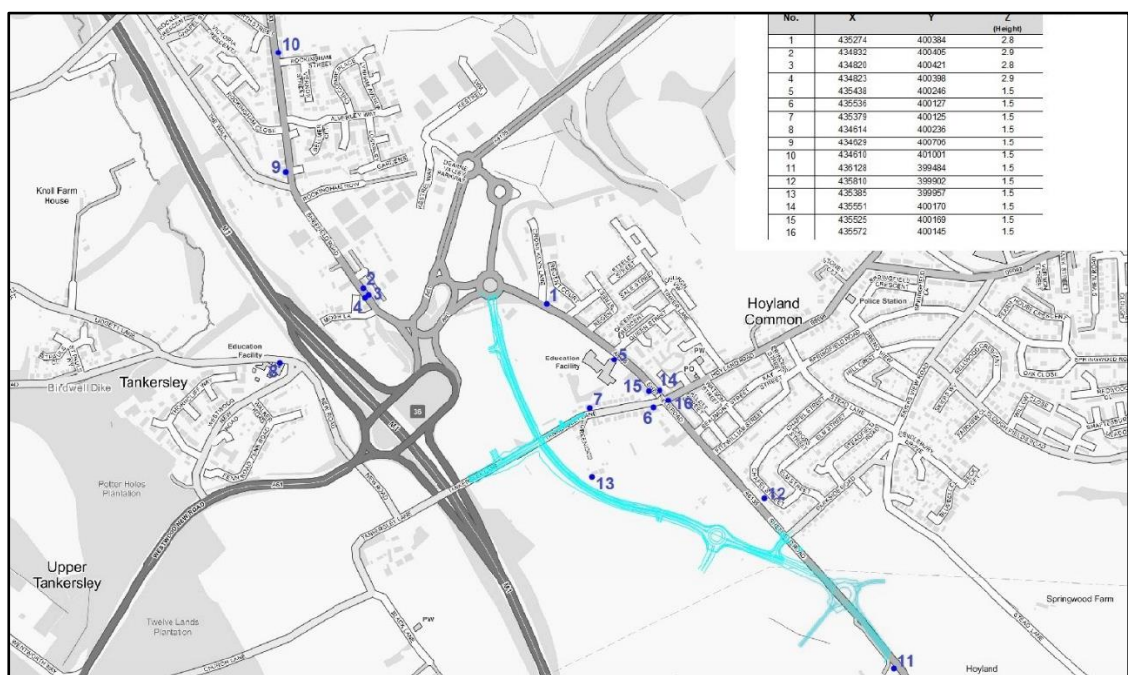


Figure 5.1: Modelling Locations

No.	Type	X	Y	Z (Height)
1	DT24 (Monitoring Site)	435274	400384	2.8
2	DT25 (Monitoring Site)	434832	400405	2.9
3	DT26 (Monitoring Site)	434820	400421	2.8
4	DT27 (Monitoring Site)	434823	400398	2.9
5	School	435438	400246	1.5
6	Residential	435536	400127	1.5
7	Residential	435379	400125	1.5
8	School	434614	400236	1.5
9	Residential	434629	400706	1.5
10	Residential	434610	401001	1.5
11	Residential	436128	399484	1.5
12	Residential	435810	399902	1.5
13	Residential	435385	399957	1.5
14	Residential	435551	400170	1.5
15	Care Home	435525	400169	1.5
16	Residential	435572	400145	1.5

Table 5.3: Receptor Locations

Sensitive Ecological Receptors

5.38 The air quality impacts associated with the proposed development have the potential to impact ecological sensitive receptors. The IAQM (2020), guidance sets out in Appendix A of the guidance, that the type of ecological sites which may require an air quality impact assessment. These are:

- 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).

5.39 A review of the Multi-Agency Geographic Information for the Countryside website, indicates two Local Nature Reserves (Potter Holes Plantation and Worsbrough Country Park) are located near to the Proposed Development, which is within 200m of a highway which would be impacted by the proposed. On this basis, a screening exercise has been undertaken of the traffic impacts for the construction and operational traffic phases.

Human Receptor Impact Descriptors and Assessment of Significance

- 5.40 Currently there is no official guidance in the UK on how to describe the nature of air quality impacts, nor how to assess their significance. The approach developed by EPUK & IAQM (2017) has therefore been used.
- 5.41 The guidance recommends that the degree of an impact is described by expressing the magnitude of incremental change in pollution concentration as a proportion of the relevant assessment level and examining this change in the context of the new total concentration and its relationship with the assessment criterion, as summarised in Table 5.4.

Long term average Concentration at Receptor in Assessment Year	% Change in concentration relative to Air Quality Assessment Level (AQAL)			
	1	2-5	6-10	>10
75% or less of AQAL	Negligible	Negligible	Slight	Moderate
76-94% of AQAL	Negligible	Slight	Moderate	Moderate
95-102% of AQAL	Slight	Moderate	Moderate	Substantial
103-109% of AQAL	Moderate	Moderate	Substantial	Substantial
110% or more of AQAL	Moderate	Substantial	Substantial	Substantial

Table 5.4: Impact Descriptors for Individual Receptors

- 5.42 The approach set out in the EPUK & IAQM (2017) guidance provides a method for describing the impact magnitude at individual receptors only. The guidance outlines that this change may have an effect on the receptor depending on the severity of the impact and other factors that may need to be taken into account. The assessment framework for describing impacts can be used as a starting point to make a judgement on significance of effect. However, whilst there may be 'slight', 'moderate' or 'substantial' impacts described at one or more receptors, the overall effect may not necessarily be judged as being significant in some circumstances.
- 5.43 Following the approach to assessing significance outlined in the EPUK & IAQM (2017) guidance, the significance of likely residual effects of the completed Proposed development on air quality has been established through professional judgement and the consideration of the following factors:
- The geographical extent (local, district or regional) of effects;
 - The duration (temporary or long term);
 - Their reversibility (reversible or permanent);
 - The magnitude of changes in pollution concentrations;
 - The exceedance of standards (e.g. AQS objectives); and
 - The changes in pollutant exposure
- 5.44 A summary of the professional experience of the staff contributing to this assessment is provided in Appendix I.

Ecological Receptor Impact Descriptors and Assessment of Significance

- 5.45 The DMRB guidance, does not provide thresholds for determining the significance of changes in nutrient nitrogen deposition. However, the hierarchy of assessment in the Environment Agency's, on-line risk assessment guidance, states that any process contribution, (analogous

to the change in nutrient nitrogen deposition from the road) that is under 1%, effects from such changes can be screened out as not significant.

- 5.46 Highway England's Interim Advice Note 174/13 (IAN 174/13) Evaluation of Significant Local Air Quality Effects is supplementary to the guidance given in DMRB Volume 11, Section 3, Part 1 (HA207/07). IAN 174/13 states that:

"If the objective is exceeded, then significant effects may occur, and further consideration should be given to the magnitude of change. The exception to this is where changes are less than $0.4\mu\text{g}/\text{m}^3$, then effects are considered to be imperceptible and unlikely to be significant.

Where changes in NO_x concentrations are greater than $0.4\mu\text{g}/\text{m}^3$ then this information along with changes in nutrient nitrogen deposition should be provided to the scheme ecologist to determine the significance of effects based on their professional judgement."

Geographical Scope

- 5.47 The geographical scope of the assessment has been defined by the following criteria.

Construction Dust Phase for Human and Ecological Receptors

- 5.48 The IAQM (2014) assessment guidance sets out the following criteria and recommended requirements for the undertaking of a qualitative assessment of dust and emissions associated with the construction phase:

- a 'human receptor' within:
 - 350m of the boundary of the Site; or
 - 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the Site entrance(s).
- an 'ecological receptor' within:
 - 50m of the boundary of the Site; or
 - 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the Site entrance(s).

- 5.49 It is considered that within these distances the impacts of dust soiling and increased particulate matter in the ambient air will have the greatest impact on local air quality at sensitive receptors.

Operational / Construction Traffic Phase for Human Receptors

- 5.50 The EPUK & IAQM, (2017) assessment guidance sets thresholds for the recommended requirements for the undertaking of full impact assessment on sensitive human receptors due to the changes in daily vehicular traffic as a result of a Proposed Development. The criteria considers the daily traffic movements change by the following:

- A change of LGV (light goods vehicle) flow of:
 - More than 100 AADT within or adjacent to an AQMA; or
 - More than 500 AADT elsewhere.

- A change of HGV (heavy goods vehicles) flow of:
 - More than 25 AADT within or adjacent to an AQMA; or
 - More than 100 AADT elsewhere.

5.51 It is considered that below these thresholds the impacts would be 'negligible' upon sensitive receptors. This is discussed in more detail in Appendix I.

Operational / Construction Traffic Phase for Ecological Receptors

5.52 The DMRB guidance, (HA207/07) sets out for when a full impact assessment on sensitive ecological receptors is to be undertaken due to the changes in the following highway conditions (if within 200m of the centre of the affected highway):

- Horizontal road alignment will change by 5m or more;
- Daily traffic flows will change by more than 1,000 Annual Average Daily Traffic (AADT);
- Heavy Duty Vehicle (HDV) flows will change by more than 200 AADT;
- Daily average speed will change by more than 10kph; or
- Peak hour speed will change by more than 20kph.

5.53 To note, the DMRB assessment criterion is based upon considering impacts in isolation and combination with other plans and projects. Furthermore, increases in vehicular volumes are also reiterated in the IAQM (2020) guidance.

Temporal Scope

5.54 The assessment of air quality effects due to changes in traffic has been considered for both the construction and operational phases of the proposed development.

5.55 The construction phase has been assessed based upon a peak construction year of 2020 and 2021, for the test scenarios set out in paragraph 5.33.

5.56 The operational phase has been assessed based upon the completion year of 2029, for the test scenarios set out in paragraph 5.33.

5.57 In addition to these modelling scenarios a verification process has been undertaken based upon BMBC 2019 monitoring data.

Assumptions & Limitations

5.58 There are many uncertainties when considering both measured and predicted pollution concentrations. The model is dependent upon the traffic data provided for the project, and should this be subject to change, so may the resulting pollution concentrations.

5.59 The background air quality concentration has been taken from the Defra background mapping. The Defra website includes estimated background air pollution data for NO_x, NO₂, PM₁₀ and PM_{2.5} for each 1km by 1km OS grid square. Background pollutant concentrations are modelled from the base year of 2017 and based on ambient monitoring, meteorological data from 2017 and then includes projections for future years, up to currently 2030.

5.60 In order to reduce the uncertainty associated with predicted concentrations a model verification process has been undertaken following guidance set out in LAQM.TG(16) and is set out in Appendix I.

5.61 Furthermore, it has been widely known for some time, that NO_x/NO₂ levels are not reducing as quickly as anticipated and this was identified by Defra in 2011. This was recently reiterated in an IAQM Interim Position Statement released in October 2016, recognising that emissions from diesel vehicles have not declined as expected by Defra. It states:

“it has been known since around 2011 that [NO_x] emissions from diesel vehicles have not declined as expected despite the introduction of increasingly more stringent European Union (EU) emission limits”.

5.62 Consequently, a ‘Calculator Using Realistic Emissions for Diesels’, (CURED) sensitivity test has been included to provide a reasonable worst-case set of emission factors for modelling. The CURED emission factors take account of recent real-world emissions test data. This method has been used as part of the modelling process to reduce the model uncertainty for both vehicular and background nitrogen dioxide (NO₂) concentrations.

Baseline Conditions

Local Air Quality Management

5.63 Under the Air Quality Strategy there is a duty on all Local Authorities to consider the air quality within their boundaries and to report annually to Defra. Local air quality management in the area has been assessed by BMBC through the national Review and Assessment process, in fulfilment of Part IV of the Environment Act 1995.

5.64 BMBC have six declared AQMA's for exceedances of the nitrogen dioxide (NO₂) annual mean objective (and in one case also the hourly mean objective).

5.65 The closest AQMA to the site is ‘Barnsley AQMA 1, which is located on the western area of the Site, as it covers a large 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. The closest AQMA to the site are highlighted in green in Figure 6 in Appendix I.

5.66 BMBC have three automatic monitoring locations, monitoring nitrogen dioxide (NO₂) and PM₁₀. This automatic monitoring locations are supported by a network of non-automatic, nitrogen dioxide (NO₂) diffusion tubes.

5.67 A number of diffusion tubes are located near to the application site (see Figure 5.2, p32).



Figure 5.2 – Location of Diffusion Tubes.

- 5.68 Table 5.5 provides the monitoring results for the monitoring sites close to the site, which are also illustrated in Figure 6 of Appendix I.

ID	Site	Type	2016	2017	2018	2019
DT24	A6135 Hoyland	Kerbside	32.5	40	30.2	30.3
DT25	A61 Sheffield Road	Roadside	42.9	40.2	34.3	38.6
DT26	A61 Sheffield Road	Roadside	44.8	43.2	40.1	40.3
DT27	A61 Sheffield Road	Roadside	39.5	38.6	39.1	39.8
DT28	Tankersley School	Roadside	25.5	22.6	23.9	23.6

Table 5.5: Nearest NO₂ Air Quality Monitoring Data (µg/m³)

- 5.69 The annual mean concentrations for the closest monitoring locations, indicate consistent exceedances of the nitrogen dioxide (NO₂) objective of 40ug/m³ at DT26, but while DT24 almost exceeded the objective in 2017, historically at DT24, DT27 and DT28 have not had any exceedances of the annual mean objective. To note, DT25 has not seen any exceedances in the last 2 years.

Defra Background Mapping

- 5.70 The background pollutant concentrations for each identified receptor modelling location, for the existing baseline year (2020), peak construction traffic year (2021) and the completed development year (2029), have each been taken for the closest 1km x 1km grid to each receptor location, from the Defra background mapping.
- 5.71 To note, a sensitivity background nitrogen dioxide (NO₂) has been derived for each receptor location and assessment year. The background concentrations are presented in Table 5.6. All the annual mean background concentrations are well below the relevant objectives.

Year	NO ₂	NO ₂ CURED	PM ₁₀	PM _{2.5}
2020	11.1 – 15.8	11.6 – 16.6	10.7 – 12.8	6.7 – 8.4
2021	10.6 – 15.0	11.2 – 16.0	10.6 – 12.2	6.6 – 8.3

2029	8.3 – 10.9	9.8 – 13.8	10.3 – 12.4	6.3 – 7.9
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Table 5:6: Background Air Quality Data ($\mu\text{g}/\text{m}^3$)**Baseline Model Results**

- 5.72 Concentrations of nitrogen dioxide, (NO_2), PM_{10} and $\text{PM}_{2.5}$ have been modelled at each of the receptor locations. The results, which cover both the existing Scenario 2 (2020), and future years Scenario 3 (2021) and Scenario 4 (2029), are set out in Tables 5.7 to 5.9 (the receptor locations are shown at Figure 5.1, p26). The predictions for nitrogen dioxide (NO_2) include the CURED sensitivity test which accounts for the potential under-performance of emissions control technology on modern diesel vehicles.

Receptor	NO_2	NO_2 CURED	PM_{10}	$\text{PM}_{2.5}$
1	25.25	25.68	12.94	8.13
2	36.39	36.73	15.89	9.83
3	36.31	36.65	15.90	9.84
4	34.83	35.21	15.45	9.59
5	21.63	22.13	12.22	7.71
6	20.95	21.50	12.00	7.59
7	19.12	19.66	11.67	7.40
8	28.34	28.89	13.89	8.70
9	33.23	33.64	15.29	9.48
10	31.17	31.43	14.64	9.16
11	16.80	17.24	11.82	7.31
12	20.57	21.21	13.98	9.05
13	19.30	19.96	13.45	8.78
14	32.66	33.01	14.08	8.81
15	24.83	25.30	12.68	7.99
16	36.97	37.18	14.91	9.29

Table 5:7: Predicted 2020 Baseline Annual Mean Concentrations ($\mu\text{g}/\text{m}^3$)

Receptor	NO_2	NO_2 CURED	PM_{10}	$\text{PM}_{2.5}$
1	23.63	24.51	12.85	8.04
2	33.96	35.03	15.78	9.72
3	33.89	34.96	15.79	9.73
4	32.52	33.57	15.35	9.48
5	20.31	21.13	12.13	7.63
6	19.70	20.55	11.92	7.51
7	18.03	18.81	11.58	7.32
8	26.56	27.55	13.79	8.61
9	31.06	32.08	15.19	9.38
10	29.13	29.99	14.56	9.06
11	15.88	16.53	11.94	7.23
12	17.58	20.22	13.29	8.98
13	16.41	19.02	12.76	8.70
14	30.43	31.46	13.98	8.70
15	23.24	24.13	12.59	7.90
16	34.47	35.53	14.80	9.18

Table 5:8: Predicted 2021 Baseline Annual Mean Concentrations ($\mu\text{g}/\text{m}^3$)

Receptor	NO ₂	NO ₂ CURED	PM ₁₀	PM _{2.5}
1	15.41	19.95	12.65	7.77
2	21.09	27.98	15.51	9.37
3	21.06	27.94	15.53	9.38
4	20.32	26.90	15.07	9.13
5	13.58	17.36	11.88	7.34
6	13.22	16.81	11.62	7.20
7	12.34	15.54	11.27	7.01
8	17.17	22.49	13.47	8.26
9	19.49	25.90	14.91	9.04
10	18.07	23.81	14.31	8.75
11	11.06	13.78	11.65	6.94
12	13.04	16.72	13.62	8.64
13	12.43	15.85	13.04	8.34
14	19.16	25.07	13.84	8.43
15	15.16	19.54	12.36	7.61
16	21.42	28.09	14.68	8.90

Table 5.9: Predicted 2029 Baseline Annual Mean Concentrations (µg/m³)

Baseline Results Summary

- 5.73 The predicted annual mean concentrations of nitrogen dioxide (NO₂), PM₁₀ and PM_{2.5} are all below their respective annual mean objectives in 2020, 2021 and 2029 at all receptors.
- 5.74 The annual mean nitrogen dioxide (NO₂) concentrations are also all below 60 µg/m³, which is regarded to be an indicator that the hourly mean objective will also not be breached.
- 5.75 The annual mean PM₁₀ concentrations are below 32 µg/m³, which is an indication of potential exceedances of the 24-hour mean PM₁₀ objective and it is, therefore, unlikely that the 24-hour mean PM₁₀ objective will be exceeded.

Baseline Results for Sensitivity Test for Nitrogen Dioxide

- 5.76 The results from the sensitivity test are not materially different from those derived using the 'official' predictions, with predicted annual mean concentrations of nitrogen dioxide (NO₂) below the objectives at all receptors.

Identification of Likely Effects

Construction Impacts and Effects

Proposed development Infrastructure Construction Traffic for Human Receptors (Test 1)

- 5.77 The predicted impacts of the construction traffic for the infrastructure element of the construction phase, will see increases in HGV's of greater than 25 movements per day through the M1 slip roads, which is located within an AQMA. This breaches the EPUK & IAQM (2017) thresholds set out in Appendix I. Therefore, a full impact assessment has been undertaken.
- 5.78 The predicted impacts of the Proposed development Infrastructure Construction Phase upon the annual mean concentrations of nitrogen dioxide, (NO₂), PM₁₀ and PM_{2.5} in 2020, (for the previously specified receptors) are set out in Table(s) 5.10 to 5.12 and for Scenario *Test 1*. These tables also describe the impacts at each receptor using the magnitude and significance

impact descriptors given in Table 5.4. The predictions for nitrogen dioxide (NO₂) include a sensitivity test which accounts for the potential under-performance of emissions control technology on modern diesel vehicles.

Receptor	2020 Baseline	2020 Baseline + Proposed development Construction	% Change of Objective	Impact Descriptor
Official Emission Factors				
1	25.25	25.30	0	Negligible
2	36.39	36.46	0	Negligible
3	36.31	36.38	0	Negligible
4	34.83	34.89	0	Negligible
5	21.63	21.67	0	Negligible
6	20.95	20.99	0	Negligible
7	19.12	19.16	0	Negligible
8	28.34	28.36	0	Negligible
9	33.23	33.28	0	Negligible
10	31.17	31.26	0	Negligible
11	16.80	16.80	0	Negligible
12	20.57	20.57	0	Negligible
13	19.30	19.31	0	Negligible
14	32.66	32.74	0	Negligible
15	24.83	24.89	0	Negligible
16	36.97	37.02	0	Negligible
Sensitivity Emission Factors				
1	25.68	25.74	0	Negligible
2	36.73	36.77	0	Negligible
3	36.65	36.69	0	Negligible
4	35.21	35.24	0	Negligible
5	22.13	22.17	0	Negligible
6	21.50	21.54	0	Negligible
7	19.66	19.70	0	Negligible
8	28.89	28.90	0	Negligible
9	33.64	33.67	0	Negligible
10	31.43	31.46	0	Negligible
11	17.24	17.25	0	Negligible
12	21.21	21.22	0	Negligible
13	19.96	19.97	0	Negligible
14	33.01	33.10	0	Negligible
15	25.30	25.36	0	Negligible
16	37.18	37.23	0	Negligible

Table 5:10: Predicted Impact on Annual Mean NO₂ Concentrations (µg/m³)

Receptor	2020 Baseline	2020 Baseline + Proposed development Construction	% Change of Objective	Impact Descriptor
1	12.94	12.96	0	Negligible
2	15.89	15.90	0	Negligible
3	15.90	15.92	0	Negligible

4	15.45	15.47	0	Negligible
5	12.22	12.23	0	Negligible
6	12.00	12.01	0	Negligible
7	11.67	11.68	0	Negligible
8	13.89	13.89	0	Negligible
9	15.29	15.30	0	Negligible
10	14.64	14.66	0	Negligible
11	11.82	11.82	0	Negligible
12	13.98	13.98	0	Negligible
13	13.45	13.45	0	Negligible
14	14.08	14.10	0	Negligible
15	12.68	12.70	0	Negligible
16	14.91	14.92	0	Negligible

Table 5:11: Predicted Impact on Annual Mean PM10 Concentrations (µg/m3)

Receptor	2020 Baseline	2020 Baseline + Proposed Development	% Change of Objective	Impact Descriptor
1	8.13	8.14	0	Negligible
2	9.83	9.84	0	Negligible
3	9.84	9.85	0	Negligible
4	9.59	9.60	0	Negligible
5	7.71	7.72	0	Negligible
6	7.59	7.60	0	Negligible
7	7.40	7.41	0	Negligible
8	8.70	8.70	0	Negligible
9	9.48	9.48	0	Negligible
10	9.16	9.17	0	Negligible
11	7.31	7.31	0	Negligible
12	9.05	9.05	0	Negligible
13	8.78	8.78	0	Negligible
14	8.81	8.82	0	Negligible
15	7.99	7.99	0	Negligible
1	9.29	9.30	0	Negligible

Table 5:12: Predicted Impact on Annual Mean PM2.5 Concentrations (µg/m3)

Construction (Infrastructure) Traffic Impacts Summary

- 5.79 The modelled nitrogen dioxide, (NO₂) concentrations in Table 5.10, show that with both the official emission factors and the 'sensitivity' emissions, nitrogen dioxide (NO₂) concentrations, at all receptor locations are below the annual mean objective (40 µg/m³).
- 5.80 Furthermore, as all of the annual mean nitrogen dioxide (NO₂) concentrations are below 60 µg/m³ and it is unlikely that the 1-hour mean nitrogen dioxide objective will be exceeded.
- 5.81 Using the matrix in Table 5.4, the nitrogen dioxide impacts are predicted to be temporary **'negligible (adverse)'** and **not significant**.
- 5.82 The modelled PM₁₀ concentrations in Table 5.11, do not predict any exceedances of the annual mean objective, (40 µg/m³), at any of the specified receptor locations. Using the matrix in Table 5.4, the impacts are anticipated to be temporary **negligible (adverse)** and **not significant**.

- 5.83 For PM₁₀, the following equation can be used to derive the number of days that the daily mean limit (of 50µg.m³) is likely to be exceeded:

$$\text{No. 24 hour exceedances} = -18.5 + 0.00145 \times \text{annual mean}^3 + \left(\frac{206}{\text{annual mean}} \right)$$

- 5.84 The highest annual mean PM₁₀ concentration in Table 5.11, is 15.92 µg/m³. Based on the above formula, this predicts 0 exceedance days, which is below the 35-days annual limit. It is therefore predicted that none of the receptors would be exposed to any material impact from the short-term concentrations of PM₁₀.

- 5.85 The modelled PM_{2.5} concentrations in Table 5.12, do not predict any exceedances of the annual mean objective for PM_{2.5}, at any of the specified receptor locations. Using the matrix in Table 5.3, the impacts are predicted to be temporary **negligible (adverse)** and **not significant**.

Proposed development (Building) Construction Traffic for Human Receptors (Test 2)

- 5.86 The predicted impacts of the construction traffic for the development of the buildings (Test 2) for the Proposed development has been screened against the EPUK & IAQM (2017) thresholds set out in Appendix I, and the estimates do not exceed the EPUK & IAQM (2017) thresholds. Therefore, a full impact assessment has therefore been scoped out of this assessment, and any impact would be temporary **negligible (adverse)** but **not significant**.

Proposed development Construction Traffic for Ecological Receptors (Test(s) 1 & 2)

- 5.87 The predicted vehicular impacts of the construction traffic (for both the infrastructure and buildings stages – Test(s) 1 & 2) of the Proposed development is not greater than 1,000 AADT or more, or increase of 200 AADT or more of heavy-duty vehicles, on the highway links adjacent to Potter Holes Plantation nature reserve and Worsbrough Country Park nature reserve. Therefore, an impact assessment has been scoped out, and any impact would be temporary **negligible (adverse)**, but **not significant**.

Proposed development Construction Dust Assessment

Introduction

- 5.88 The main air quality impacts associated with construction activities relate to the potential release of dust. There is also the potential for the evolution of other air quality pollutants, (known as secondary pollutants). The sources of potential construction impacts, specifically associated with the Proposed development are set out below:

- Potential for generation of airborne dusts from exposure and movement of soils and construction materials;
- Generation of fumes on-site by construction plant and tools throughout the construction phase;
- Increase in vehicle emissions (smoke/fumes) from vehicles (and potentially as a result of slow-moving traffic, should local congestion ensue); and
- Re-suspension of dust as a result of vehicle tyres travelling over dusty surfaces.

- 5.89 A construction dust assessment has been undertaken in line with the IAQM (2014) guidance methodology as set out in Appendix I and a summary of the resulting risk categories for the four construction activities, without mitigation, are set out in Table 5.13.

	Demolition	Earthworks	Construction	Trackout
Dust Soiling	N/A	Medium Risk	Medium Risk	Low Risk
Human Health	N/A	Low Risk	Low Risk	Low Risk
Ecological	N/A	Negligible	Negligible	Negligible

Table 5.13: Summary of Dust Risk

- 5.90 The IAQM (2014) guidance does not provide a method for assessing the significance of effects before mitigation and advises that pre-mitigation significance should not be determined. With appropriate mitigation in place, the IAQM guidance is clear that the residual effect will normally be 'not significant.'

Operational Impacts and Effects

Operational Traffic Impacts for Human Receptors (Test 3)

- 5.91 The predicted impacts of the Proposed development upon the annual mean concentrations of nitrogen dioxide, (NO₂), PM₁₀ and PM_{2.5} in 2029, (for the previously specified receptors) are set out in Table(s) 5.14 to 5.16 and for Scenario Test 3. These also describe the impacts at each receptor using the magnitude and significance impact descriptors given in Table 5.4. The predictions for nitrogen dioxide (NO₂) include a sensitivity test which accounts for the potential under-performance of emissions control technology on modern diesel vehicles.

Receptor	2029 Baseline	2029 Baseline + Proposed Development	% Change of Objective	Impact Descriptor
Official Emission Factors				
1	15.41	14.61	-2	Negligible
2	21.09	21.34	1	Negligible
3	21.06	21.30	1	Negligible
4	20.32	20.55	1	Negligible
5	13.58	13.09	-1	Negligible
6	13.22	12.83	-1	Negligible
7	12.34	12.95	2	Negligible
8	17.17	17.29	0	Negligible
9	19.49	19.66	0	Negligible
10	18.07	18.27	0	Negligible
11	11.06	11.39	1	Negligible
12	13.04	11.81	-3	Negligible
13	12.43	14.75	6	Slight
14	19.16	17.08	-5	Negligible
15	15.16	14.21	-2	Negligible
16	21.42	17.45	-10	Slight
Sensitivity Emission Factors				
1	19.95	18.83	-3	Negligible
2	27.98	28.44	1	Negligible
3	27.94	28.39	1	Negligible
4	26.90	27.36	1	Negligible
5	17.36	16.71	-2	Negligible

6	16.81	16.41	-1	Negligible
7	15.54	16.55	3	Negligible
8	22.49	22.90	1	Negligible
9	25.90	26.13	1	Negligible
10	23.81	24.07	1	Negligible
11	13.78	14.27	1	Negligible
12	16.72	15.06	-4	Negligible
13	15.85	19.03	8	Slight
14	25.07	22.27	-7	Slight
15	19.54	18.29	-3	Negligible
16	28.09	22.95	-13	Moderate

Table 5:14: Predicted Impact on Annual Mean NO2 Concentrations (µg/m3)

Receptor	2029 Baseline	2029 Baseline + Proposed Development	% Change of Objective	Impact Descriptor
1	12.65	12.32	-1	Negligible
2	15.51	15.65	0	Negligible
3	15.53	15.67	0	Negligible
4	15.07	15.19	0	Negligible
5	11.88	11.70	0	Negligible
6	11.62	11.51	0	Negligible
7	11.27	11.58	1	Negligible
8	13.47	13.53	0	Negligible
9	14.91	15.02	0	Negligible
10	14.31	14.44	0	Negligible
11	11.65	11.85	0	Negligible
12	13.62	13.08	-1	Negligible
13	13.04	14.26	3	Negligible
14	13.84	13.07	-2	Negligible
15	12.36	12.03	-1	Negligible
16	14.68	13.19	-4	Negligible

Table 5:15: Predicted Impact on Annual Mean PM10 Concentrations (µg/m3)

Receptor	2029 Baseline	2029 Baseline + Proposed Development	% Change of Objective	Impact Descriptor
1	7.77	7.58	-1	Negligible
2	9.37	9.45	0	Negligible
3	9.38	9.46	0	Negligible
4	9.13	9.21	0	Negligible
5	7.34	7.24	0	Negligible
6	7.20	7.14	0	Negligible
7	7.01	7.18	1	Negligible
8	8.26	8.30	0	Negligible
9	9.04	9.09	0	Negligible
10	8.75	8.81	0	Negligible
11	6.94	7.05	0	Negligible
12	8.64	8.34	-1	Negligible
13	8.34	9.00	3	Negligible
14	8.43	8.01	-2	Negligible

15	7.61	7.43	-1	Negligible
1	8.90	8.07	-3	Negligible

Table 5:16: Predicted Impact on Annual Mean PM_{2.5} Concentrations (µg/m³)***Operational Traffic Impacts Summary***

- 5.92 The modelled nitrogen dioxide, (NO₂) concentrations in Table 5.14, show that with both the official emission factors and the 'sensitivity' emissions, nitrogen dioxide (NO₂) concentrations, at all receptor locations are below the annual mean objective (40 µg/m³).
- 5.93 Furthermore, as all of the annual mean nitrogen dioxide (NO₂) concentrations are below 60 µg/m³ and it is unlikely that the 1-hour mean nitrogen dioxide objective will be exceeded.
- 5.94 Using the matrix in Table 5.4, the nitrogen dioxide impacts are predicted to be **"moderate (beneficial) to slight (adverse)"** and **not significant**.
- 5.95 The modelled PM₁₀ concentrations in Table 5.15, do not predict any exceedances of the annual mean objective, (40 µg/m³), at any of the specified receptor locations. Using the matrix in Table 5.4, the impacts are anticipated to be **"negligible (beneficial to adverse)"** and **not significant**.
- 5.96 For PM₁₀, the following equation can be used to derive the number of days that the daily mean limit (of 50µg.m³) is likely to be exceeded:

$$\text{No. 24 hour exceedances} = -18.5 + 0.00145 \times \text{annual mean}^3 + \left(\frac{206}{\text{annual mean}} \right)$$

- 5.97 The highest annual mean PM₁₀ concentration in Table 5.15, is 15.67 µg/m³. Based on the above formula, this predicts 0 exceedance days, which is below the 35-days annual limit. It is therefore predicted that none of the receptors would be exposed to any material impact from the short-term concentrations of PM₁₀.
- 5.98 The modelled PM_{2.5} concentrations in Table 5.16, do not predict any exceedances of the annual mean objective for PM_{2.5}, at any of the specified receptor locations. Using the matrix in Table 5.4, the impacts are predicted to be **"negligible (beneficial to adverse)"** and **not significant**.

Operational Traffic Impacts for Ecological Receptors

- 5.99 The predicted vehicular impacts of the operational traffic (Test 3) of the Proposed development is not greater than 1,000 AADT or more, or increase of 200 AADT or more of heavy-duty vehicles, on the highway links adjacent to Potter Holes Plantation nature reserve and Worsbrough Country Park nature reserve. Therefore, an impact assessment could be scoped out, however any impact would be **negligible (adverse)**, but **not significant**.

Defra Damage Cost Calculation

- 5.100 As set out Appendix I, a 'damage costs' assessment has been completed, in line with the BMBC *Air Quality and Emissions Good Practice Planning Guidance*. Damage costs are a simple way to value changes in air pollution. They estimate the cost of a change in emissions of different pollutants.
- 5.101 The total damage costs provide in Appendix I, shows the potential costs associated with the effect of air pollution from the Proposed development on the wider area. The calculated figure

will be put towards various mitigation measures shown in the Mitigation section of this ES Chapter, and it does not represent a sum owed by the developer.

Other Operational Impacts

- 5.102 Plot 1 of the proposals already has a potential end occupier of the B8 class land use. Therefore, the main air quality impacts associated with his land use primarily relate to vehicular traffic.
- 5.103 However, the end occupier of plots 2 & 3 is unknown at this stage. Due to the flexibility of land uses (Use Classes B1, B2, B8) being proposed it is unknown at this stage what if any industrial processes could be proposed moving forward.
- 5.104 Once it is known what specific industrial processes are proposed, an appropriate air quality assessment can be provided at the detailed design stage in support of an application for a permit to operate. The appropriate assessment will have to demonstrate that the air quality concentrations at sensitive receptor locations do not exceed any of the air quality objectives.

Impact of Climate Change

- 5.105 Changes in atmospheric composition and their impact on climate change are uncertain and it is not possible to accurately quantify them at the local level.
- 5.106 This ES Chapter has included air quality dispersion modelling. Throughout the modelling process, detailed metrological data has been input into the model which considers fluctuations in weather conditions throughout a full calendar year (2019).
- 5.107 Through the implementation of the operational mitigation measures set out in this ES Chapter it is considered that no significant effects are likely to arise in relation to climate change.

Significance of Identified Effects

Construction Impacts and Effects

Proposed development Construction Dust Assessment

- 5.108 The IAQM (2014) guidance does not provide a method for assessing the significance of effects before mitigation and advises that pre-mitigation significance should not be determined. With appropriate mitigation in place, (as set out in the *Mitigation and Monitoring Measures* section of this ES chapter (and further detailed in Appendix I) the IAQM (2004) guidance is clear that the residual effect will normally be ‘not significant.’

Proposed development Construction Traffic on Ecological Receptors

- 5.109 The nitrogen dioxide (NO₂), PM₁₀ and PM_{2.5} impacts are predicted to be temporary “**negligible (adverse)**” and **not significant**.

Proposed development Construction Traffic on Human Receptors

- 5.110 The nitrogen dioxide (NO₂), PM₁₀ and PM_{2.5} impacts are predicted to be temporary “**negligible (adverse)**” and **not significant**.

Operational Impacts and Effects

Proposed development Operational Traffic on Ecological Receptors

- 5.111 The nitrogen dioxide (NO₂), PM₁₀ and PM_{2.5} impacts are predicted to be “**negligible (adverse)**” and **not significant**.

Proposed development Operational Traffic on Human Receptors

- 5.112 The nitrogen dioxide (NO₂) impacts are predicted to be “**moderate (beneficial) to slight (adverse)**” and **not significant**.
- 5.113 The PM₁₀ impacts are predicted to be “**negligible (beneficial to adverse)**” and **not significant**.
- 5.114 The PM_{2.5} impacts are predicted to be “**negligible (beneficial to adverse)**” and **not significant**.

Cumulative Impacts

- 5.115 As previously set in this ES Chapter, Vanguardia have been advised that both committed developments and the TEMPro (Trip End Model Presentation Program) has been utilised to growth up the baseline and development scenarios. Fore Consulting have advised that the following committed developments have been provided within the traffic data:
- 2018/1039: Land off Lidgett Lane/ Pilley Green, Pilley – residential development of up to 72 dwellings.
 - 2017/1341: Land off New Road, Pilley – residential development of up to 56 dwellings.
 - 2018/1361: Land off New Road, Tankersley – residential development up to 29 dwellings.
 - 2016/1531: Land north of Hawshaw Lane – outline application for residential development up to 100 dwellings.
 - 2019/1573: Rockingham Phase 2 and 3, Hoyland – hybrid application for B1C, B2 and B8 employment floorspace with a development quantum of up to 1.1m sqft (102,193sqm).

Mitigation and Monitoring Measures

Construction

- 5.116 A construction dust assessment has been undertaken for the proposed development and is summarised earlier in this ES Chapter. The assessment has been used to identify the need for standard and best practice mitigation measures to be implemented during the construction phase of the Proposed Development. These measures will be controlled and implemented through a Construction Environmental Management Plan (CEMP), which is anticipated to be secured via a suitably worded planning condition.
- 5.117 A range of measures are suggested and summarised below, which would typically be utilised during the construction phase, with further general mitigation options detailed in Appendix I.

Earthworks

- Avoid earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable;
- Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable; and
- Only remove the cover in small areas during work and not all at once.

Construction

- Avoid scabbling (roughening of concrete surfaces (where 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;
- Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery; and
- For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.

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; and
- Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).

Operational

- 5.118 A review of the BMBC Air Quality and Emissions Good Practice Planning Guidance has been undertaken. As the proposed development is considered as a 'Major' development. On that basis, the guidance advises that 'Type1' and 'Type 2' mitigation should be installed as a default.

Type 1 Mitigation

- 5.119 Type 1 mitigation advises that for Commercial / Industrial sites 10% of parking spaces which may be phased with 5% initial provision and the remainder at an agreed level. It is understood that this provision is inherently proposed within the planning application.

Type 2 Mitigation

- 5.120 Type 2 mitigation includes the implementation of a Travel Plan. The Travel Plan should be focussed at reducing the use of high emission vehicles and promoting the modal shift towards sustainable transport uses.

Type 3 Mitigation

- 5.121 Type 3 mitigation builds on Type 2 mitigation and goes further to support the use of pooled low emission vehicles, and further reduction of high emission vehicles and shift towards sustainable transport measures.

Other Operational Impact Mitigation

- 5.122 Once it is known what specific industrial processes, (which may release pollutants to the air – if any) are proposed, an appropriate air quality assessment shall be provided at the detailed design stage in support of an application for a permit to operate. The appropriate assessment will have to demonstrate that the air quality concentrations at an existing or proposed receptor do not exceed any of the air quality objectives.

Summary

Introduction

- 5.123 This ES Chapter has assessed the impacts of both the construction and operational phase of Proposed development in isolation and in conjunction with committed developments. The assessment has considered the resulting impacts against the appropriate baseline conditions and the overall impacts are summarised below.

Construction Dust Impacts

- 5.124 A construction dust assessment has been undertaken for the construction phase associated with the Proposed development and in accordance with IAQM (2014) guidance.
- 5.125 Following the successful implementation of the suggested mitigation measures, the impacts of the p
- 5.126 roposed development construction dust and emissions from demolition and construction activities upon the local area and sensitive receptors although adverse, the impacts will be **‘negligible’** temporary and **not significant**.

Human Receptor Construction Traffic Impacts

- 5.127 The change in predicted Nitrogen Dioxide (NO₂), PM₁₀ and PM_{2.5} concentrations at existing human receptors in 2020 and 2021 for the construction phases are anticipated to be temporary **‘negligible (adverse)’** and **not significant**.

Ecological Receptor Construction Traffic Impacts

- 5.128 The change in predicted impacts upon ecological receptors during the construction phase are anticipated to be temporary **‘negligible (adverse)’** and **not significant**.

Human Receptor Operational Traffic Impacts

- 5.129 The change in predicted Nitrogen Dioxide (NO₂), PM₁₀ and PM_{2.5} concentrations at existing human receptors in 2029, following completion of the proposed development, results in a predicted operational impacts range from “**moderate (beneficial) to slight (adverse)**’ and **not significant**. As such, no additional mitigation is considered necessary, but some have been proposed as part of the development proposals.
- 5.130 To note, all the modelled receptors locations are below their respective air quality objectives for nitrogen dioxide (NO₂), PM₁₀ & PM_{2.5}.

Ecological Receptor Operational Traffic Impacts

- 5.131 The change in predicted impacts upon ecological receptors during the operational phase are anticipated to be “**negligible (adverse)**’ and **not significant**.

Other Operational Impacts

- 5.132 Plot 1 of the proposals already has a potential end occupier of the B8 class land use. Therefore, the main air quality impacts associated with his land use primarily relate to vehicular traffic, which has been included within this assessment.
- 5.133 However, the end occupier of plots 2 & 3 is unknown at this stage. Due to the flexibility of land uses (Use Classes B1, B2, B8) being proposed it is unknown at this stage what if any industrial processes could be proposed moving forward. However, once known it is anticipated an appropriate assessment will submitted in support of a reserved matters planning application (if required). The appropriate assessment will have to demonstrate that the air quality concentrations at sensitive receptor locations do not exceed any of the air quality objectives.

6. Traffic Movements

Methodology and Assessment Criteria

- 6.1 This chapter of the ES has been prepared by Fore Consulting Ltd and assesses the effects of the development on transport and access.
- 6.2 The chapter describes the methods used to assess the baseline conditions currently existing at the Site and surroundings, the likely direct and indirect effects of the Development, the mitigation measures required to prevent, reduce, or offset the effects and the residual effects.
- 6.3 The chapter is supported by the following appendices that have also been prepared by Fore Consulting Ltd:
- Appendix J: Transport Assessment (TA), May 2020.
 - Appendix J: Travel Plan (TP), May 2020.
- 6.4 The scope and methodology for the Transport Assessment has been discussed and agreed with Barnsley Metropolitan Borough Council (BMBC) as the highway authority, as well as Highways England who is responsible for the operation of the nearby M1 motorway.
- 6.5 The methodology is set out in the full Transport Assessment, as provided in the technical appendices (Appendix J).

Competence

- 6.6 Fore Consulting Ltd is an experienced team of transport planners and consultants who advise in relation to transport and highways aspects of development proposals and planning applications, as well as major transport schemes and regeneration projects.
- 6.7 This assessment has been overseen by Paul Irwin MSc (Eng) BSc (Hons) who is a Director at Fore and is a Member of the Chartered Institution of Highways and Transportation. Paul has over 29 years transport planning experience and has been involved in the preparation of transport and highways chapters for numerous EIAs on a wide range of large development proposals. Paul has reviewed and signed off this Chapter.

Legislation, Planning Policy and Guidance

Planning Policy Context

National

- 6.8 The following national planning policy is relevant to the Development:

- National Planning Policy Framework (2019).

Local

- 6.9 The following local planning policy is relevant to the Development:

- Barnsley Local Plan (2019).

Guidance

6.10 The following guidance is relevant to the Development:

- Planning Practice Guidance (2014).

Significance Criteria

Consultation

6.11 Extensive consultation has been undertaken with BMBC highways and transport planning officers, as well as Highways England and their consultant team in respect of the impact of the development on the Strategic Road Network, through extensive pre-application discussions.

Study Area and Scope

6.12 The methodology for the Transport Assessment (TA) has been informed through a number of key stages. These are as follows:

- Identification of the scope of the assessment area. This was agreed with BMBC and HE during pre-application discussions and covers Sheffield Road, the M1 J36 and associated roundabouts and Tankersley Lane, along with the proposed site access junctions.
- Determination and identification of the existing (baseline) local transport conditions, including: the local highway network, public transport network, and pedestrian and cycle networks.
- Identification of the forecast vehicle trip generation generated by the development once completed.
- Assessment of the impact and likely significant effects of the forecast trips on the local transport network, by undertaking detailed capacity assessments of the junctions identified within the study area as agreed with BMBC.
- Assessment of the impact and likely significant effects of the remediation and construction traffic on the local transport network.
- Analysis of the personal-injury accident record within the study area for the most recently available five-year period, and a qualitative assessment of the impact of the development on road safety.
- Identification and assessment of mitigation measures to be provided as part of the development (including the link road).

6.13 For the purposes of assessing the impact of the development on the operation of the highway network, three scenarios have been considered within this chapter of the ES to assess the environmental effects of the Proposed development as a result of transportation. An outline of the three assessment scenarios and their derivation, is set out below:

- **2019 Base** – Representing the existing transport conditions in the study area. Traffic flows have been derived from surveyed traffic count data.
- **2029 Do Minimum** – Representing a future ‘baseline’ situation. The 2029 Do Minimum scenario establishes the future transport conditions in the study area if the development was not brought forward. In addition to the 2019 Base scenario, predicted traffic flows associated with all known committed developments, as agreed with BMBC, have been included.

- **2029 With Development** – Representing the future scenario if the development was to take place. In addition to the 2029 Do Minimum scenario, predicted traffic flows associated with the Development at maturity have been included. In addition, changes to the layout of the highway network, as outlined by the proposed development has also been taken into account.

Assumptions and Limitations

- 6.14 The assessment work is based on surveyed traffic flow data, which is subject to variation in the future. The assessment is also based on an estimated level of trip generation and distribution. The future scenarios and input parameters contributing to the assessment were discussed with BMBC and Highways England. This includes the base year traffic flows, the committed developments to include, trip generation and distribution assumptions, plus the input parameters to the junction capacity models. This has ensured that the assessment and modelling of the future year scenarios is as robust as possible.

Baseline Conditions

Existing Conditions

Land Use

- 6.15 The site currently comprises open fields / agricultural land. The Rockingham Community Centre is located at the north east of the site and comprises a cricket field and football pitch. Tankersley Lane bisects the site from east to west, providing a connection between the A61 Westwood New Road and the A6135 Sheffield Road.
- 6.16 The site is bound by Junction 36 of the M1 (known locally as Tankersley Roundabout) and the Birdwell Roundabout to the north, the A6135 Sheffield Road to the east, open fields/ agricultural land and a wooded area to the south, and hedgerows segregating the site from the M1 to the west. To the north east, the site is bound by Hoyland Common Primary School, residential properties along Tankersley Lane, a Shell petrol filling station and a service yard.

Highway Network

Strategic Road Network

- 6.17 The development is located immediately south east of Junction 36 of the M1, which forms part of the Strategic Road Network and provides connections from the Hoyland District to key regional and national towns and cities such as Barnsley, Sheffield, Rotherham, Leeds, Nottingham, Derby and London.
- 6.18 Junction 36 (Birdwell Interchange) comprises of a roundabout interchange providing connections between the M1 and the A61. The roundabout is signal-controlled and comprises four approaches with three circulating lanes. A shared-use pedestrian and cycle route is provided around the circulating carriageway, linking to uncontrolled crossing points on the slip roads.

Local Highway Network

- 6.19 The local highway network comprises a number of key links and junctions which are described in the following section.

A61 Sheffield Road / A6195 Dearne Valley Parkway – Birdwell Roundabout Junction

- 6.20 Birdwell roundabout junction is an elongated roundabout located to the immediate north of the development site connecting the A6195 and the A61.
- 6.21 The A6195 Dearne Valley Parkway northern arm is separated into segregated entry and exit only arms both of which are signal controlled and provide pedestrian crossing facilities. There is a shared footway / cycleway on the nearside lanes on both the northbound and southbound carriageways.
- 6.22 The A6195 eastern arm is separated into segregated entry and exit lanes. The exit lane is single carriageway approximately 5m in width with a shared cycleway / footpath on the nearside of the carriageway. The A6195 entry lane is a dual carriageway approximately 10m in width, the approach to the roundabout is controlled by a signalised pedestrian crossing. There is a shared pedestrian / cycleway on the nearside lane.
- 6.23 The A61 southbound arm is separated into two segregated entry lanes and one exit lane. The entry left only lane is a single carriageway and the ahead lane is a dual carriageway, access onto the roundabout for all movements is signal controlled. The exit carriageway is exit only and has no pedestrians or cyclist provision in order to restrict access to J36 of the M1.
- 6.24 The A61 Sheffield Road westbound arm has a triple entry carriageway and a single exit carriageway. Access onto the roundabout is signal controlled. There is a shared pedestrian / cycleway on the westbound carriageway.

Cross Keys Roundabout

- 6.25 Cross Keys Roundabout is a 4-arm roundabout located to the north of the development. The roundabout's southern arm will form access to the development site. All arms are single carriageways of approximately 9m in width. Pedestrian islands are provided approximately 5m from the entrance of the roundabout on all arms, except the western arm (A6195) which is segregated into entry and exit lanes and provides no pedestrian crossing facilities.

Fitzwilliam Roundabout

- 6.26 Fitzwilliam Roundabout follows the same alignment as the Cross Keys Roundabout, except that pedestrian islands are provided on all arms of the roundabout. To the north, the roundabout connects towards the Rockingham Roundabout services and the A6195 Dearne Valley Road. The southern arm of roundabout provides access towards the A6135 Sheffield Road. In addition, the eastern and western arms of the roundabout provide access towards development land.

A6135 Sheffield Road

- 6.27 The A6135 runs along the eastern boundary of the development site. To the north, it provides a link to Cross Keys Roundabout and to the south, the A6135 provides connections from Hoyland towards the villages of Harley and Hood Hill. The A6135 is generally a single-lane carriageway, with a speed limit of 30mph in the vicinity of the development.
- 6.28 The A6135 Sheffield Road serves as a local distributor road, linking Junction 36 of the M1 with the western fringes of Hoyland. The carriageway is lit, is subject to a 30mph speed limit and is flanked by footways along both sides. The A6135 Sheffield Road forms the northern and

southern arms of a four-arm signalised junction with the B6096 Hoyland Road and Tankersley Lane. Waiting restrictions, in the form of double yellow lines, are present along all four approach arms of the junction.

- 6.29 Controlled pedestrian crossings (Pelicans) are provided across the A6135 Sheffield Road (n) and B6096 Hoyland Road arms, located approximately 80m and 65m back from the stop lines respectively. The crossings provide pedestrian connectivity between Hoyland Common Primary School and the eastern side of A6135 Sheffield Road and between the local shops along the B6096 Hoyland Road.
- 6.30 Additionally, uncontrolled pedestrian crossings (dropped kerbs) are provided across all four arms of the junction located in front of the stop lines.

A6195 Dearne Valley Parkway

- 6.31 The A6195 is a two-lane dual carriageway, located to the north of the development site. The A6195 Dearne Valley Parkway is a two-lane dual carriageway, separated by a raised kerbed central reserve. The road is lit and subject to the national speed limit for its entirety.
- 6.32 The A6195 links directly to Junction 36 of the M1 via a four-arm roundabout with the A61 / A6135 Sheffield Road. The A6195 Dearne Valley Parkway serves as the northern bypass to Hoyland, connecting to a number of local distributor roads via a series of three-arm and four-arm roundabouts.

A61 Sheffield Road

- 6.33 The A61 is located to the north of the development site. It is a major road which runs from north to south parallel to the M1 motorway. In relation to the site, the A61 Sheffield Road provides a local connection (northbound) towards Birdwell, Worsborough and Barnsley Town centre. In the vicinity of the site the road comprises of a single carriageway with a speed limit of 30mph.
- 6.34 To the west of the M1 Junction 36, the A61 continues westward as the A61 Westwood New Road) offering connections towards the villages of Tankersley and Howbrook and the A616.

Tankersley Lane

- 6.35 Tankersley Lane runs directly through the centre of the development (from east to west). Tankersley Lane forms the western arm of the four-arm signalised junction with the A6135 Sheffield Road and the B6096 Hoyland Road. Within the immediate vicinity of the junction, Tankersley Lane provides access to a number of residential driveways, which take direct access onto the carriageway.
- 6.36 Tankersley Lane serves as a local road connecting the B6096 Hoyland Road and A6135 Sheffield Road with Church Lane and ultimately the A61 to the far west. The road heads westwards over the M1, before becoming Church Lane immediately beyond an informal three-arm priority junction with Black Lane.
- 6.37 The road is subject to a 30mph speed limit, which changes to the national speed limit approximately 210m west of the signalised junction with the A6135 Sheffield Road / B6096 Hoyland Road. Within the 30mph limit the road is lit and footways are provided on both sides of the road. Beyond that, due to the rural nature of the road, street lighting is not provided though a continuous footway is present on the northern side of the road.

B6096 Hoyland Road

- 6.38 B6096 Hoyland Road is a single-lane carriageway located to the east of the development. In the vicinity of the site the B6096 has a speed limit of 30mph. The road begins at the crossroad junction with the A6135 Sheffield Road and Tankersley Lane and a local connection through Hoyland towards Wombwell. Street lighting continuous footways are presented on both sides of the road.

Surveyed Traffic Flows

- 6.39 Base traffic flows have been derived from turning count surveys, commissioned by BMBC and undertaken on Wednesday 13 March 2019. Fully classified turning count surveys were undertaken at the following locations:

- Site 1: Westwood Roundabout.
- Site 2: Westwood New Road / Church Lane / Wentworth Way.
- Site 3: A61 / Westwood New Road.
- Site 4: Sheffield Road / A6195.
- Site 5: A6135 Sheffield Road / Hoyland Road / Tankersley Lane.
- Site 6: A61 Sheffield Road / The Walk.
- Site 7: Rockingham Roundabout.
- Site 8: Shortwood Roundabout.
- Site 9: M1 Junction 36.

- 6.40 To add to the information collected in these surveys, a supplementary turning count survey was undertaken at the Tankersley Lane / New Road junction on Tuesday 3 March 2020.

Public Transport

Bus Services

- 6.41 The development is located to the east of the residential area of Hoyland and as such is served by a number of bus services. There are stops located within the development site along Tankersley Lane, as well as to the east of the development site on the A6135 Sheffield Road and to the north along A61 Sheffield Road.
- 6.42 Stops located on Tankersley Lane and the majority of stops located of A6135 Sheffield Road consist of bus stop posts, however a number of stops are sheltered with seating.
- 6.43 Details of the buses serving them are in in appendix J (Table 2 and displayed at Figure 4).
- 6.44 In combination the stops mentioned above offer up to 10 services per hour, providing access to destinations such as Barnsley, Ecclesfield, Wombwell and Sheffield. Most of the services offer early morning services and into the night Monday to Sunday.

Rail Services

- 6.45 Whilst the site is not directly served by rail, connections can be accessed at Elsecar station, which is approximately 3.2km southeast of the site. The station is situated on the Hallam and Penistone lines served by Northern Rail. At peak times, the station provides two direct services

per hour services to Barnsley and Sheffield and intermediate local stations, plus one direct hourly service to Leeds. It should be noted that the Number 66,67a,72 and X2 bus services, which stop within close proximity of the site, provides a connection to the station.

Pedestrian and Cycle Infrastructure

Pedestrian Facilities

- 6.46 Within the vicinity of the development, all roads which provide key walking routes to the site have footways with street lighting. Road crossings are provided by means of a mixture of formal (signal-controlled crossings with traffic signals) and uncontrolled crossing points (dropped kerbs) located at points on the local highway network where there is an adjacent footway.
- 6.47 In addition, pedestrian facilities within the wider vicinity are indicated in appendix J (Figure 2) and described as follows:
- 6.48 A footpath located along the northern edge of Tankersley Lane provides a continuous pedestrian connection between the residential areas of Hoyland and Tankersley.
- 6.49 To the north, a series of pedestrian footpaths and crossing facilities (signalised crossings and dropped kerbs) are provided surrounding Birdwell Roundabout, allowing for pedestrian connections towards local amenities and bus stops.
- 6.50 Footways are located along either side of the A6195 Sheffield Road, with a pedestrian crossing point located approximately 90m to the north of the junction with Tankersley Lane. Bus stop infrastructure is also located along the A6195.
- 6.51 A number of Public Rights of Way (PRoW) exist within close proximity to the development site, as below:
- 6.52 Footpath 12 runs along the east of the development, connecting Sheffield Road to Tankersley Lane.
- 6.53 Footpath 26 runs along the south of the development boundary, connecting the A6135 with Black Lane and Bridleway 25 which runs from Black Lane towards B6090 Dike Hill.
- 6.54 To the north east of the development Cross Keys Lane provides access to Footpath 10 and Footpath 1 which form part of the pedestrian facilities within the Hoyland North Masterplan.
- 6.55 Additional PRoW's exist within convenient walking distance of the development; however, it is unlikely that employees will use these to access the development.

Cycling

- 6.56 National Cycle Network Route 67 runs to the west of the development site along New Road/ Tankersley Lane and can be accessed from the development land via Tankersley Lane. The route provides a mixture of traffic-free and on-road routes north towards Barnsley, and south towards Sheffield and Rotherham. The route also forms part of the Trans Pennine Trail, which covers a whole network of routes linking the major urban centres of the region.
- 6.57 In addition, local routes are available in the immediate vicinity of the site, with the A6135 Hoyland Common to Elsecar Park & Ride B6097 route runs within close proximity to the eastern boundary of the site, providing a cycle route between Parkside Road towards Elsecar rail station.

Future Baseline

Highway Network

6.58 The approach to considering the operation of the highway network in the future assessment scenarios is set out in full in the Transport Assessment; however, it can be summarised as follows:

- A future assessment year of 2029 has been assumed for the purposes of the Transport Assessment work, representing a reasonable timescale for construction and occupation of the development.
- Traffic growth is estimated on the basis of TEMPro growth factors to 2029.
- Traffic associated with a series of committed and proposed developments has been taken into account in the assessment of the future baseline scenario.
- It is understood that there are no infrastructure works proposed or committed by other parties, which would have a significant impact on the operation of the highway network within the study area.

Public Transport / Pedestrian and Cycle Infrastructure

6.59 It is understood that there are no works proposed or committed by other parties, which would have a significant impact on the operation of the public transport networks, or pedestrian or cycling provision within the study area.

Identification of Likely Effects

Operation of the Highway Network

6.60 Vehicular access to the development will be taken from the new link road through the site. It is anticipated that the access junctions will be provided to the individual development plots as part of an initial phase of site preparation works. Capacity assessment presented in chapter 8 of the Transport Assessment and AECOM's modelling report demonstrates that the proposed layout would satisfactorily accommodate changes in traffic flows associated with the completed development safely and efficiently.

Construction

6.61 The precise construction programme and method is not confirmed at this stage, therefore no specific detail in terms of the number of vehicles likely to be generated by the construction process is available at this stage. Vehicle movements generated by the construction works are likely to be associated with the delivery of plant and construction materials, as well as construction staff travelling to and from the Site. In the absence of detailed information, a qualitative assessment will determine the likely significant effects of construction traffic.

Operational Development

6.62 The full methodology detail is presented in the TA and is summarised as follows. To establish forecast traffic flows in the 2029 future year without the development taking place, predicted traffic associated with all known committed developments have been added to 2019 Base traffic data. The resulting 2029 Do Minimum traffic flows represent a future 'baseline' situation.

- 6.63 To estimate changes in traffic flows associated with the Development, vehicle trip rates were calculated using the TRICS database and from a traffic survey undertaken at Hermes Rugby, as agreed with BMBC and HE. The resulting vehicle trip generation was assigned to routes on the highway network surrounding the Site using a trip distribution derived from 2011 Census data and agreed with BMBC and HE.
- 6.64 The likely significant effects of the development are determined by comparing the 2029 Do Minimum scenario with the 2029 With development scenario, using the significance criteria below.

Significance of Identified Effects

- 6.65 The significance of an effect is derived from a measurement of the magnitude (or scale) of the change and the sensitivity and/or importance of the receptors affected. Categories of sensitivity and magnitude are defined and assessed to determine the significance of the effect.
- 6.66 The magnitude of change and the sensitivity of the affected receptor are assessed on a scale of high, moderate, low and negligible. Where an effect is considered to be non-significant, or have no influence irrespective of other effects, this is classified as 'negligible'.
- 6.67 The significance of the potential effects of the proposed development as a result of transportation have been determined using criteria developed from best practice techniques.

Magnitude of Effect

- 6.68 The IEMA guidelines identify a number of environment effects that may arise from changes in vehicular travel demand and set out the broad principles of how to assess the magnitude of effect for each category. This is summarised below:
- **Severance** – This is the perceived division that can occur within a community when it becomes separated by a major artery. Such division may result from the crossing of a heavily trafficked road or a physical barrier created by the road itself. The measurement and prediction of severance is difficult, but relevant factors include road width, traffic flow, vehicle speed, the presence of crossing facilities and the number of pedestrian movements across the affected route. The IEMA guidelines refer to the Manual of Environmental Appraisal, which suggests that changes in traffic flow of 30%, 60% and 90% would be likely to produce 'slight', 'moderate' and 'substantial' changes in severance, respectively. It is advised that these broad indicators should be used with care and regard paid to specific local conditions, in particular, the location of pedestrian routes to key local facilities and whether or not crossing facilities are provided;
 - **Driver Delay** – The IEMA guidelines note that driver delay can occur at several points on the network, although the effects are only likely to be significant when the traffic on the highway network is predicted to be at, or close to, the capacity of the system. For the purposes of this assessment, values of driver delay have been derived from the following junction capacity assessment programs: Junctions 9 for priority junctions; and LinSig or TRANSYT for signal-controlled junctions;
 - **Pedestrian Delay** – The IEMA guidelines note that a change in the volume, composition and/or speed of traffic may affect the ability of a person to cross a road. Typically, an increase in the traffic level results in increased pedestrian delay, although increased pedestrian activity itself may also contribute. The guidelines do not set any thresholds for assessing pedestrian delay, recommending instead that assessors use their judgement to determine the significance of the effect;

- **Pedestrian Amenity** – This is broadly defined as the relevant pleasantness of a journey. It is affected by traffic flow, traffic composition, footway width and separation from the carriageway. The IEMA guidelines suggest a tentative threshold for judging the significance of a change in pedestrian amenity where the traffic flow (or the heavy good vehicles (HGV) component) is halved or doubled;
- **Fear and Intimidation** – The impact of fear and intimidation is dependent upon the volume of traffic, the HGV composition, the proximity of traffic to people and the lack of protection caused by factors such as narrow footway width. The IEMA guidelines state that there are no commonly agreed thresholds for estimating fear and intimidation from known traffic and physical conditions, but it does nevertheless suggest some thresholds which could be used, based on previous research. These are shown in Table 6.1 below.

Degree of Hazard	Average hourly traffic flow over 18-hour day	Total 18-hour HGV flow	Average vehicle speed over 18-hour day (mph)
Extreme	>1800	>3000	<20
Great	1200-1800	2000-3000	15-20
Moderate	600-1200	1000-2000	10-15
Negligible	<600	<1000	<10

Table 6.1: Fear and Intimidation Thresholds

- **Accidents and Safety** – The IEMA guidelines do not include a definition in relation to accidents and safety, suggesting that professional judgement will be needed to assess the implications of local circumstance or factors which may increase or decrease the risk of accidents, e.g. junction conflicts.

6.69 From the IEMA guidelines, it should be noted that a projected change in traffic flow of less than 10% is generally considered to create no discernible environmental impact given that daily variations in background traffic flow may fluctuate by this amount under normal operating conditions.

Receptors and Receptor Sensitivity

6.70 The IEMA guidelines identify groups, locations and areas which may be sensitive to changes in traffic conditions and which should be considered for assessment. These are set out below:

- People at home.
- People at workplaces.
- Sensitive groups, including: children, the elderly and disabled,
- Sensitive locations, e.g. hospitals, churches, schools and historic buildings.
- People walking.
- People cycling,
- Open spaces, recreational sites and shopping areas,
- Sites of ecological/natural conservation value.

- Sites of tourist/visitor attraction.

6.71 Categories of receptor sensitivity have been defined as follows:

- The need to identify particular group or locations which may be sensitive to changes in traffic conditions.
- The list of affected groups and special interests set out in the IEMA guidelines.
- The identification of links or locations where it is felt that specific environmental problems may occur. Such locations would include accident black spots, conservation areas, hospitals, links with high pedestrian flows etc.

6.72 These categories have been used to outline, in broad terms, the sensitivity of receptors to traffic for the types of effect assessed in this chapter, although each receptor assessed will have a different sensitivity to each specific effect.

6.73 Table 6.2 below provides a summary of the sensitivity of receptors, categorised either as high, moderate or low.

Category	Receptor Sensitivity	Receptor Type
High	The receptor has little ability to absorb change without fundamentally altering its present character or is of international or national importance.	Schools, colleges, playgrounds, accident black spots, retirement homes, roads used by pedestrians with no footways.
Moderate	The receptor has moderate capacity to absorb change without significantly altering its present character or is of high importance.	Congested junctions, surgeries and clinics, hospitals, shopping areas with roadside frontage, roads used by pedestrians with narrow footways, parks and recreational areas.
Low	The receptor is tolerant of change without detriment to its character or is of low or local importance.	Places of worship, public open space, tourist/visitor attractions and residential and employment areas with adequate footway provision.

Table 6.2: Sensitivity of Receptors

6.74 The significance of the effect is judged on the relationship of the magnitude of the effect and the sensitivity and/or importance of the receptor. A matrix of the significance of the effects is set out in Table 6.3. The effects have the potential to be adverse, beneficial or negligible.

Sensitivity of Receptor	Magnitude of Effect			
	High	Moderate	Low	Negligible
High	Major	Major	Moderate	Negligible

Moderate	Major	Moderate	Minor	Negligible
Low	Moderate	Minor	Negligible	Negligible

Table 6.3: Criteria for Assessing Effect Significance

- 6.75 The following terms have been used to define the significance of the effects identified:
- Major effect – where the development could be expected to have a very significant effect (either positive or negative) on the existing environment.
 - Moderate effect – where the development could be expected to have a noticeable effect (either positive or negative) on the existing environment.
 - Minor effect – where the proposed development could be expected to result in a small, barely noticeable effect (either positive or negative) on the existing environment.
 - Negligible effect – where no discernible effect is expected as a result of the Proposed development on the existing environment.
- 6.76 Moderate and major effects are considered to be ‘significant’ for the purposes of this assessment.
- 6.77 In the context of the Development, short (up to 24 months duration) to medium (up to 48 months duration) term effects are generally determined to be those associated with construction activities (see Chapter 3: Description of Development, Remediation and Construction for further details), and the long-term effects are those associated with the completed and occupied Development.
- 6.78 Although not explicit in the matrix in Table 6.3, duration has, where required, been accounted for in the assessment, for example, whether the effects are permanent or temporary, and if temporary, over what time period.

Cumulative Impacts

Construction Phase

- 6.79 A contractor has not yet been appointed to undertake the construction works. Therefore, no specific detail in terms of the number of vehicles likely to be generated by the construction process is available at this stage.
- 6.80 Vehicle movements generated by the construction process are likely to be associated with the delivery of plant and construction materials, as well as construction staff travelling to and from the Site. Consequently, the movement of construction traffic may result in temporary adverse effects on the operation of the local road network (in terms of pedestrian and driver delay on the main access routes to and from the Site) and may also adversely affect pedestrian amenity, severance, fear and intimidation, and accidents and safety. In addition, construction vehicles could carry mud or dust on to the local road network.
- 6.81 The potential residual effects of construction traffic on the main routes to and from the Site are therefore considered to be temporary, short term and of minor adverse significance

Completed Development**Highway Network**

- 6.82 The development would generate an estimate 329 and 268 two-way trips in the AM and PM peak hours. Once these trips are distribution onto the local highway network the impact will be minimal, beyond the link road running through the development. The proposed development will remove trips through Hoyland. As such, the development once completed represents a direct, permanent, long term effect of negligible significance in terms of the highway network in Hoyland.

Location	Link	2029 Do Min		2029 With Dev		Percentage Difference	
		Veh	HGV	Veh	HGV	Veh	HGV
A	M1 North off-slip	14,595	836	15,261	1,222	5%	46%
A	M1 North on-slip	16,247	994	16,841	1,333	4%	34%
B	M1 South off-slip	12,968	699	13,415	940	3%	34%
B	M1 South on-slip	13,836	886	14,236	1,096	3%	24%
C	New Road	3,782	76	3,820	76	1%	0%
D	Tankersley Lane	4,154	28	4,563	28	10%	0%
E	Sheffield Road	16,583	648	11,820	402	-29%	-38%
F	Sheffield Road	16,583	648	11,820	402	-29%	-38%
G	Sheffield Road	13,226	406	2,656	44	-80%	-89%
H	Sheffield Road	12,828	406	2,423	44	-81%	-89%
I	Sheffield Road	12,828	406	14,554	677	13%	66%
J	Tankersley Lane (west of new link road)	7,069	62	7,515	62	6%	0%
K	A61 (North of The Walk, Birdwell)	23,114	1,020	23,562	1,146	2%	12%
L	Link Road (southern Access)	N/A	N/A	12,905	633	N/A	N/A

M	Link Road (south Tankersley Lane)	N/A	N/A	14,926	2,309	N/A	N/A
N	Link Road (north Tankersley Lane)	N/A	N/A	17,419	2,375	N/A	N/A
O	Link Road (northern Access)	N/A	N/A	17,704	2,484	N/A	N/A
17	M1 southbound (south of J36)	58,472	4,525	58,872	4,735	1%	5%
18	M1 northbound (south of J36)	57,373	4,525	57,820	4,765	1%	5%
19	M1 northbound (north of J36)	60,652	4,820	61,246	5,158	1%	7%
20	M1 southbound (north of J36)	59,231	4,475	59,897	4,861	1%	9%
21	M1 northbound (Through / under J36)	44,405	3,825	44,405	3,825	0%	0%
22	M1 southbound (Through / under J36)	44,636	3,639	44,636	3,639	0%	0%

Table 6:4: Future Year Traffic Data (24hr AADT)

- 6.83 As can be seen from Table 6.4, traffic flows in the 2029 with development scenario are not predicted to be significantly different from the 2029 Do Minimum scenario. None of the links in the study area are predicted to experience an increase in traffic flows of more than 13% following the introduction of traffic from the Development. Whilst there are significant decreases in vehicles along Sheffield Road and through Hoyland crossroads as a result of the new link road.

Severance

- 6.84 The IEMA guidelines suggest that changes in traffic flow of 30%, 60% and 90% would be likely to produce 'slight', 'moderate' and 'substantial' changes in severance, respectively. However, regard should be paid to local conditions, in particular, the location of pedestrian routes to key local facilities and whether or not crossing facilities are provided.
- 6.85 Examining the daily flows in the 2029 future year with the development, there are no roads in the study area that are predicted to exceed a change in traffic flows above the thresholds

suggested by the IEMA guidelines. Indeed, in comparison with the 2029 Do Minimum scenario, the maximum change in traffic flow in the 2029 With development scenario is an increase of up to 13%. This increase is substantially less than the thresholds of change suggested by the IEMA guidelines for measuring severance. The likely effect of the development on all links in the study area, in terms of severance, is therefore considered to be of negligible significance.

Driver Delay

- 6.86 The IEMA guidelines note that driver delay can occur at several points on the network, although the effects are only likely to be significant when the traffic on the highway network is predicted to be at, or close to, the capacity of the system.
- 6.87 Capacity assessments for the access junctions in the study area have been undertaken to compare the situation in the 2029 future year, with and without the Development. This indicates that the local junctions in the study area will operate with spare capacity in the 2029 future year, regardless of whether the development is brought forward.
- 6.88 The results of the modelling assessments, as presented within the TA, show that for each access junction in the study area, the changes in traffic flows associated with the development will have a negligible effect on driver delay in the 2029 future year. The likely effect of the development across the study area, in terms of driver delay, is therefore considered to be of negligible significance.

Pedestrian Delay

- 6.89 The IEMA guidelines note that a change in the volume, composition and/or speed of traffic may affect the ability of a person to cross a road. The guidelines do not set any thresholds for assessing pedestrian delay, recommending instead that assessors use their judgement to determine the significance of the effect.
- 6.90 In relation to the development, it has been previously identified that the maximum predicted change in traffic flow in the 2029 future year as a result of the development is a maximum increase of just 13%. The 13% increase in traffic flow is along Sheffield Road, south of the proposed new roundabout where footways are only present along one side of the carriageway as pedestrian movements are limited. Therefore the increase in traffic at this location will have minimal impact upon pedestrian delay. The speed of traffic across the study area is unlikely to be materially affected by the Development. The significant reduction of traffic through Hoyland crossroads will have a minor beneficial impact on pedestrian delay.
- 6.91 The IEMA guidelines note that a projected change in traffic of less than 10% is generally considered to create no discernible environmental impact, given that daily variations in background traffic flow may fluctuate by this amount under normal operating conditions. Overall the likely effect of the development on all links in the study area, in terms of pedestrian delay, is therefore considered to be of negligible significance.

Pedestrian Amenity

- 6.92 The IEMA guidelines suggest a tentative threshold for judging the significance of a change in pedestrian amenity where the traffic flow or the HGV component is halved or doubled. Pedestrian amenity is also affected by footway width and separation from the carriageway.
- 6.93 As previously identified, the maximum predicted change in traffic flow in the 2029 future year as a result of the development is a maximum increase of 13%. However there is also a

maximum decrease in traffic flow of 81% along Sheffield Road, as a result of the new link road which removes a significant number of vehicles off Sheffield Road. The likely effect of the proposed development on all links in the study area, in terms of pedestrian amenity, is therefore considered to be of beneficial significance.

Fear and Intimidation

- 6.94 The IEMA guidelines suggest some tentative thresholds for judging the significance of a change in fear and intimidation based on the volume of traffic, the HGV composition and the speed of vehicles.
- 6.95 It is predicted that the speed of traffic across the study area will not be materially affected by the development and therefore vehicle speed data has not been presented. Table 6.4 identifies that there is no predicted change in the level of fear and intimidation as a result of increased vehicular traffic flows, however some links will experience an increase of HGV's associated with the development. The likely effect of the development on all links in the study area, in terms of fear and intimidation, is therefore considered to be of negligible significance.

Accidents and Safety

- 6.96 An assessment of road traffic accident data for a five-year period has been undertaken for the purpose of this ES. The data shows that across the study area, the level of reported accidents is not uncommon for the characteristics of the road network. Furthermore, the number of accidents does not suggest a specific issue at any particular location.
- 6.97 It has been previously identified that the development is predicted to result in a change of traffic flows of no more than 13% for all links in the study area, whilst all but one link experiences a change in traffic flows of no more than 10%. The IEMA guidelines note that a projected change in traffic of less than 10% is generally considered to create no discernible environmental impact, given that daily variations in background traffic flow may fluctuate by this amount under normal operating conditions.
- 6.98 On the basis of the above, the likely effect of the development on all links in the study area, in terms of accidents and safety, is considered to be of negligible significance.

Mitigation and Monitoring Measures

Construction Phase

- 6.99 Potential construction phase effects will be mitigated, as far as possible, through the CEMP and CTMP which will be secured through planning conditions and would require the method of working to be approved by BMBC highways.
- 6.100 The likely residual effects of the construction phase on the operation of the highway network is therefore considered to be of minor adverse effect.

Highway Network

- 6.101 Given the nature of the development and the embedded mitigation in the form of the provision of the new link road, it will not lead to significant increases in traffic flows on the highway network, in fact it will reduce traffic flows passing through Hoyland. Overall, the development is considered to have a direct, permanent, long term effect of negligible significance on the operation of the highway network in Hoyland and a minor beneficial impact at Hoyland

Crossroads. As such, no additional mitigation measures in terms of the transport network are considered necessary to accommodate the Development. The likely residual effects of the development on the operation of the highway network are of direct, permanent, long term, negligible significance.

Severance

- 6.102 The likely effect of the development on all links in the study area, in terms of severance, has been identified as being of negligible significance. Hoyland village will experience a reduction in traffic flow as a result of the new link road, and this will be a minor beneficial impact. No mitigation is therefore required and the likely residual effect of the Development on severance is considered to be negligible significance.

Driver Delay

- 6.103 Across the study area, the likely effect of the development in terms of driver delay has been identified as being of negligible significance. No mitigation is therefore required and the likely residual effect of the development across the study area, in terms of driver delay, is considered to be of negligible significance.

Pedestrian Delay

- 6.104 The likely effect of the development on all links in the study area, in terms of pedestrian delay, has been identified as being negligible significance. No mitigation is therefore required and the likely residual effect of the Development on pedestrian delay is considered to be of negligible significance.

Pedestrian Amenity

- 6.105 The likely effect of the development on all links in the study area, in terms of pedestrian amenity, has been identified as being of beneficial significance. No mitigation is therefore required and the likely residual effect of the development on pedestrian amenity is considered to be of beneficial significance.

Fear and Intimidation

- 6.106 The likely effect of the development on all links in the study area, in terms of fear and intimidation, has been identified as being negligible significance. No mitigation is therefore required and the likely residual effect of the development on fear and intimidation is considered to be of negligible significance.

Accidents and Safety

- 6.107 The likely effect of the development on all links in the study area, in terms of accidents and safety, has been identified as being of negligible significance. No mitigation is therefore required and the likely residual effect of the development on accidents and safety is considered to be of negligible significance.

Summary

- 6.108 This chapter was prepared by Fore Consulting to assess any potentially significant environmental effects that could arise from the changes change in traffic flows during the construction and operational phases of the development. The assessment has been

undertaken in accordance with the IEMA guidelines. The methodology behind the preparation of the TA is also discussed.

- 6.109 The assessment of operational traffic impacts concluded that there were no link locations that are predicted to encounter significant increases in traffic as a result of the development.
- 6.110 The implementation of a Construction Traffic Management Plan will ensure the impact of additional HGVs during the construction period is kept to a minimum and the implementation of a Travel Plan will encourage and promote sustainable travel to the development once operational.
- 6.111** The results of this assessment have indicated that the potential environmental effects resulting from the increase in traffic generated by the development are predicted to be **minor or negligible**.

7. Ecology and Associated Loss of Habitat

Methodology and Assessment Criteria

- 7.1 This chapter assesses the likely significant effects of the development on the environment in respect of biodiversity and ecology. This assessment sets out the methods used to assess the baseline conditions currently existing at the Site and surroundings, the potential direct and indirect impacts of the development on biodiversity, the mitigation required to prevent, reduce or off-set the impacts and the cumulative and residual impacts. The assessment is set within the relevant planning and legislative context applicable to ecological and nature conservation resources.

Approach

- 7.2 All survey methodologies used within the assessment followed the published guidelines as accepted by the statutory and non-statutory agencies, including Natural England (NE) and the Chartered Institute for Ecology and Environmental Management (CIEEM). This Ecological Impact Assessment (EclA) follows the standard current guidance in place at the time of writing in 2020, as set out by CIEEM, 2018 and as recommended by NE.
- 7.3 For the purposes of this chapter the term 'Site' refers to all land within the red line boundary as shown in Appendix A. The term 'Study Area' relates to the areas covered by the ecological and desk-based surveys which vary as appropriate for the ecological feature being considered, due to its sensitivity, size of home range etc., as well as the nature of predicted impacts. The study areas used for the desk study are defined below.
- 7.4 The site was initially surveyed in winter 2019/20 at which time an Extended Phase 1 Habitat Survey was undertaken, with a series of faunal surveys and further habitat assessment undertaken in 2020.
- 7.5 Bat surveys are ongoing and as a consequence this assessment is based on initial spring survey data. Should the summer and autumn surveys provide additional data of significance a supplement to this assessment will be provided with an assessment of impacts and mitigation clearly provided.

Methodology

- 7.6 An ecological desk study was completed to collate current baseline data from statutory and non-statutory sources. The following data were gathered:
- Records of statutorily designated sites of international importance (Special Areas of Conservation (SAC), Special Protection Areas (SPA) and Ramsar sites), national/regional (Sites of Special Scientific Interest (SSSI)), or local importance (Local Nature Reserves (LNR)) within 10km, 2km and 1km of the Site respectively.
 - Records of non-statutorily designated sites for nature conservation (Local Wildlife Sites (LWS) within 1km of the Site
 - Habitats of importance for nature conservation within or adjacent to the Site, including ancient woodlands and *Habitats for Principal Importance* (HPI) listed under S.41 of the Natural Resources and Environment Act Act 2006 (NERC Act).

- 7.7 Records within 1km of the Site of legally protected and notable species (including *Species of Principal Importance* (SPI)) listed under S.41 of the NERC Act.
- 7.8 Information was sourced from Sheffield Biological Records Centre (SBRC). Online resources, including data available through the Multi-Agency Geographic Information for the Countryside website (www.magic.gov.uk) were also used to supplement the baseline data and reviewed in order to gain an overview and identify features of interest in the wider landscape.
- 7.9 Results of the desk study are summarised at Tables 7.6 and 7.7 and illustrated at Appendix I ref: 7.1 (Figure 1).

Field Survey

- 7.10 An Extended Phase 1 Habitat Survey of the Site was carried out in accordance with the standard Joint Nature Conservation Committee (JNCC) methodology (JNCC, 2010) in December 2019 and February 2020. Details of the methodology are presented within the Ecological Appraisal at Appendix K, section 7.1.
- 7.11 Hedgerows were initially surveyed using the Hedgerow Evaluation and Grading System (HEGS) (Clements, D. and Toft, R. 1992) with a more detailed assessment following in May 2020 against the Wildlife and Landscape criteria of the Hedgerow Regulations 1997.
- 7.12 Detailed fauna surveys were carried out in accordance with the relevant survey methodology for that species as recommended by CIEEM and NE. Methodologies used are presented within the relevant technical report for that species at Appendix K sections 7.2 – 7.6 .
- 7.13 Detailed survey methodologies for faunal surveys undertaken, and any limitations encountered, are provided in the species-specific reports in Appendices K sections 7.1 – 7.6. A summary of the surveys undertaken is provided in Table 7.1 below.

Appendix sub reference	Survey	Dates
7.1	Ecological Appraisal Habitat survey (JNCC, 2010) and badger survey (Harris, Creswell and Jefferies, 1991)	11/12/19, 06/02/20, 29/04/20, 06/05/20
7.2	Great Crested Newt and Reptile Report Presence/absence survey as described in the Great Crested Newt Mitigation Guidelines (English Nature 2001) Reptile survey in accordance with methodology detailed in the Herpetofauna Workers Manual (Gent and Gibson 1999) and the Froglife Advice Sheet 10 - Reptile Survey (Froglife 1999).	07/04/20, 20/04/20, 28/04/20, 05/05/20 08/04/20, 15/04/20, 21/04/20, 06/05/20, 14/05/20, 20/05/20, 29/05/20
7.3	Wintering Bird Report Winter bird surveys with the methodology broadly based on that of Territory Mapping as used for the British Trust for Ornithology (BTO) Common Bird Census (CBC).	11/12/19, 23/12/19, 15/01/20, 06/02/20
7.4	Breeding Bird Survey Report Breeding bird surveys with the methodology broadly based on that of Territory Mapping as used for the	08/04/20, 07/05/20, 10/06/20

Appendix sub reference	Survey	Dates
	British Trust for Ornithology (BTO) Common Bird Census (CBC).	
7.5	Interim Bat Report Activity Surveys (transects) in May and June Automated Static Bat Detector Survey with one static detector deployed in May and June in strategic locations within site. Nocturnal building survey in June covering buildings identified as supporting bat roost potential. All methods based on the methods outlined in the Bat Surveys Good Practice Guidelines (3 rd edition) (BCT 2016).	18/05/20, 09/06/20 15/06/20

Table 7.1: Technical Report Appendices**Ecological Evaluation**

7.14 CIEEM guidance for EclA recognises that evaluation is a complex process and that a range of factors need to be considered in attributing value to ecological features. Various characteristics can be used to identify features that are likely to be important in terms of biodiversity, including:

- Naturalness;
- Animal or plant species that are rare or uncommon, either internationally, nationally or more locally;
- Ecosystems and their component parts which provide the habitats required by the above species, populations and/or assemblages;
- Endemic species or locally distinct sub-populations of a species;
- Habitat diversity, connectivity and/or synergistic associations (e.g. networks of hedgerows and areas of species-rich pasture that provide important feeding habitat for a rare species, such as greater horseshoe bat);
- Plant communities (and their associated animals) that are considered to be typical valued natural/semi-natural vegetation types – these will include examples of naturally species poor communities;
- Species on the edge of their range, particularly where their distribution is changing as a result of global trends and climate change;
- Species rich assemblages of plants and animals;
- Typical faunal assemblages that are characteristic of homogenous habitats.

- 7.15 The ecological features that may be affected by the development have been evaluated within a geographical framework based on the ecological status of the features, but which also reflects a wide range of legislation and governmental guidance. The significance of impacts is then assessed based on this frame of reference (indicated in Table 7.2).

Level of Value	Example
International and European	An internationally or European designated site or candidate site (SPA, pSPA, SAC, cSAC, pSAC, Ramsar site, Biogenetic Reserve) or an area which meets the published selection criteria for such designation, irrespective of whether or not it has yet been notified. A viable area of a habitat type listed in Annex I of the Habitats Directive or smaller areas of such habitat which are essential to maintain the viability of a larger whole. Any regularly occurring population of an internationally important species, which is threatened or rare in the UK (i.e. it is a UK Red Data Book species or listed as occurring in 15 or fewer 10km squares in the UK) or of uncertain conservation status or of global conservation concern. A regularly occurring, nationally significant population/number of any internationally important species.
National	A nationally designated site (SSSI, NNR, Marine Nature Reserve) or a discrete area, which meets the published selection criteria for national designation (e.g. SSSI selection guidelines) irrespective of whether or not it has yet been notified. A viable area of a priority habitat identified as a habitat of Principal Importance or smaller areas of such habitat which are essential to maintain the viability of a larger whole. Any regularly occurring population of a nationally important species which is threatened or rare in the region or county (local BAP). A regularly occurring, regionally or county significant population/number of any nationally important species.
Regional (i.e. North)	Viable areas of key habitat identified in the Regional BAP or smaller areas of such habitat which are essential to maintain the viability of a larger whole. Viable areas of key habitat identified as being of Regional value in the appropriate Natural Area profile. Any regularly occurring, locally significant population of a species listed as being nationally scarce which occurs in 16-100 10km squares in the UK, or in a Regional BAP or relevant Natural Area on account of its regional rarity or localisation. A regularly occurring, locally significant number of a regionally important species.

	Sites which exceed the County-level designations but fall short of SSSI selection guidelines, where these occur.
County (South Yorkshire)	Semi-natural ancient woodland greater than 0.25 ha. County/Metropolitan sites and other sites which the designating authority has determined meet the published ecological selection criteria for designation, including Local Nature Reserves selected on County/metropolitan ecological criteria (County/Metropolitan sites will often have been identified in local plans). A viable area of habitat identified in County BAP. Any regularly occurring, locally significant population of a species which is listed in a County/Metropolitan “red data book” or BAP on account of its regional rarity or localisation. A regularly occurring, locally significant number of a County/Metropolitan important species.
Local (with further sublevels as appropriate)	Areas of habitat considered to appreciably enrich the habitat resource within the context of the Parish or neighbourhood (e.g. species-rich hedgerows). Local Nature Reserves selected on Parish ecological criteria.

Table 7.2: Geographic Frame of Reference

7.16 Features with a value of Local or above were considered to represent ‘Important Ecological Features’ (IEF). Those features not meeting the criteria for IEFs were classified as having below local (that is, not considered to appreciably enrich the habitat resource at the local level, although they may provide some habitat diversity within the immediate context of the Site itself), or Negligible ecological importance. These features are excluded from further assessment given that impacts on such features are considered insignificant regardless of the nature or magnitude of the potential impact.

7.17 The likelihood that a change/activity will occur as predicted has a degree of confidence assigned. The categories of confidence used are provided in Table 7.3.

Level of Confidence	Estimated Probability
Certain / Near-Certain	Probability estimated at 95% chance or higher
Probable	Probability estimated below 95% but above 50%
Unlikely	Probability estimated below 50% but above 5%
Extremely Unlikely	Probability estimated at less than 5%

Table 7.3: Level of Confidence in Predictions

7.18 The impacts of the development have been predicted, taking into account different stages and activities within the development process. Impacts have been considered both individually and cumulatively. When describing impacts on an ecosystem, structure or function, reference is made to the terms as described in Table 7.4.

8.

	Definition of the parameter
Positive or Negative	Whether the impact has a positive or negative effect.
Extent	The area of which the impact occurs.
Magnitude	The size or amount of an impact.
Duration	The time for which the impact is predicted to last prior to recovery or replacement of the resource or feature.
Reversibility	Whether the impact is permanent (i.e. irreversible) or temporary (i.e. reversible).
Timing and Frequency	How often the impact occurs (e.g. repeated noise from piling work) and when it occurs (e.g. vegetation clearance undertaken outside of the bird breeding season).

Table 7.4: Terms used to describe impacts

8.1 The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (as amended) require that attention be paid to all likely forms of effects. These may be:

- Direct or indirect;
- Short or long-term;
- Intermittent, periodic or permanent; and
- Cumulative.

8.2 Potential effects prior to mitigation include:

- Direct loss of habitats and associated flora and fauna within the Site boundary, interruption of wildlife corridors, decrease in value to wildlife through reduction in species and/or habitats;
- Indirect effects on retained vegetation within and bordering the Site, through increase disturbance and through local changes in soils, drainage and hydrology;
- Potential effects upon protected and scarce species through disturbance;
- Operational effects such as pollution incidents from chemical spills, pollution of streams and fragile habitats from runoff and incorrect storage of materials; and
- Long-term effects arising as a result of the favourable restoration of the Site to beneficial after-use.

Magnitude

8.3 Magnitude of effects has been determined based on the following scales:

Magnitude of Impact	Criteria for assessing impact
Major	Total loss or major/substantial alteration to key elements/features of the baseline (pre-Development) conditions such that the post development character/composition/attributes will be fundamentally changed.

Moderate	Loss or alteration to one or more key elements/features of the baseline conditions such that post development character/composition/attributes of the baseline will be materially changed.
Minor	A minor shift away from baseline conditions. Change arising from the loss/alteration will be discernible/detectable but not material. The underlying character/composition/attributes of the baseline condition will be similar to the pre-development circumstances/situation.
Negligible	Very little change from baseline conditions. Change barely distinguishable, approximating to a 'no change' situation.

Table 7.5: Methodology for Assessing Magnitude

- 8.4 The ecological significance of any impact has been assessed, based upon the likely effect on the structure, function or conservation status of the feature. The assessment of impact significance is undertaken both to identify the need for mitigation and also to assess residual effects.

Significance criteria

- 8.5 The significance of likely effects was determined by identifying those ecological features likely to be affected. The features were evaluated to identify the important ones, i.e. those which, if their level of importance reduced, national or local policies (or in some cases legislation) would be triggered. The nature of the individual and combined impacts (positive or negative) were characterised on each important feature, to determine the longevity, reversibility and consequences for the feature in terms of ecological structure and function and/or the conservation status of a habitat or species. As part of the process of determining whether there is likely to be an effect on the integrity of a site or ecosystem, the following questions are considered:

- Will any site/ecosystem processes be removed or changed?
- What will be the effect on the nature, extent, structure and function of component habitats?
- What will be the effect on the average population size and viability of the component species?

- 8.6 Once an impact is considered to be significant then the scale of impact is assessed on a geographical scale (i.e. international, national, regional, county etc.) as above. For example, the impact may not be significant at a county scale but is significant at a more local scale. For the purposes of this Chapter, likely significant effects on IEFs are those identified as being of significance at a local or above level.

Mitigation, Compensation and Enhancement

- 8.7 For the purposes of the EclA, impacts on IEFs are assessed without mitigation in place. Mitigation or compensation is identified for significant impacts on features of nature conservation importance. In line with current CIEEM guidelines, the mitigation proposals for the development should aim to:

- Avoid negative ecological impacts – especially those that could be significant;
- Reduce negative impacts that cannot be avoided; and
- Compensate for any remaining significant ecological impacts.

- 8.8 Priority is given to avoidance of impacts, where possible, through design and/ or regulation of the development through aspects such as timing, storage of materials etc. Where this is not possible opportunities are sought to reduce the impacts as much as is feasible. If significant impacts cannot be avoided through mitigation, then compensation that is considered appropriate to offset the negative impacts of the development should be outlined. Where it is known to exist, evidence is supplied for the effectiveness of proposed mitigation or compensation.

Policy Context

National Planning Policy Framework

- 8.9 Paragraph 170 of the NPPF states that “Planning policies and decisions should contribute to and enhance the natural and local environment by:
- a) protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);*
 - b) recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland.”*
- 8.10 Paragraph 170 of the revised NPPF also states that:
- “d) minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures.”*
- 8.11 With regard to planning applications and biodiversity, Paragraph 175 of the NPPF states that:
- “When determining planning applications, local planning authorities should apply the following principles:*
- a) if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;*
 - b) development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;*
 - c) development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists; and*
 - d) development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to incorporate biodiversity improvements in and around developments should be encouraged, especially where this can secure measurable net gains for biodiversity.”*

- 8.12 In Paragraph 180, the revised NPPF advises that *“Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should: c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.”*

Local Planning Policy

- 8.13 The following local planning policies are of relevance to this assessment:
- 8.14 **Section 8 Economy** - the site comprises an employment allocation as follows, for which the individual policy below refers, in addition to the key strategic policy areas.
- 8.15 **Site ES 13** – Land West of Sheffield Road - Employment Allocation.
- 8.16 **Policy GI1** – the policy seeks to ensure that an integrated network of connected and multifunctional Green Infrastructure (GI). GI will be secured by protecting open space, creating new open spaces as part of new development and by using developer contributions to create and improve GI. The policy is supported by a Green Infrastructure Strategy.
- 8.17 **Policy GS1** - seeks to ensure a range of valuable green areas for differing needs, including those for wildlife and biodiversity, with any losses of green space replaced appropriately with an at least equivalent quality, quantity and accessibility. Existing green space is ranked to identify where improvements can be made and which areas should be afforded protection from development.
- 8.18 **Policy BIO1** - the policy seeks to protect and enhance existing habitats, species and sites of ecological value, including the key floodplains strategic wildlife corridors and maximise and provide biodiversity within new developments. Effective mitigation and/or compensation must be provided where loss of biodiversity features cannot be avoided. Of particular relevance to this assessment is the location of the eastern half of the proposed development area within the Dearne Valley Green Heart Nature Improvement Area. Enhancement and creation of linkages are encouraged to support the policy aims, alongside habitat creation. As well as ensuring no-net loss of biodiversity, developments within the NIA should include quantifiable, significant benefits such as:
- New woodland;
 - New wetland;
 - Enhancing areas of poor environmental quality;
 - Improving public access, or
 - Improving the management of existing habitat.
- 8.19 **Policy CC4** - Sustainable Drainage Systems. The use of SuDS to manage surface water drainage is sought. For this assessment, the value of SuDS as providing wildlife habitat and its contribution to local and wider GI is relevant.
- 8.20 The following Supplementary Planning Documents have been considered

- Trees and Hedgerows (May 2019)
- Biodiversity and Geodiversity (May 2019)

8.21 Also of relevance is the Local Biodiversity Action Plan (LBAP) for Barnsley detailing habitats and species of local importance.

Legislative Context

8.22 The following legislation and European Directives afford protection to wildlife and have been used to inform this assessment:

- Natural Environment and Rural Communities (NERC) Act 2006;
- Wildlife and Countryside Act (1981) (as amended);
- The EC Birds Directive (Directive 79/409/EEC), as translated into UK law by The Habitat and Species Regulations 2010 (as amended);
- The EC Habitats Directive (Directive 92/43/EEC) as translated into UK law by The Habitat and Species Regulations 2010 (as amended);
- The Protection of Badgers Act (1992); and
- The Hedgerow Regulations (1997).

Baseline Conditions

8.23 Extended Phase 1 Habitat Survey undertaken in winter 2019/20 and further survey in May 2020 recorded habitats dominated by large heavily cultivated arable fields bounded by native hedgerows, many, particularly internal hedgerows were gappy and of limited canopy diversity. A number of smaller species-poor grassland compartments were also recorded. Limited areas of plantation and semi-natural woodland, woodland edge and wet ditch were also recorded. The site was noted to provide some suitability for protected species including badgers, reptiles and birds. No permanent water bodies supporting standing water in late spring or early summer with suitability for breeding amphibians were recorded.

Desk Study

Designated Sites

8.24 Table 7.6 provides a summary of relevant nature conservation designations within the search areas. No local, national or international level statutory designations were returned for the search areas. Three non-statutory designations at a local level exist (one also a statutory Local Nature Reserve). A further Local Nature Reserve was also noted within 2km.

Site Name/Ref	Designation	Designation Feature	Size	Proximity to Site
Potter Holes Plantation/1166	Local Nature Reserve (LNR) and LWS	Semi-natural broadleaved woodland	8.45 ha	540m W

Skier's Spring Wood/657	Local Wildlife Site (LWS)	Ancient semi-natural woodland	9.79 ha	730m E
Black Lane/646	LWS	Species-rich hedgerows	0.38 ha	50m S (from SUDS infrastructure) 830m S (from employment development)
Dearne Valley Green Heart	Nature Improvement Area (NIA)	To restore and enhance ecological networks of the River Dearne, its floodplain and links to surrounding habitats. Reedbeds, wet and dry grassland, woodlands and reclaimed industrial areas and farmland created or enhanced.	16,000ha	Partially within and in the south western extent of the NIA

Table 7.6: Designated Sites within Zones of Influence

- 8.25 The Local Wildlife Sites are acknowledged as being of **County Significance**.
- 8.26 The identification of the Dearne Valley NIA does not infer any extant nature conservation value, but instead identifies some potential and as a consequence contains a range of project areas focused on restoring and enhancing the ecological networks of the river, its floodplain, and links to habitats on surrounding slopes and hills.
- 8.27 Table 7.7 provides a summary of the notable species recorded within the search area.

Species	Most recent record	Closest record	Records	Status
Amphibians				
Great crested newt <i>Triturus cristatus</i>	2014	On site	4	NERC, WCA, Priority
Reptiles				
Grass snake <i>Natrix helvetica</i>	2010	985m W	1	NERC, WCA, Priority
Mammals				
Brown long-eared bat <i>Plecotus auritus</i>	2009	160m W	1	ECCD, NERC, WCA, Priority
Common pipistrelle <i>Pipistrellus pipistrellus</i>	2015	190m SE	7	ECCD, WCA, Priority
Pipistrelle species <i>Pipistrellus</i> sp.	2016	40m E	1	ECCD, NERC, WCA, Priority

Whiskered bat <i>Myotis mystacinus</i>	2016	350m W	1	ECCD, WCA, Priority
Hedgehog <i>Erinaceus europaeus</i>	2016	590m E	1	NERC, WCA, Priority
Badger <i>Meles meles</i>	2017	Location not specified	2	PBA, WCA
Birds				
Bullfinch <i>Pyrrhula pyrrhula</i>	2018	80m S	4	NERC, Schedule 3, BOCC 4 (Amber), Priority
Dunnock <i>Prunella modularis</i>	2009	260m E	6	NERC, BOCC 4 (Amber), Priority
Fieldfare <i>Turdus pilaris</i>	2009	500m N	1	Schedule 1&4, BOCC 4 (Red)
House martin <i>Delichon urbica</i>	2003	340m E	1	BOCC 4 (Amber)
House Sparrow <i>Passer domesticus</i>	2009	265m NW	8	NERC, BOCC 4 (Red), Priority
Kestrel <i>Falco tinnunculus</i>	2016	160M W	3	Schedule 4, BOCC 4 (Amber)
Lapwing <i>Vanellus vanellus</i>	2005	270m W	1	NERC, BOCC 4 (Red), Priority
Lesser Redpoll <i>Acanthis cabaret</i>	2012	1km SW	1	NERC, BOCC 4 (Red), Priority
Mistle Thrush <i>Turdus viscivorus</i>	2000	160m W	1	BOCC 4 (Red)
Redwing <i>Turdus iliacus</i>	2009	500m N	1	Schedule 1&4, BOCC 4 (Red)
Reed Bunting <i>Emberiza schoeniclus</i>	2014	550m N	1	NERC, BOCC 4 (Amber), Priority
Skylark <i>Alauda arvensis</i>	2013	140m N	1	NERC, BOCC 4 (Red), Priority
Song Thrush <i>Turdus philomelos</i>	2018	80m S	8	NERC, Schedule 3(1), BOCC 4 (Red), Priority
Starling <i>Sturnus vulgaris</i>	2014	280m E	6	NERC, BOCC 4 (Red), Priority
Swift <i>Apus apus</i>	2018	On site	2	BOCC 4 (Amber)
Tawny Owl <i>Strix aluco</i>	2012	790m W	1	BOCC 4 (Amber)
Willow Tit <i>Poecile montana</i>	2015	530m E	1	NERC, BOCC 4 (Red), Priority
Yellowhammer <i>Emberiza citrinella</i>	2015	160m W	2	NERC, BOCC 4 (Red)

Invertebrates				
Dingy Skipper <i>Erynnis tages</i>	2016	660m E	2	NERC, RedList (Vulnerable), Priority
Cinnabar <i>Tyria jacobaeae</i>	2014	650m N	1	NERC
White Letter-hairstreak <i>Satyrus w-album</i>	2005	350m SW	1	NERC

Table 7.7: Protected and Notable Species Records

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), Red List- IUCN Red List 2001, Local Priority – Barnsley Biodiversity Action Plan 2009, BOCC – Birds of Conservation Concern 4 (red/amber)

Field Study

Habitats

- 8.28 Locations of habitats and target notes are illustrated in Appendix K. Table 7.8 describes the intrinsic nature conservation value of habitats recorded within the Site. Full descriptions of all habitats identified within the Site and immediate surrounds is provided in Appendix K, section 7.1.
- 8.29 Bell Ground (wood), although not within the site was included in the study area, given the potential for impact. Due to their presence on ground raised above the proposed development plantation woodland (on the M1 Motorway verge) and more limited semi-natural broadleaved woodland have been excluded from this assessment on the basis that impacts to root zones from adjacent development is considered unlikely and not deemed significant.

Habitat Type (JNCC, 2010)	Description	Valuation
Semi-natural Broadleaved Woodland	Large woodland compartment (Bell Ground (wood)) adjacent the Site and proposed landscape bunding. Dominated by common ash <i>Fraxinus excelsior</i> . Understorey dominated by wych elm <i>Ulmus glabra</i> . Small number of ancient woodland indicator species found occasionally including: wood millet <i>Milium effusum</i> , Enchanter's nightshade <i>Circaea lutetiana</i> , wood speedwell <i>Veronica montana</i> and wood dog's mercury <i>Mercurialis perennis</i> .	Local - Local Priority Habitats. Current value is restricted due to poor condition.
Plantation Broadleaved Woodland	Small semi-mature plantation associated with sports pitch. Dominated by wild plum <i>Prunus domestica</i> with a ground flora supporting cleavers <i>Galium aparine</i> and wood avens <i>Geum urbanum</i> .	Below Local – Restricted diversity and limited extent.
Continuous / scattered scrub	Single compartment of mature hawthorn <i>Crataegus monogyna</i> scrub and further discrete hawthorn and bramble <i>Rubus fruticosus</i> associated with field boundaries.	Below Local – Restricted diversity and limited extent.

Broadleaved Trees	Small number of mature pedunculate oak <i>Quercus robur</i> and goat willow <i>Salix caprea</i> as well as ornamental trees associated with sports pitches.	Local - Local Priority Habitats. Current value is restricted due to limited extent and species/structural diversity.
Improved Grasslands	Short, mown grasslands dominated by perennial rye-grass <i>Lolium perenne</i> and associated with residential dwellings.	Negligible - Ubiquitous habitat, comprising common and widespread species.
Semi-improved Grasslands	Short heavily disturbed sheep and pony grazed compartments dominated by common and widespread grass species with a low diversity of herbs. Creeping bent <i>Agrostis stolonifera</i> and perennial rye-grass dominated and other frequent to occasional species included white clover <i>Trifolium repens</i> , ribwort plantain <i>Plantago lanceolata</i> and common sorrel <i>Rumex acetosa</i> .	Below Local – Restricted diversity (of structure and species) and limited extent.
Wet Ditches	Short and largely discrete sections supporting common grasses and herbs or scrub and drying in the summer. Bramble and greater willowherb <i>Epilobium hirsutum</i> noted.	Negligible - Ubiquitous habitat, comprising common and widespread species and a restricted extent.
Arable	Large heavily cultivated fields with narrow margins supporting common and widespread species and also regularly managed. False oat-grass <i>Arrhenatherum elatius</i> , common nettle <i>Urtica dioica</i> and broadleaved dock <i>Rumex obtusifolius</i> supported.	Negligible - Ubiquitous habitat, comprising common and widespread species
Amenity Grassland	Short mown turf with a tight sward and the majority also rolled. Supported a moderately diverse sward including lesser stitchwort <i>Stellaria graminea</i> . Common bird's foot trefoil <i>Lotus corniculatus</i> and cuckoo flower <i>Cardamine pratensis</i> and common knapweed <i>Centaurea nigra</i> .	Below Local – Restricted diversity (of structure and species) and limited extent.
Hedgerows	Eighteen hedgerows of moderate to low value due (according to HEGS criteria (Clement and Tofts, 1992)) to limited canopy diversity and structural/associated features.	Below Local – Restricted diversity of structure and species.
Hedgerows	Seven hedgerows of moderately high to high value (according to HEGS) due to relatively greater canopy diversity and/or structural/associated features.	Local - Local Priority Habitats. Current value is somewhat restricted due to limited connectivity and/or structural/species diversity.

Table 7.8: Habitat Types Recorded within the site

Protected and Notable Fauna

- 8.30 Throughout the Extended Phase 1 Survey, consideration was given to the presence of protected species including, but not limited to, those protected under the Wildlife and Countryside Act 1981 (as amended), the Protection of Badgers Act 1992 and the Conservation of Habitats and Species Regulations 2017 (as amended). Consideration was also given to the existence and use of the site by other notable fauna such as Species of Principal Importance NERC (2006), or Red Data Book (RDB) species. Full details of faunal surveys are provided in the accompanying ES Appendices 7.2-7.5.

Badgers

- 8.31 No evidence of badger setts was recorded within the site or in suitable habitat in the vicinity of its boundaries. Some limited evidence of use of the site by badgers (prints recorded at arable field margins) was noted. While the site provides some suitable habitat for this species greater suitability, in terms of foraging and extent, is present outside the site in areas that will be largely unaffected by proposals. The importance of the site for badgers is therefore considered to be of **Negligible Significance**.

Great Crested Newts

- 8.32 The full details of great crested newt (GCN) surveys are provided in Appendix K section 7.2. Surveys for GCN were undertaken in spring 2020 on waterbodies initially identified the previous winter and including one wet ditch (P10) within the development boundary and a section of flooded field, wet ditch and seven further waterbodies within 250m of the development boundary. Habitat Suitability Index (HSI) surveys undertaken during aquatic surveys are provided in Table 7.9.

Pond	HSI Score	Predicted Presence	HSI Category	Proximity to Site
P1	0.62	55%	Average	220m E
P2	0.62	55%	Average	134m E
P3	0.56	20%	Below Average	8m W
P4	Dry			
P5	0.72	79%	Good	230 W
P6	0.52	20%	Below Average	195m SW
P7	0.55	20%	Below Average	182m SW
P8	Dry			
P9	Dry			
P10	Dry			

Table 7.9: HSI Survey Results

8.33 Only one pond (P1) within the survey area supported water throughout the aquatic survey period and no permanent standing water was identified within the Site during this period (April – May). Of the remaining off site ponds that were surveyed, no GCN were recorded.

8.34 One pond, P5 (garden pond), was only visited on a single occasion due to health and safety concerns relating to Covid-19. This is not considered a limitation to this assessment, due to the distance of the pond from the proposals and intervening habitat (heavily cultivated arable land, which would significantly reduce the potential for GCN dispersal into the site and likelihood of impacts. The importance of the site for GCN is therefore considered to be of **Negligible Significance**.

Reptiles

8.35 Full details of reptile surveys are provided in Appendix K, section 7.2. Surveys were undertaken in spring 2020 and targeted suitable habitat within the development site and further areas of suitability to the south east with links to the development site.

8.36 A single juvenile grass snake was recorded within boundary scrub linked to Bell Ground (wood) at the southern development boundary. A low population of grass snake is considered to be present at low density and utilising suitable habitats within the development site. The importance of the site for grass snake population is considered to be of no more than **Local Significance**.

Winter Birds

8.37 A total of 48 bird species were recorded during winter bird surveys undertaken in 2019/20, 19 of which were considered to be notable species and these were recorded in low numbers with the most abundant of these being fieldfare *Turdus piliaris*, black-headed gull *Chroicocephalus ridibundus*, redwing *Turdus iliacus* and starling *Sturnus vulgaris*. Onsite habitats are considered to be of limited suitability for notable populations making up a small extent of suitable habitat present in the wider landscape. Full details of the winter bird survey results are present in Appendix K, section 7.3.

8.38 Table 7.10 details the notable species recorded on Site, which appear on at least one of the following lists, their recent status within Yorkshire and presence on the Barnsley Biodiversity Action Plan (BBAP):

- Schedule 1 of the Wildlife & Countryside Act 1981 (as amended);
- Section 41 of the Natural Environment and Rural Communities (NERC) Act (2006); and,
- Birds of Conservation Concern Red or Amber lists.

Species	Conservation Status	Peak Count / Survey Occasions Recorded	Recent Status within Yorkshire
Black-headed gull <i>Chroicocephalus ridibundus</i>	Amber list	130/4	A common breeder and abundant in winter
Bullfinch <i>Pyrrhula pyrrhula</i>	Amber list NERC ACT (S41)	3/2	An uncommon breeder; scarce winter passage migrant/winter visitor

Dunnock <i>Prunella modularis</i>	Amber list NERC ACT (S41)	3/4	An abundant resident and passage migrant
Fieldfare <i>Turdus pilaris</i>	Red list NERC ACT (S41) Sch. 1 WCA	50/3	Rare, occasional breeder in UK, common passage migrant and winter visitor
Grey wagtail <i>Motacilla cinerea</i>	Red list	1/1	Uncommon resident in north and west; scarce passage migrant.
Herring gull <i>Larus argentatus</i>	Red list NERC ACT (S41)	2/1	Fairly common resident breeder; common passage migrant and winter visitor
House sparrow <i>Passer domesticus</i>	Red list NERC ACT (S41)	colony/2	Abundant resident but has decreased
Kestrel <i>Falco tinnunculus</i>	Amber list BBAP	1/3	A fairly common resident and passing migrant
Lapwing <i>Vanellus vanellus</i>	Red List BBAP	3/1	Uncommon breeding resident; common passage migrant/winter visitor
Linnet <i>Carduelis cannabina</i>	Red list NERC ACT (S41)	1/1	Common resident and passage migrant
Mallard <i>Anas platyrhynchos</i>	Amber List BBAP	13/1	Fairly common breeder; common migrant and winter visitor
Mistle thrush <i>Turdus viscivorus</i>	Red list	2/4	Fairly common resident and scarce passage migrant
Redwing <i>Turdus iliacus</i>	Amber list Sch. 1 WCA	80/3	Common passage migrant and winter visitor
Reed bunting <i>Emberiza schoeniclus</i>	Red list NERC ACT (S41)	1/1	Fairly common breeding resident and passage migrant
Skylark <i>Alauda arvensis</i>	Red list NERC ACT (S41) BBAP	8/3	Common resident; passage migrant and winter visitor
Song Thrush <i>Turdus philomelos</i>	Red list NERC ACT (S41)	2/4	Common resident, passage migrant and winter visitor
Starling <i>Sturnus vulgaris</i>	Red list NERC ACT (S41)	80/3	Abundant but decreasing resident, passage migrant and winter visitor
Stock Dove <i>Columba oenas</i>	Amber List	15/1	Fairly common resident; some passage and immigration
Yellowhammer <i>Emberiza citrinella</i>	Red list NERC ACT (S41)	26/4	Fairly common resident and passage migrant

Table 7.10: Protected Species of Principal Importance, BoCC Red and Amber Listed Bird Species Recorded on site during Winter Bird Surveys 2019/20 and their Recent Status within Yorkshire.

- 8.39 As the assemblage mostly comprised common and widespread species in numbers typical of the habitats present, the site was considered to be of no more than **Local Significance** for its winter bird assemblage.

Breeding Birds

- 8.40 A total of 42 bird species were recorded during breeding bird surveys undertaken in 2020. Of the 42 species recorded 11 were confirmed as breeding including dunnock, house sparrow, lapwing, skylark, starling and yellowhammer. The remaining 5 confirmed breeding species all BoCC Green-listed species (low conservation concern).

- 8.41 The site was predominantly open heavily cultivated arable fields that supported limited breeding opportunities to the recorded assemblage. The species recorded were largely typical of heavily managed agricultural habitats. The majority of breeding activity was within field boundary hedgerows and scrub supporting both common and widespread species such as blackbird and wren and as well as notable species such as mistle thrush, dunnock and willow warbler. Central field compartment provided limited opportunities for breeders with the exception of low numbers of skylark and lapwing.

- 8.42 Table 7.11 details the notable species recorded on Site, which appear on at least one of the following lists, their recent status within Yorkshire and presence on the BBAP:

- Schedule 1 of the Wildlife & Countryside Act 1981 (as amended);
- Section 41 of the Natural Environment and Rural Communities (NERC) Act (2006); and,
- Birds of Conservation Concern Red or Amber lists.

Species	Conservation Status	Peak Count / Survey Occasions Recorded	Breeding Status
Black-headed gull <i>Chroicocephalus ridibundus</i>	Amber list	4/3	Non-breeder
Dunnock <i>Prunella modularis</i>	Amber list	2/3	Confirmed breeder
Herring gull <i>Larus argentatus</i>	Red list	1/1	Non-breeder
House sparrow <i>Passer domesticus</i>	Red list	Flock/3	Confirmed breeder
Kestrel <i>Falco tinnunculus</i>	Amber list BBAP	1/1	Non-breeder
Lapwing <i>Vanellus vanellus</i>	Red list BBAP	2/1	Confirmed breeder
Linnet <i>Carduelis cannabina</i>	Red list	2/1	Possible breeder
Mistle thrush <i>Turdus viscivorus</i>	Red list	1/1	Possible breeder

Skylark <i>Alauda arvensis</i>	Red list BBAP	3/3	Confirmed breeder
Song Thrush <i>Turdus philomelos</i>	Red list	1/2	Possible breeder
Starling <i>Sturnus vulgaris</i>	Red list	10/3	Confirmed breeder
Stock Dove <i>Columba oenas</i>	Amber list	5/2	Non-breeder
Swift <i>Apus apus</i>	Amber list	2/2	Non-breeder
Willow Warbler <i>Phylloscopus trochilus</i>	Amber list	1/2	Possible breeder
Yellowhammer <i>Emberiza citrinella</i>	Red list	3/3	Confirmed breeder
Black-headed gull <i>Chroicocephalus ridibundus</i>	Amber list	4/3	Non-breeder
Dunnock <i>Prunella modularis</i>	Amber list	2/3	Confirmed breeder
Herring gull <i>Larus argentatus</i>	Red list	1/1	Non-breeder
House sparrow <i>Passer domesticus</i>	Red list	Flock/3	Confirmed breeder

Table 7.11: Protected Species of Principal Importance, BoCC Red and Amber Listed Bird Species Recorded on site during Breeding Bird Surveys 2020 and their Recent Status within Yorkshire.

- 8.43 As the assemblage mostly comprised common and widespread species in numbers typical of the habitats present, the site was considered to be of no more than **Local Significance** for its breeding bird assemblage.

Bats

- 8.44 Based on results of transect surveys undertaken to date (spring and summer) and April and May static detector survey bat activity has been dominated by common pipistrelle bats and on transect surveys far lower levels of activity were recorded from noctule and soprano pipistrelle bats. While the dominance of common pipistrelle activity was also seen in the static data this was less marked and roughly 1/5 of activity was from myotis species (majority recorded at a central hedgerow in the core development area). Levels of activity indicated by both data sets are considered low to moderate and unremarkable for the time of year and habitat suitability. Very few registrations from brown long-eared, noctule, nyctalus and soprano pipistrelle bats were recorded in static data.

Evaluation Summary

- 8.45 The evaluation of the ecological features identified during the baseline survey work is summarised in Table 7.12 below. For the purpose of this chapter, all features assigned Local value or higher and / or afforded legislative protection were deemed to be IEFs and have been taken forward into the assessment of potential impacts as set out in the following section.

Ecological Feature	Value
Potter Holes Plantation LWS/LNR	County

Skier's Spring Wood LWS	County
Black Lane LWS	County
Semi-natural Broadleaved Woodland	Local
Broadleaved Trees	Local
Hedgerows (of moderately high to high value)	Local
Reptiles	Local
Winter Birds	Local
Breeding Birds	Local
Bats (foraging and commuting habitat)	Local

Table 7.12: Summary of Important Features

Identification of Likely Effects

- 8.46 This section considers the potential impact from construction and operation of the proposed development.
- 8.47 In the absence of mitigation or enhancement measures such as a green infrastructure (GI) strategy, potential moderate to substantial biodiversity and ecology effects arising from the proposals include:
- Degradation/disturbance to designated sites and other valued habitats resulting from light, noise, visual disturbance, air quality (dust deposition) and surface water runoff
 - Direct loss of habitats and associated flora and fauna within the site boundaries, interruption of wildlife corridors, decrease in value to wildlife through reduction in species and/or loss of habitat of notable wildlife value;
 - Disruption, fragmentation or loss of existing habitats of notable ecological value (e.g. hedgerows);
 - Construction phase or operational effects such as indirect or direct disturbance or direct mortality of protected and scarce species; adverse effects due to artificial lighting; water/air pollution and noise.

Construction Impacts

Locally Designation Sites

- 8.48 Black Lane LWS is located in proximity (50m) to the south of the development boundary where limited works proposed include the installation of an outflow pipe from proposed surface water attenuation infrastructure further north. At this location these limited works are buffered by existing woodland and there is further separation from Blackburn Valley railway line and hard-standing. In the absence of mitigation there is some potential for construction activities to affect

the LWS in the short term, including noise, dust deposition and risk of contaminants entering the site from the construction areas. If severe such impacts could result in changes to the composition of the hedgerow ground flora and/or death of shrub and canopy species that could affect the integrity of its LWS designation along this boundary.

- 8.49 Potter Holes Plantation LWS and Skier's Spring Wood LWS are unlikely to be affected by dust disposition, noise generated during the construction phase or other contamination due to their distance (over 500m) from the site.

Habitat Loss

- 8.50 It is understood that the site development will involve the following habitat losses:

- Loss of arable (39.61ha)
- loss of semi-improved (10.7ha) and improved grassland habitats (0.27ha)
- Loss of amenity grassland (1.17ha)
- loss of scattered scrub (0.73ha)
- loss of a plantation woodland (0.11ha)

- 8.51 Two mature pedunculate oak (T1 and T2), and ornamental trees groups associated with existing sports pitch will be lost to proposals (see Appendix K, section 7.1 for tree references).

- 8.52 Loss of approximately 1900km of hedgerow.

Habitat Disturbance

- 8.53 Construction operations have the potential to lead to disturbance effects on both the retained and adjacent semi-natural habitats. This may take the form of either:

- Physical damage to vegetation and soil compaction;
- Accidental pollution; or
- Dust deposition.

Effect on Fauna through Habitat Loss and Disturbance

Reptiles

- 8.54 Reptile suitable habitat at the periphery of the site will be largely retained, including where the single reptile was recorded. Some suitable habitat, including mature hedgerows will be lost and where peripheral habitats are retained there is a risk of dust deposition and other contaminants reducing the suitability of these habitats for reptiles in the short term.

- 8.55 Considering the large extent of adjacent more suitable reptile habitat that will be unaffected by development (Bell Ground (wood)) the loss of suitable on site reptile habitat is not considered likely to affect the conservation status of the low reptile population identified.

- 8.56 In the absence of mitigation there is a risk that the activities associated with construction could lead to the accidental killing or injury of reptiles. Mortality is considered likely to adversely impact on the local conservation status of grass snake.

Winter Birds

- 8.57 Sixteen notable bird species (listed on Schedule 1 of the W&CA, are a BoCC Red List species, or a species of principal importance) were recorded utilising the on site habitats during winter and are considered the most vulnerable to impacts. The majority were generalist species adaptable to a wide range of habitats and were noted using hedgerow, woodland and scrub habitats. Flocks of starling and redwing were noted using arable fields.
- 8.58 The species recorded are considered typical of the agricultural habitats present both in the development site and surrounding landscape and given the limited extent of the development site habitats to be lost represent a relatively small proportion of that available in the wider landscape.
- 8.59 Without mitigation the overall impact of long-term habitat loss to wintering birds is likely to be of moderate significant at the **Local scale**.

Breeding Birds

- 8.60 The 15 notable species (listed on Schedule 1 of the W&CA, are a BoCC Red List species, or a species of principal importance) recorded during breeding bird surveys are considered most vulnerable to impacts. Six were noted as confirmed breeders including yellowhammer, lapwing, starling and skylark. Hedgerows and scrub were the most densely occupied and the majority of breeding species were associated with these habitats.
- 8.61 Central field compartments provide some suitability for ground nesting species and low numbers of skylark and lapwing were recorded as breeding within the site. Habitat for ground nesting species will be completely lost to development and suitability for other breeders would be significantly reduced locally.
- 8.62 In the absence of mitigation, the overall impact of long-term habitat loss to breeding birds is likely to be of moderate significance at the **Local scale**.
- 8.63 There is potential for indirect impacts to breeding birds via disturbance where habitat clearance is undertaken in proximity to retained habitats during the bird nesting season. Birds will habituate to certain noises and levels, although some noises may cause them to fly and temporarily abandon nests, although they may return once the disturbance has passed. During the breeding season such disturbance may lead to reduced breeding success through nest desertion or the avoidance of otherwise suitable habitat. While of potentially major significance to individuals, impacts would be short-term and of Minor adverse significance at a **Local scale** on populations.

Bats

- 8.64 Levels of recorded bat activity were low to moderate and in the core development area where much of the habitat loss (hedgerows, scrub and field centres) is proposed. Bat activity encountered on transect survey was roughly evenly distributed over the different habitats. On southern transects where a higher proportion of more suitable bat habitat (woodland edge) was sampled, levels of activity were roughly the same.

- 8.65 The most frequently recorded bat species, common pipistrelle, accounted for 74% of activity from static surveys and accounted for a much greater proportion of transect activity. This species is considered less sensitive to artificial lighting. Activity from myotis species accounted for a relatively high proportion of static data from the core development area and this group of bats are generally considered more sensitive to artificial light.
- 8.66 Due to the relatively low levels of bat activity recorded and the presence of bat connective habitat around the development site area (outside the site) in the absence of mitigation the overall impact of long-term habitat loss and indirect impacts to retained habitat potentially resulting from artificial lighting is likely to be significant at the **Local** scale.

Significance of Identified Effects

- 8.67 The significance of an impact is a matter of professional judgement but can be described in general terms as being a product of the ecological or nature conservation value of a site / habitat / community / species (the receptor) and the magnitude of the predicted impact. As a general rule, the more ecologically valuable a site and the greater the magnitude of the impact, the higher the significance of impact is likely to be.

Ecological Features	Confidence	Effect	Magnitude
Potter Holes Plantation LWS/LNR	Extremely unlikely	Negligible	Negligible
Skier's Spring Wood LWS	Extremely unlikely	Negligible	Negligible
Black Lane LWS	Unlikely	Temporary short-term negative impact	Minor
Semi-natural Broadleaved Woodland	Probable	Long-term indirect impacts to a limited extent of woodland edge habitat	Minor
Broadleaved Trees	Certain	Permanent loss to a proportion of the onsite resource	Moderate
Hedgerows (of moderately high to high value)	Certain	Permanent negative direct and indirect impact	Major
Reptiles	Probable	Permanent direct and short term, indirect negative impacts on suitable habitat condition and extent	Moderate

Winter Birds	Certain	Permanent negative direct impacts	Moderate
Breeding Birds	Certain	Permanent negative direct and limited temporary short-term indirect impacts	Moderate
Bats (commuting and foraging)	Certain	Permanent negative direct and limited temporary short-term indirect impacts	Moderate

Table 7.13: Summary of Identified Effects

Cumulative Impacts

- 8.68 A single project is coming forward within the Hoyland West Masterplan area which potentially could contribute to a cumulative effect on the local biodiversity and wildlife resource in combination with this project.
- 8.69 Site HS57 Land at Tankersley Lane (3.2 ha.) is for the development of 101 dwellings including provision for a landscape buffer from the development site (ES13) provided within this application for ES13. In addition to the 101 dwellings future proposed development for HS57 land includes provision of 1.7ha of employment development and, also within the Hoyland West Masterplan area, a further 2.03ha of employment land is proposed north of Tankersley Lane.
- 8.70 The land incorporated within the Hoyland West Masterplan area (including the residential allocation and two employment plots above referenced) adjoins the development site and falls largely within the ecology survey area subject to detailed assessment. As detailed within the technical appendices (7.1-7.5) the land here is dominated by heavily cultivated arable habitat and amenity managed grassland and considered to be of limited ecological value.

Cumulative Impacts to Non-statutory Sites of Nature Conservation Interest

- 8.71 Due to the low level of impact resulting from the application site it is considered that there will be no cumulative impacts with other schemes upon any non-statutory sites of nature conservation interest during the demolition and construction phase.

Cumulative Impacts to Habitats

- 8.72 Due to the limited ecological value of land within the HS57 allocation that has been subject to detailed assessment along with the ES13 allocation land cumulative impacts resulting from habitat loss are considered to be negligible.

Cumulative Impacts to Fauna

- 8.73 Assessment of protected species suitability along with target faunal surveys of HS57 allocation land have been undertaken as part of the ES13 land ecology work and potential impacts have been addressed as part of this ES assessment such that cumulative impacts to protected species are likely to be negligible. The presence of bat roost potential buildings within the HS57

allocation land has been highlighted and targeted surveys form part of this ES assessment. Should a bat roost be recorded there is ample scope for mitigation within the ES13/HS57 projects.

Mitigation and Monitoring Measures

- 8.74 From the outset and following review of the ecological baseline the potential effects arising as a result of the proposed development have been reviewed in order that, where possible, potential impacts can be avoided through an alteration in design, layout or working methods.

General Construction Site Impact Avoidance Measures

- 8.75 The potential for impacts on retained habitats outside of the immediate working areas during construction activities would be minimised by retaining and protecting unaffected and/or boundary habitats within the site to ensure that disturbance is kept to a minimum and any sensitive species are retained in situ. This would primarily be achieved through the erection of protective fencing around the retained habitats during construction using best practice methods.
- 8.76 No temporary storage of materials, construction of haul routes, or site machinery would be situated within retained habitats. Access by construction site personnel would be restricted to proposed roads off Sheffield Road/Birdwell Roundabout and Tankersley Lane.
- 8.77 The relevant Guidelines for Pollution Prevention (GPP) listed below will be adhered to, to ensure construction works are undertaken in an environmentally responsible manner. Any environmentally hazardous material used will be kept in dedicated stores and storage tanks will have appropriate bunding. All construction activities will be undertaken in accordance with a Construction Environmental Management Plan (CEMP).
- GPP5: Works and maintenance in or near water for construction or maintenance works near, in or over water;
 - GPP8: Safe storage and disposal of used oils
 - GPP13: Vehicle washing and cleaning
 - GPP19: Vehicles: Servicing and repairs
 - GPP21: Pollution Incident Response Plans.

Mitigation for Non-statutory Sites of Nature Conservation Interest and retained habitats

- 8.78 No designated wildlife habitats are present adjacent proposed development areas and the nearest non-statutory designation, Black Lane LWS, is separated from the site by existing woodland and Blackburn Valley railway line.
- 8.79 Direct external lighting would be avoided on all retained habitats. Offsite (retained) woodland edge habitats in proximity to development plots will be buffered by a broad belt of new structural planting.
- 8.80 While lighting of the proposed link road is unavoidable to comply with safety and adoptable standards the proposed lighting scheme has had regard to guidance issued by the Bat

Conservation Trust and Institute of Lighting Professionals and this guidance has been followed as closely as reasonably practicable. Lighting associated with the link road and development plots will be buffered from retained boundary habitats by structural planting.

- 8.81 Within the development plots and where feasible, all lighting would be directional to avoid light spillage onto new structural planting. Lighting levels in these areas would be as low as possible and only used where necessary.
- 8.82 Drainage proposals have been designed to avoid more ecologically valuable habitats (woodland) wherever feasible. All construction access should avoid areas of retained habitats, specifically works on the attenuation basin in the south where access will be confined to the proposed drainage infrastructure route.

Compensation for Habitat Losses

- 8.83 The development will largely result in the loss of arable fields, improved and semi-improved grassland habitats and hedgerows, which are of local significance at most. The significance of the hedgerow habitat is both in terms of the loss of habitat itself, and its function in providing connectivity across the existing site.
- 8.84 Green infrastructure proposals have been designed to compensate for habitat loss, incorporate areas of existing nature conservation value and create new complementary habitat, notably new structural planting, new wetland and biodiverse grassland of greater botanical diversity than those lost to the Development.
- 8.85 The current site proposals will compensate for biodiversity loss across the site and ensure that the ecological functionality of the site is maintained and habitat creation provides a meaningful contribution to the Dearne Valley Green Heart Nature Improvement Area including suitability for focal species/habitat such as noctule bat, barn owl, grass snake and wild flowers.
- 8.86 Where mature trees are to be lost the deadwood will be retained within existing woodland or incorporated within new structural planting. Additional supplementary faunal enhancements will include a scheme of bat and bird boxes and features for sheltering and nesting invertebrates.
- 8.87 As indicated above, this will be achieved through habitat creation, which will focus on compensating for lost habitats and provide habitat for protected/notable species currently using the site or thought most likely to colonise it in future. Habitat creation and enhancement opportunities present within the GI framework are driven by a number of factors influencing the site including:
- Protecting surrounding habitats;
 - A requirement to compensate for loss of habitats and ensure that, as far as possible within the development boundary, there is no net loss in biodiversity value arising as a result of the development;
 - A desire to benefit the Barnsley Biodiversity Action Plan targets; and
 - The maintenance of habitat corridors around the site and incorporation of habitat links to surrounding habitats.
- 8.88 The proposals include the provision of an extensive GI Framework totalling approximately 18 hectares. The GI proposals can be roughly divided into the following elements:

- The enhancement of existing arable habitat with attenuation including open water and biodiverse grassland;
- The implementation of new structural planting comprising a significant number of native trees and shrubs and grassland associated with easement corridors which will include additional woodland/scrub edge habitat;
- Native scrub planting, native hedgerows and standard trees associated with the proposed link road; and
- Native scrub, hedgerow and wet grassland seeding associated with attenuation.

Habitat Creation

Wetland

- 8.89 The primary function of the surface water drainage system will be to control flows and reduce the potential for flooding and associated pollution caused by runoff. However, it is important that SUDS are considered holistically and that each element is recognised as part of a network of habitats and wildlife corridors.
- 8.90 A new waterbody will to be created as part of the development. It is the intention to provide a varied wetland resource including a proportion of permanent standing water and associated marginal area habitat / drawn-down zone subject to seasonal or temporary inundation as part of the SUDS.
- 8.91 Open water areas would be shaped to provide a range of bank angles and heights and planted with native marginal species adapted to a varying soil moisture. Gradients will vary from 15° - 25° from horizontal and will be enhanced by the excavation of small embayments. This will create differing conditions of light and temperature and will thus maximise and encourage the diversification of the flora and associated fauna. Water depth will ideally range from 50mm to 2000mm, ensuring that both warm shallows for the developing larvae of aquatic invertebrates and amphibia are created and that an area of unfrozen water is retained throughout the year. The shallowest areas will grade into an expanse of seasonally wet mud that may attract a further variety of invertebrates and plants, which will, in turn, attract other fauna including birds and small mammals.

Woodland and scrub

- 8.92 Extending around the site's perimeter with the proposed link road (north east) and woodland edge (south and west) and the various built development plots would be a framework of landscape corridors and open spaces. New woodland and woodland edge/scrub planting around much of the site's perimeter would connect to that already existing immediately beyond, providing increased connectivity for species reliant primarily on native species. The implementation of additional woodland edge habitat facing the retained woodland edge would provide dark corridors for use by nocturnal fauna and links with the existing surrounding woodland to aid the colonisation and dispersal of woodland species.
- 8.93 All woodland and woodland edge planting will be of native provenance and reflect the composition of semi-natural woodland locally including provision of high proportions of wych elm found in Bell Ground (wood) and essential for use by locally recorded white letter-hairstreak butterfly. Following initial establishment, woodland blocks will be monitored and managed to ensure they develop a varied structure over time, with associated scrub and canopy layers.

This will include the selective thinning of poorer quality species during establishment (while ensuring retention of wych elm).

Hedgerows

- 8.94 New hedgerows and scrub habitat would be created on the site's periphery with the proposed link road, which will provide a habitat corridor around this part of the site. Existing hedgerows where retained would be maintained and enhanced as they provide sheltered corridors for wildlife to move along; encouraging dispersal around the site. Hedgerows should be managed to promote a thick diverse structure to provide valuable habitats and corridors of movement.

Habitat Management

- 8.95 A Landscape and Ecological Management plan will be produced to provide detailed specifications for the creation of the new habitats described above and the management of all retained and created habitats to promote their biodiversity value in the long-term. The management plan will also include a comprehensive work schedule detailing the timings of all works required. A detailed management plan could be drawn up and be conditioned.

Mitigation for the Disturbance to Fauna

Reptiles

- 8.96 Grass snake recorded at the periphery of the site are a highly mobile species and so may be present in all suitable habitats with links to the south eastern boundary / Bell Ground (wood) where they were recorded including hedgerows, scrub, ditches and associated coarse vegetation. To minimise harm during site clearance these habitats should be removed in accordance with best practice detailed in Appendix K, section 7.2 and during the reptile active season (March to mid-October in suitable conditions). To avoid killing or injury of reptiles protected under the Wildlife and Countryside Act 1981 (as amended).

Birds

- 8.97 To avoid disturbance to breeding birds, vegetation clearance will be undertaken prior to the bird-breeding season (March to August/September) and where the same habitat is to be covered under reptile best practice above the vegetation would first be removed down to 200mm outside the bird nesting season (to remove suitability for nesting birds) and subsequently removal in accordance with reptile best practice. If this is not possible for some limited areas then vegetation will be checked prior to removal by an experienced ecologist. If active nests are found, vegetation will be left untouched 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 (as amended).
- 8.98 A scheme of bird boxes will be erected across the site. These will include:
- A mixture of small hole (26mm and 32mm) boxes will be placed along the retained habitat around the proposed development area and will provide nesting opportunities for blue tit and great tit. These boxes generally have a high uptake rate; and
 - Small open fronted nest boxes again will be placed throughout the site. These boxes typically attract robin and blackbird.

Bats

- 8.99 A sensitive lighting scheme including the avoidance of direct lighting of existing or proposed areas of potential bat habitat; directional low-level lighting, the avoidance of mercury/halide lamps and lighting only where necessary.
- 8.100 A scheme of bat boxes will be erected across the site to enhance the site for this species group.

Monitoring

- 8.101 The Landscape and Ecological Management Plan will provide details of monitoring for new and retained habitats to ensure appropriate habitat management continues to enhance the biodiversity value of the site. This will include regular monitoring of the habitats to confirm that management is achieving the targets that will be set out within the document and to alter management prescriptions where appropriate. The detailed work schedule will provide timescales for the monitoring of habitats.

Biodiversity Net Gain Assessment

- 8.102 The NPPF, since its overhaul in February 2019 requires developments to deliver 'no net loss' in biodiversity. Paragraph 174(b) states:

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

d) minimising impacts on and providing net gains for biodiversity....."

- 8.103 In compliance with this policy, a Biodiversity Impact Assessment (BIA) is being completed using an accepted and nationally recognised metric developed by Warwickshire County Council, to provide an open and objective assessment of biodiversity net gains and losses.
- 8.104 The whole development area is valued at 109.40 units for habitats and 18.54 units for linear features. Taking into account habitat retention, the proposed development leads to a loss of 107.24 units for habitats and 13.74 units for linear features.
- 8.105 The creation of new areas of high-quality habitat results in a delivery of 72.65 units, delivering a net loss in biodiversity of -34.59 units (for habitats).
- 8.106 The creation of new hedgerows results in the delivery of 15.61 units, providing a net gain in biodiversity of +1.87 units (for linear features).
- 8.107 In order to ensure that the benefits of the proposed habitat creation are maximised, a Biodiversity Management Plan will be secured by condition and detail the long-term management of the site necessary to secure these benefits.

Refer to Appendix K (section 7.6) for Biodiversity Impact Assessment calculation tables.

Summary

Residual Effects

- 8.108 The residual effects consider the effects after the incorporation of mitigation measures. In the context of ecological assessment, many of these measures are incorporated as an integral part

of the scheme design. This iterative process has resulted in the proposed development being designed and modified to take account of the surveys and assessments undertaken. This has enabled the extent and scale of the potential adverse effects to be continually appraised as part of the evolving masterplan and scheme design.

- 8.109 The design approaches adopted have included measures to avoid or reduce potentially significant adverse effects arising from the proposed development. Compensatory measures are also proposed where impacts, such as habitat loss, are unavoidable and, where this is proposed, compensatory habitat creation measures have sought to provide habitats that complement those located within and close to the site.
- 8.110 The residual impacts resulting from construction and operation of the site are detailed in Table 7.14.

Ecological Features	Effect	Magnitude	Mitigation	Residual Effect
Potter Holes Plantation LWS/LNR	Negligible	Negligible	n/a	Negligible
Skier's Spring Wood LWS	Negligible	Negligible	n/a	Negligible
Black Lane LWS	Temporary short-term negative impact	Minor	General construction site impact avoidance measures, lighting strategy	Negligible
Semi-natural Broadleaved Woodland	Long-term indirect impacts to a limited extent of woodland edge habitat	Minor	General construction site impact avoidance measures, lighting strategy, construction access restrictions. Creation of extensive native woodland and scrub as part of the green infrastructure proposals	Minor beneficial effect of local significance
Broadleaved Trees	Permanent loss to a proportion of the onsite resource	Moderate	New tree planting including standard trees and long-term management, retention of deadwood from removed trees within the site	Minor negative effects of local significance

Hedgerows (of moderately high to high value)	Permanent negative direct and indirect impact	Major	General construction site impact avoidance measures, lighting strategy, construction access restrictions, extensive habitat creation, management plan	Minor beneficial effect of local significance
Reptiles	Permanent direct and short term, indirect negative impacts on suitable habitat condition and extent	Moderate	General construction site impact avoidance measures and best practice habitat clearance, lighting strategy, drainage proposals, construction access restrictions, management plan	Minor beneficial effect of local significance
Winter Birds	Permanent negative direct impacts	Moderate	General construction site impact avoidance measures, lighting strategy, construction access restrictions, habitat creation, management plan	Minor negative effect on fauna of local significance
Breeding Birds	Permanent negative direct and limited temporary short-term indirect impacts	Moderate	General construction site impact avoidance measures and best practice habitat removal, lighting strategy, construction access restrictions, habitat creation, management plan	Minor negative effect on fauna of local significance
Bats (commuting and foraging)	Permanent negative direct and limited permanent	Moderate	General construction site impact avoidance measures, lighting strategy,	Minor negative effect on fauna of local significance

	indirect impacts		construction access restrictions, habitat creation, management plan	
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Table 7.14: Residual Effects Summary

9. Landscape and Visual Impact

Methodology and Assessment Criteria

- 9.1 This LVIA has been prepared based upon the Guidelines for Landscape and Visual Impact Assessment, third edition (GLVIA3), published by the Landscape Institute and the Institute of Environmental Management and Assessment, in 2013.
- 9.2 In summary, the GLVIA3 states:
- “Landscape and Visual impact assessment (LVIA), is a tool used to identify and assess the significance of and the effects of change resulting from development on both landscape as an environmental resource in its own right and on people’s views and visual amenity.”* (GLVIA3 paragraph 1.1.)
- 9.3 There are two components of LVIA:
- “Assessment of landscape effects; assessing effects on the landscape as a resource in its own right;
 - Assessment of visual effects: assessing effects on specific views and on the general visual amenity experienced by people.” (GLVIA3 paragraph 2.21.)
- 9.4 The components of this report include: baseline studies; description and details of the landscape proposals and mitigation measures to be adopted as part of the scheme; identification and description of likely effects arising from the proposed development; and an assessment of the significance of these effects.
- 9.5 In terms of baseline studies, the assessment provides an understanding of the landscape that may be affected, its constituent elements, character, condition and value. For the visual baseline this includes an understanding of the area in which the development may be visible, the people who may experience views, and the nature of views.

Assessment of Landscape Effects

- 9.6 GLVIA3 states that “An assessment of landscape effects deals with the effects of change and development on landscape as a resource” (GLVIA3 paragraph 5.1).
- 9.7 The baseline landscape is described by reference to existing published Landscape Character Assessments and by a description of the site and its context.
- 9.8 A range of landscape effects can arise through development. These can include:
- *Change or loss of elements, features, aesthetic or perceptual aspects that contribute to the character and distinctiveness of the landscape;*
 - *Addition of new elements that influence character and distinctiveness of the landscape;*
 - *Combined effects of these changes.*
- 9.9 The characteristics of the existing landscape resource are considered in respect of the susceptibility of the landscape resource to the change arising from this development. The value of the existing landscape is also considered.

- 9.10 Each effect on landscape receptors is assessed in terms of size or scale, the geographical extent of the area influenced and its duration and reversibility. In terms of size or scale of change, the judgement takes account of the extent of the existing landscape elements that will be lost or changed, and the degree to which the aesthetic or perceptual aspects or key characteristics of the landscape will be altered by removal or addition of new elements.
- 9.11 The level of effect is determined by considering the sensitivity of the landscape receptors and the magnitude of effect on the landscape. Final conclusions on the overall landscape effects are drawn from the assessment components described. This assessment describes the nature of the landscape effects, and whether these are adverse or beneficial, at the following stages of development; construction, completion (year 1) and longer term (year 15).
- 9.12 The criteria used in the assessment are set out in appendix L.

Assessment of Visual Effects

- 9.13 An assessment of visual effects deals with the effects of change and development on the views available to people and their visual amenity. This assessment describes the nature of the visual effects and, whether these are adverse or beneficial, at the following stages of development; construction, completion (year 1 winter) and longer term (year 15 summer).
- 9.14 The first stage in the assessment is to identify approximate visibility/ visibility mapping. This is done by either a computerised Zone of Theoretical Visibility (ZTV)¹¹, or by manual methods using map study and field evaluation. A series of viewpoints are included within the assessment that are representative of views towards the site from surrounding visual receptors. Other views of the site are included where it supports the description and understanding of the site's landscape and visual characteristics.
- 9.15 The views also typically represent what can be seen from a variety of distances from the development and different viewing experiences.
- 9.16 It is important to remember that visual receptors are all people. For each affected viewpoint the assessment considers both the susceptibility to change in views and the value attached to views.

“The visual receptors most susceptible to change are generally likely to include:

- *Residents at home;*
- *People, whether residents or visitors, who are engaged in outdoor recreation, including use of public rights of way, whose attention or interest is likely to be focused on the landscape or particular views;*
- *Visitors to heritage assets or to other attractions, where views of the surroundings are an important contributor to the experience;*
- *Communities where views contribute to the landscape setting enjoyed by residents in the area;*

¹¹ Zone of Theoretical Visibility (ZTV): A map usually digitally produced, showing areas of land within which, a development is theoretically visible. [GLVIA3]

- *Travellers on road, rail or other transport routes tend to fall into an intermediate category of moderate susceptibility to change. Where travel involves recognised scenic routes awareness of views is likely to be particularly high.” (GLVIA3 paragraph 6.33.)*
 - *“Visual receptors likely to be less sensitive to change include:*
 - *People engaged in outdoor sport or recreation which does not involve or depend upon appreciation of views of the landscape;*
 - *People at their place of work whose attention may be focused on their work or activity, not on their surroundings, and where the setting is not important to the quality of working life(although there may be on occasion be cases where views are an important contributor to the setting and to the quality of working life.” (GLVIA3 paragraph 6.34.)*
- 9.17 Each of the visual effects is evaluated in terms of its size or scale, the geographical extent of the area influenced and its duration or reversibility.
- 9.18 In terms of size or scale, the magnitude of visual effects takes account of:
- The scale of the change in the view with respect to the loss or addition of features in the view and changes in its composition, including proportion of the view occupied by the proposed development;
 - The degree of contrast or integration of any new features or changes in the landscape with the existing or remaining landscape elements and characteristics in terms of form, scale and mass, line height, colour and texture;
 - The nature of the view of the proposed development, in terms of the relative amount of time over which it will be experienced and whether views will be full, partial or glimpses. (GLVIA3 paragraph 6.39).
- 9.19 The geographical extent of the visual effect in each viewpoint is likely to reflect:
- The angle of view in relation to the main activity of the receptor;
 - The distance of the viewpoint from the proposed development;
 - The extent of the area over which the changes would be visible.
- 9.20 As with landscape effects, the duration of the effect could be short to long term or permanent and the same definitions apply. The criteria used in this assessment are set out in appendix L.

Overall Landscape and Visual Effects

- 9.21 The final conclusions on effects, whether adverse or beneficial, are drawn from the separate judgements on the sensitivity of the receptors and the magnitude of the effects. This overall judgement is formed from a reasoned professional overview of the individual judgements against the assessment criteria.
- 9.22 GLVIA3 notes, at paragraphs 5.56 and 6.44, that there are no hard and fast rules with regard to the level of effects, therefore the following descriptive thresholds have been used for this appraisal:
- **Major;**
 - **Moderate;**

- **Minor;**
- **Negligible.**

9.23 Where it is determined that the assessment falls between or encompasses two of the defined criteria terms, then the judgement may be described as, for example, Major/ Moderate or Moderate/ Minor. This indicates that the effect is assessed to lie between the respective definitions or to encompass aspects of both.

Judging Overall Significance

9.24 A judgement is reached, based on the assessment, as to whether an effect is significant or not. Those degrees of effects that are considered to be *significant* by the assessor for *this* LVIA are judged to be effects that are either Major or Major/ Moderate.

9.25 GLVIA3 Statement of Clarification 1/13 (2013)¹² notes that:

"Concerning 'significance', it is for the assessor to define what the assessor considers significant...Depending on the means of judgment and terminology (which should be explicitly set out), effects of varying degrees of change (or levels of change), may be derived. The assessor should then establish (and it is for the assessor to decide and explain) the degree or level of change that is considered to be significant." (GLVIA3 Statement of Clarification).

Significance of Landscape Effects

9.26 GLVIA3 states, at paragraph 5.56, that:

"There are no hard and fast rules about what makes a significant effect, and there cannot be a standard approach since circumstances vary with the location and context and with the type of proposal. At opposite ends of the spectrum it is reasonable to say that:

- *Major loss or irreversible negative effects, over an extensive area, on elements and/ or aesthetic and perceptual aspects that are key to the character of nationally valued landscapes are likely to be of the greatest significance;*
- *Reversible negative effects of short duration, over a restricted area, on elements and/ or aesthetic and perceptual aspects that contribute to but are not key characteristics of the character of landscapes of community value are likely to be of the least significance and may, depending on the circumstances, be judged as not significant;*
- *Where assessments of significance place landscape effects between these extremes, judgements must be made about whether or not they are significant, with full explanations of why these conclusions have been reached. "(GLVIA3 paragraph 5.56.)*

Significance of Visual Effects

9.27 GLVIA3 states, at paragraph 6.44, that:

"There are no hard and fast rules about what makes a significant effect, and there cannot be a standard approach since circumstances vary with the location and context and with the type of

¹² Landscape Institute and the Institute of Environmental Management (10th June 2013) **GLVIA3 Statement of Clarification 1/13**

proposal. In making a judgement about the significance of visual effects the following points should be noted:

- *Effects on people who are particularly sensitive to changes in views and visual amenity are more likely to be significant;*
- *Effects on people at recognised and important viewpoints or from recognised scenic routes are more likely to be significant;*

9.28 Large-scale changes which introduce new, non-characteristic or discordant or intrusive elements into the view are more likely to be significant than small changes or changes involving features already present within the view. "(GLVIA3 paragraph 6.44.)

Baseline Conditions

Landscape Character

National Character

9.29 National Character Area (NCA) profiles have been prepared by Natural England for the 159 NCA's defined across England. These NCA profiles include a description of the natural and cultural features that shape the landscape, how the landscape has changed over time, the current key drivers for ongoing change, and a broad analysis of each area's characteristics. Figure 8.3 at Appendix L illustrates the NCA's and other defined character areas within the context of the site

9.30 At this very broad landscape scale, the site lies within Natural England's National Character Area (NCA) 38 'Nottinghamshire, Derbyshire and Yorkshire Coalfield'. This NCA stretches in a relatively narrow strip from Stapleford, west of Nottingham, to the northern edge of Leeds and therefore covers a very extensive landscape tract. Under Key Characteristics the NCA description includes the following references;

- *'A low-lying landscape of rolling ridges with rounded sandstone escarpments and large rivers running through broad valleys, underlain by Pennine Coal Measures.*
- *Local variations in landscape character reflecting variations in underlying geology.*
- *Several major rivers flow through the rural and urban areas of the NCA, generally from west to east in broad valleys.*
- *A mixed pattern of built-up areas, industrial land, pockets of dereliction and farmed open country.*
- *Small, fragmented remnants of pre-industrial landscapes and more recent creation of semi-natural vegetation, including woodlands, river valley habitats and subsidence flashes, with field boundaries of clipped hedges or fences.*
- *Many areas affected by urban fringe pressures creating fragmented landscapes, some with a dilapidated character, separated by substantial stretches of intact agricultural land in both arable and pastoral use.*

- *A strong cultural identity arising from a history of coal mining, steel making and other heavy industry which resulted from the close relationship between underlying geology and resource availability, notably water power, iron ore and coal.*
- *Features of industrial heritage such as mills, goits, tips, old railway lines, canals and bridges are evident, along with former mining villages.*
- *Many large country houses and estates established by wealthy industrialists in the 18th and 19th centuries and ancient monuments create focal points and important recreational opportunities within the landscape, such as Bretton Hall, Wentworth, Woodhouse, Temple Newsam, Nostell Priory, Bolsover Castle and the ruins of Codnor Castle.*
- *Extensive urbanisation, such as in the major cities of Leeds and Sheffield, with terraced and back-to-back housing and grand 19th-century municipal buildings and churches at their centres, now surrounded by extensive housing and industrial development.*
- *Widespread influence of transport routes, including canals, roads and railways, with ribbon developments emphasising the urban influence in the landscape.*
- *An extensive network of multi-user trails on former railway lines and canal towpaths, such as the Trans Pennine Trail and the Ebor Way.*
- *Continuing development pressure including land renewal and regeneration projects, especially along river corridors and around towns.'*

9.31 The Statement of Environmental Opportunity SEO1 states:

“Restore and enhance existing areas and create new landscapes through the inclusion of woodland and networks of green infrastructure to raise overall quality of design and location of new developments. Regeneration and restoration of industrial sites should seek to create green infrastructure that links fragments of the natural environment, leading to a functioning network for wildlife and access and recreational amenities for people.”

9.32 NCA 37 – Yorkshire Southern Pennine Fringe landscape character area lies approx. 4km to the south-west of the site. It is a transitional landscape character area between NCA 38 'Nottinghamshire, Derbyshire and Yorkshire Coalfield' and NCA 51 'Dark Peak'. It is characterised as being: “dissected by steep-sided valleys, dropping from the high gritstone hills to lower land in the east, and thus creating an important backdrop to the many industrial towns and villages within and beyond the NCA.”. The eastern boundary of NCA 51 is also a boundary of the Peak District National Park, located approx. 8 km to the south-west from the site boundary.

Barnsley Borough Landscape Character Assessment (2016)

9.33 The Barnsley Borough Landscape Character Assessment has been undertaken at a Borough level. It subdivides the landscape into six Landscape Types representing the diversity of landscapes in the Borough:

- A. Unenclosed Moorland
- B. Upland River Valleys
- C. Lowland River Valleys

D. Settled Arable Slopes

E. Settled Wooded Farmland

F. Upland Farmland

- 9.34 The site is located within the Landscape Type E: 'Settled Wooded Farmland'. This landscape type is defined by:

"(...)gently rolling landform, settlement ranging from isolated houses and farmsteads to large towns, deciduous woodlands, substantial areas of intact agricultural land (mainly in arable use), fields bounded by hawthorn hedgerows and some stone walls, small water courses that are tributaries of the rivers Don, Dearne or Dove, and stone farmsteads that are either still used as farms, or have been converted to purely residential developments. Views are often open and distant from higher ground, and enclosed by landform in valleys. Some areas of Settled Wooded Farmland are intact open countryside, free from the effects of urban development. Other areas are surrounded by or on the edges of urban areas, and strongly influenced by the proximity of development. There is a great variety in the proportion of developed land to open countryside, and the character of settlements within this type."

- 9.35 This Landscape Character Type is further divided into four landscape character areas:

- E1 West Barnsley Settled Wooded Farmland
- E2 Barnsley Settled Wooded Farmland
- E3 Grimethorpe Settled Wooded Farmland
- E4 Hoyland Settled Wooded Farmland

- 9.36 The site falls within the E4 Hoyland Settled Wooded Farmland landscape character area. The key characteristics are:

- *"Rolling landform with slopes towards River Dove watershed and canal associated with Elsecar."*
- *Diverse range of land use, including residential, woodland, agriculture, industry, landscape renewal, communication and recreation.*
- *Presence of large settlements on broad valley sides up to higher ground strongly influences character of surrounding land.*
- *Smaller settlements are found in elevated locations, including Pilley, Birdwell and Blacker Hill.*
- *Strong urban influence with urban pressures, such as horse grazing in compartmentalised fields, litter and flytipping, tatty allotments and scrap heaps, evident throughout but concentrated on urban fringes.*
- *Mainly deciduous woodland blocks of various sizes, including ancient woodland and new plantations on reclaimed tips.*
- *Farmland is a mixture of arable and permanent pasture.*

- *Degraded and unmanaged field boundaries consist of fences, hedgerows and stone walls.*
- *Scattered farmsteads are found in areas of agricultural land between the settlements.*
- *Evidence of current and past industrial activity due to presence of industrial estates, many reclaimed spoil heaps and remains of bell pits at Tankersley Park.*
- *Recreational land use including Urban Greenspace between Hoyland and Jump, and two golf courses adjacent to major roads.*
- *Presence of major road corridors with associated noise and visual intrusion, and vacant land that indicates plans for future development.”*

9.37 This Landscape Character Area is characterised as quite urbanised and being able to accommodate further built development without adverse effects on its landscape character. Localised enclosure by woodland, depressions in landform and built development generally limits the visual impact on adjacent character areas. Therefore, the landscape sensitivity to further built development is judged as low and landscape capacity as medium.

Rotherham Landscape Character Assessment and Landscape Capacity Study (2010)

9.38 The Rotherham Metropolitan Borough Council prepared the Landscape Character Assessment and Landscape Capacity Study for the rural areas of Rotherham Borough in 2010.

9.39 The nearest Landscape Area to the site contained in the study is 1B – Wentworth Parkland Fringes Landscape Character Area. It is located just over 1km to the south, south-east and south-west of the site. The key characteristics include:

- *“Gently undulating agricultural landscape of dispersed farmsteads with large deciduous woodland blocks, planted for sporting and amenity purposes.”*
- *“Heavily influenced by the Wentworth Estate, including an 18th Century Registered Parkland designed by Humphry Repton and the architectural influences of John Carr of York (architect).”*
- *“Predominantly large-scale arable fields, with the exception of the Deer Park adjacent to Wentworth Woodhouse.”*
- *“Larger settlements outside of the Character Area appear as skyline features on the high ground/ridges.”*
- *“Despite an apparent visual absence of mining influence there has been a past mining influence within Wentworth Park. Mining shaped the area and 60-70% has been opencast or underground mined. Remnants of 3 former pitheads have been largely reinstated after opencasting.”*
- *“Stone buildings with blue slate roofs.”*
- *“Wentworth village, which predates the Victorian era, but limited other settlement within the Character Area.”*

Designations

9.40 The site itself is not subject to landscape designations such as National Park or Area of Outstanding Natural Beauty (AONB). The relevant designations within the study area are summarised below:

- Elsecar Conservation Area is located approx. 2.6km to the east of the site.
- The site lies approx. 8 km to the northeast of Peak District National Park.
- The site is enclosed by Green Belt on its western and southern boundary.

Topography

9.41 The following should be read in conjunction with Figure 8.5, Appendix L.

Context - Landform

9.42 The topography of the immediate site context is gently undulating, with landform rising to the northeast and north-west of the site to 170-180m AOD. Beyond the immediate context the landform falls to 65m AOD towards Harley Dyke and Elsecar Reservoir to the south-east, while to the south-west, beyond Chapeltown, it rises sharply to 317m AOD towards Wharncliffe Chase.

Site - Landform

9.43 The landform within the site gently slopes towards the south-east, with the lowest point at 120m AOD at the southern boundary, and the highest point at 150m AOD at the middle of the site and towards the north-eastern boundary.

Site and Immediate Context

9.44 An assessment of landscape character of the site and its immediate context has been carried out, providing a finer level of assessment than the published studies. The following should be read with reference to the Aerial Photograph shown in Figure 8.2, appendix L.

9.45 The site comprises a number of field parcels, including arable land and grazing pastureland, of varying size. The upper part of the site is intersected by Tankersley Lane, which runs in a west-east direction. A small section of the Rockingham sports field is also included within the site's boundary, north of Tankersley Lane.

9.46 The western boundary comprises M1 motorway, while the eastern boundary encompasses the A6135 Sheffield Road along its southern section. The northern boundary of the site lies adjacent to the Birdwell Roundabout and A61. Bell Ground woodland is located at the southern edge of the site.

9.47 Although the site is open, and comprises largely pastoral fields, the character could not be described as rural, as it is strongly influenced by the adjacent settlement edge, and detracting elements such as the M1 and electricity pylons.

Site Features

9.48 Site features include field boundary hedgerows and hedgerow trees of varied quality. A densely vegetated buffer runs along the western site boundary to M1 motorway.

- 9.49 Other features include high voltage power line crossing the site from west to east near the southern boundary, and a section of Rockingham Sports Ground.

Landscape Value

- 9.50 In terms of "landscape value" it is appropriate to examine the role of the site and its immediate context in terms of the range of local factors set out in the GLVIA3 (Box 5.1, page 84), and summarised in the methodology. This considers the landscape in terms of a range of factors as set out below. As a starting point, landscape designations have been considered.
- 9.51 Landscape Designations: The site and its wider landscape context are not subject to any national, local or other landscape designations. The immediate site context to the south and west lies within Barnsley Green Belt.
- 9.52 Landscape Quality (Condition): The site is located on the settlement edge and is influenced by adjacent uses such as Sheffield Road and M1 motorway. Majority of the site is managed as agricultural land in the form of arable fields and pastureland. Small areas of rough grassland and scrub are located to the west of the site along the M1. The vast majority of the site was previously used for opencast mining, and as a result the landscape has been significantly altered over the years. The introduction of the M1 and electricity pylons have further eroded the semi-rural characteristics of the site.
- 9.53 Scenic Quality: The gently undulating landform within the site allows long views to the west and less-so to the south, while the built-up settlement edge to the east restricts the views in this direction. The visually detracting features include overhead cables and adjacent Sheffield Road, magnified by the lack of hedgerows along the eastern boundary. There are no features of visual interest within the site itself and the site is unremarkable in this respect.
- 9.54 Rarity and Representativeness: The site is located within the Hoyland Settled Wooded Farmland within the Barnsley Borough Landscape Character Assessment and reflects key characteristics of this landscape character area, such as degraded field boundary walls and fences, adjacent woodland blocks or agricultural land. The site is typical of the edge of settlement location and does not feature any rare landscape features.
- 9.55 Conservation Interest: The site has limited conservation value, both in ecological and heritage terms. There are no historical assets within the site, with a number of listed buildings in the immediate context of the site to the north, west and south. These include Church of St Peter approx. 293m to the west, Tankersley Old Hall approx. 445m to the south-west and a stone bar farmhouse approx. 187m to the north.
- 9.56 Recreational Value: The site is in private ownership and, with the exception of a section of Barnsley Boundary Walk/ Tankersley CP 26 Footpath running along the southern boundary, it is not publicly accessible. There are a number of public footpaths, including a section of the Trans Pennine Trail, that provides public access to the wider area in the site's context.
- 9.57 Perceptual Aspects and Associations: The site is managed for agriculture and is relatively flat and open, therefore not 'wild'. Neither is the site tranquil due to disturbance from passing traffic along Sheffield Road and M1. The site is also not known to have any particular associations with any particular people e.g. artists or writers, or historic events that contribute to perceptions of the natural beauty of the area.
- 9.58 In conclusion and having appraised the above factors it is judged that the site and the immediate landscape is of Medium/Low landscape value.

Visual Baseline

- 9.59 A visual appraisal has been undertaken for the site. This has explored the nature of the existing visual amenity of the area and sought to establish the approximate visibility of the site from surrounding locations and receptors. A series of photo viewpoints have been selected which support this analysis. Locations of viewpoints were agreed with an external consultant, appointed by Barnsley Metropolitan Borough Council
- 9.60 Photographs have been taken to illustrate a view from a specific vantage point or to demonstrate a representative view for those receptors that are moving through the landscape, e.g. rights of way users. The photographs may demonstrate varying degrees of visibility and include both short- and long-range views. The initial photographs were taken on the 11th March 2020, based on those viewpoints agreed with the Council. Further to a request from the Council for further viewpoints to be considered, photographs from viewpoints 15-19 were taken on 23rd June 2020. Seasonal differences have been taken into account when determining the visual effects on these receptors.

Photo Viewpoints

- 9.61 An assessment of the likely visual effects of the proposed development upon surrounding receptors is detailed in the subsequent section. Figure 8.6 and 8.7 in appendix L identify the location of the photo viewpoints and Figures 8.9-8.20 (appendix L) illustrate the photo viewpoints. They are briefly described below.

Viewpoint 1: View north west from Footpath (Tankersley CP 26)

- 9.62 The photo viewpoint represents the view experienced by users of Tankersley CP 26 public footpath and looks north-west towards across the site. The footpath runs along the southern boundary of the site and extensive views across the south of the site can be seen from this point. To the west, Bell Ground woodland defines the southwestern boundary of the site, with a line of trees and scrub vegetation flanking the western boundary along the M1. To the north, the landform rises gently, intersected by low-quality hedgerows and sparse hedgerow trees. A high voltage power line cuts through the site from west to east, with a number of pylons clearly visible. To the east, properties off Sheffield and Parkside Roads can be seen through hedgerows.

Viewpoint 2: View north west from Parkside Farm Shop car park

- 9.63 The photo viewpoint represents the views experienced by visitors to the Parkside Farm Shop car park. It looks north-west across a fenced paddock, with public footpath Tankersley CP 26 short distance away, running along the stone-walled southern site boundary. Shallow views are afforded to the southern extremity of the site, with gently rising topography, high voltage pylons and filed hedgerows in the distance. The topography prevents views into the central and northern parts of the site.

Viewpoint 3: View west from Stead Lane

- 9.64 The view looks west across an arable field and is representative of views experienced by users of Stead Lane. As Stead Lane slopes gently southwards, the view is partially screened by hedgerow vegetation. Properties off Parkside Road are visible to the north and a line of trees to the west indicates the location of A6135 Sheffield Road. A high voltage power line leads from

the north-west and continues south. The site is screened by a line of trees along Sheffield Road, while far in the distance a Wharnccliffe Chase can be glimpsed.

Viewpoint 4: View west from Sheffield Road A6135

- 9.65 The photo viewpoint shows the view looking west towards the site and is representative of views experienced by users of Sheffield Road and residents of properties along the road. Open views across the southern part of the site can be experienced from this location, with Parkside Farm Shop to the south and Bell Ground to the south-west, and a hedgerow bordering Sheffield Road Allotments to the north. A high voltage power line crosses the site from west to east, with a tall pylon constituting the main feature of the site from this point. Hidden by topography, the location of the M1 is only indicated by a line of trees at the western boundary of the site. Beyond, the Tankersley Park Golf Course and Wharnccliffe Chase can be seen in the distance.

Viewpoint 5: View west from Sheffield Road A6135

- 9.66 The viewpoint represents the views experienced by users of the A6135 Sheffield Road and residents of properties located along the road. The view looks west towards the site, across pastureland, with hedgerow bordering the nearby properties to the south, Green Lane Farm to the north-west and Shell petrol station and other properties to the north located along the Sheffield Road. A shallow view is afforded to the site, which is seen beyond the immediate field and Green Lane Farm. In the distance, a high voltage power line can be seen crossing the site from west to east, and a line of trees indicates the location of the M1 motorway to the west.

Viewpoint 6: View south from Tankersley Lane

- 9.67 The view is representative of views experienced by users of Tankersley Lane and it looks south towards the site. The view takes in several residential properties located along the southern edge of Tankersley Lane. These properties block any possible views of the site from Tankersley Lane; however, it is anticipated that views into the site would be experienced from rear first floor windows of these properties.

Viewpoint 7: View west from footpath (Tankersley CP 12) looking into the Rockingham centre

- 9.68 The photo viewpoint shows the existing view looking west towards Rockingham Centre and is representative of views experienced by users of the public footpath Tankersley CP 12. The view is seen through a boundary metal fence and trees and looks at the Rockingham Centre playing fields. The western edge of the centre is defined by hedgerow and mature trees. The site extends into the western part of the sports fields and is partially visible in this view.

Viewpoint 8: View south from A6195

- 9.69 The photo viewpoint is representative of the views experienced by users of the A6195 road looking south. Views across the very northern extremities of the site can be experienced. The extent of the site visible from this location is limited by rising topography. The view looks across the whole of the site north of Tankersley Lane. To the east, the Rockingham Centre building is visible, while to the south-east several roofs of the residential properties along Tankersley Lane can be seen in the distance, partially screened by a line of hedgerow and trees growing along the Lane. To the west of the site, A61 leads towards Tankersley Roundabout and further towards the M1 motorway.

Viewpoint 9A: View north from Tankersley Lane

- 9.70 This photo viewpoint shows the view looking north from Tankersley Lane, west of the Rockingham Centre, and represents the views experienced by users of Tankersley Lane. Shallow views are afforded into the immediate field, that forms a small part of the site. Mature hedgerow and trees along its eastern border with the Rockingham Centre. To the north, Rockingham Services buildings can be seen, with A61 joining the M1 motorway at Junction 36 to the west. Beyond the junction, residential properties in Tankersley can be seen, filtered by mature trees.

Viewpoint 9B: View south of Tankersley Lane

- 9.71 This photo viewpoint is representative of views experienced by the users of Tankersley Lane. Views can be experienced across the central section of the site, with a horse paddock in the foreground of the view, along with a number of small horse stables. To the east Green Lane Farm can be seen, partially screened by a hedgerow. To the west, a mature planting buffer of hedgerows and trees screens views of the M1 motorway. Directly south, beyond the paddock, the landform rises gently, with lines of hedgerows and sporadic hedgerow trees visible. A high voltage powerline with tall pylons crosses the site from west to east. The gentle rise in the landform prevents any views of the southern section of the site, beyond the line of pylons.

Viewpoint 10: View southeast from footpath (Tankersley CP 53) over M1

- 9.72 The photo viewpoint is taken from a footbridge over the M1 motorway and represents the views experienced by the footbridge users. The view looks southeast towards the M1 Junction 36. The view is seen through a tall metal rail and looks directly at the M1 below. To the east of the motorway, Tankersley Roundabout can be seen, with mature vegetation preventing any views of the site.

Viewpoint 11: View east from back of St Peter's Church, Tankersley

- 9.73 The view looks east from the back of St Peter's Church graveyard and is representative of the views experienced by the visitors to the graveyard. A foreground field on the west side of the M1 dominated the view, beyond which trees associated with the M1 largely screen the site from view. Only glimpses of the site can be seen through intervening vegetation. The view looks across a sloping field towards the site, which is partially screened by vegetation buffer growing along the M1 motorway. The residential settlement of Hoyland is seen beyond the trees to the east, as well as Tankersley Lane bridge to the northeast, with Rockingham Services beyond. A high voltage power line runs east towards the site, with a pylon visible to the south-east of the viewpoint.

Viewpoint 12: View east from Black Lane (Bridleway Tankersley CP 25)

- 9.74 The photo viewpoint is taken from Black Lane/bridleway Tankersley CP 25 and represents the views experienced by the users of the road/bridleway. The view looks east across an agricultural field, which rises gently towards east. The horizon is defined by treetops of planting along the M1, visible along the ridge. A high voltage power line cuts across the field towards south-east, with two tall pylons located within the field. The site is not visible from this point due to screening effects of rising topography.

Viewpoint 13: View east from Tankersley Park Golf Club (Footpath Tankersley CP 23)

- 9.75 The photo viewpoint is taken from the edge of Tankersley Park Golf Course public footpath Tankersley CP 23 and represents views experienced by users of the footpath Tankersley CP 23. Looking east, Tankersley Park Golf Course is partially visible, with trees and vegetation beyond. The site is not visible from this point, screened by dense vegetation.

Viewpoint 14: View north east from Tankersley Park Golf Club (Footpath Tankersley CP 33)

- 9.76 The viewpoint looks northeast towards the site and is taken from public footpath Tankersley CP33 within the Tankersley Park Golf Course. It represents the views experienced by the users of footpath and the golf course from this location. Fields bounded by hedgerows and hedgerow trees dominate the view. The central part of the site is partially visible, seen just beyond the M1, with Hoyland as a backdrop. The visible extent of the site takes up a small proportion of the overall view. Bell Ground woodland is visible in the right of the view. A high voltage power line crosses the view from north-west to the east, with several pylons seen in the distance.

Viewpoint 15: View north from Black Lane, in the vicinity of Tankersley Hall ruins

- 9.77 Tankersley Hall Ruins are visible in the left of the view, while a tall hedgerow on the east side of Black Lane limits visibility beyond. Bell Ground woodland forms the backdrop to the view, and screens the site (beyond) from view. The ruins are not publicly accessible, so only visible from adjacent Public Rights of Way.

Viewpoint 16: View northwest from A6135, at junction with Coach Road, Harley

- 9.78 This view represents the view experienced predominantly by road-users heading north. Residents of adjacent dwellings will experience a more restricted view, due to the filtering/screening effect of immediate vegetation. Intervening vegetation hides the site from view, however the pylons provide helpful visual clues as to where the site lies. Roofs of dwellings in Hoyland Common can be seen to the right of the site.

Viewpoint 17: View northwest from Barrow Hill, Wentworth

- 9.79 This viewpoint is located on the northern edge of Wentworth, just within the Conservation Area. A similar, more elevated view, can be experienced from Church Field Lane, however it is more obscured by immediate vegetation and buildings. From Barrow Hill, an open view can be experienced across foreground arable fields towards Hoyland and Hoyland Common, seen on the horizon. The southern extent of the site is partially visible just to the left of this settlement (light-green field), with Bell Ground woods immediately left from that.

Viewpoint 18: 2. View northwest from footpath leading northwest from Hooper Stand

- 9.80 Hooper Stand is a 30m tall, Grade 2* listed tower, on Lee Brook Lane, Hooper. No views towards the site can be experienced from the base of the tower, due to the screening effect of the immediately adjacent woodland. Photo Viewpoint 18 shows the view from the northern edge of this woodland, but the site is screened by intervening rising landform. The tower is usually open on Sunday afternoons, and visitors can experience wide, panoramic views from the viewing platform at the top of the tower. Desk study indicates that the site is visible from the top of the tower, although the significant distance between the viewpoint and the sight means the site would be difficult to pick out in the wider view. The site would be viewed in the context of Hoyland and Hoyland Common, seen just right of the site.

Viewpoint 19: 1. View northwest from Keppel's Colum, Kimberworth

- 9.81 Keppel's Column is a 35m tall, Grade 2* listed tower, accessed via Admirals Crescent (residential street) on the edge of Kimberworth. There is currently no public access inside the structure, however views towards the site can be experienced from the adjacent public footpath. From this location, a panoramic view can be experienced across the Wentworth estate. The site is visible in the left of the view, sandwiched between the immediate housing and the settlement area of Hoyland, seen on rising landform on the horizon. The visible extent of the site is small, when compared to the wider view.

Summary of Visual Baseline

- 9.82 The baseline analysis results in a number of reasoned conclusions which are summarised below:
- Due to the undulating topography of the site, only part of the site is visible from the majority of viewpoints.
 - The site is partially enclosed by Bell Ground woodland to the south, and the settlement edge of Hoyland to the east. Both these features prevent views into the site from further east and from the immediate south.
 - There is potential for open views into the site from sections of Sheffield Road and Tankersley Lane.
 - The site is partially visible from immediate footpaths, including footpaths 12 and 26, but visibility diminishes with distance from the site.
 - The undulating nature of the landform beyond the site, and the presence of woodland areas interrupt and limit views from the south-east and north.
 - The rising landform to the west allows filtered views of the site from more elevated positions.
 - Long-distant views of the site can be experienced from some elevated positions to the south.

Identification of Likely Effects

- 9.83 The following section outlines the likely landscape and visual effects that would arise from the proposed development on the site. Schedules detailing these likely landscape and visual effects for the receptors are included in appendix L references 8B and 8C respectively. Please refer to these in conjunction with the following descriptions.

Landscape Effects

Construction

- 9.84 All construction works would be carried out in accordance with best practice procedures to minimise effects on landscape character. Appropriate methods will be adopted to protect trees and vegetation during the construction phase based upon guidance contained within BS 5837.

- 9.85 There will be an initial disruption on the site's landscape during the construction phase, which will include the erection of site fencing and compounds and protective fencing for retained hedgerows and trees. Some vegetation will be removed to accommodate access and development and earthworks will be undertaken to create development platforms.
- 9.86 Construction effects are assessed and are negligible for the larger NCA and negligible/ minor adverse for the Barnsley Borough Settled Wooded Farmland Landscape Character Type due to the scale of these extensive areas, while for the Hoyland Settled Wooded Farmland Landscape Character Area as minor adverse.
- 9.87 Construction effects are however assessed as moderate adverse for the site and immediate context.

Operation (following Completion)

National Character Area

- 9.88 This is an extensive NCA which covers a large area which stretches from Nottinghamshire to North Yorkshire, including major urban areas such as Sheffield, Rotherham and Leeds.
- 9.89 The development reflects similar existing development in the area and will not result in a change to the key characteristics of the NCA. Landscape effects are assessed as negligible for the NCA at completion.

Barnsley Borough Landscape Character Type E: Settled Wooded Farmland

- 9.90 This character type covers the large central area of the Barnsley Borough Landscape Character Assessment, including Barnsley and Hoyland urban settlements.
- 9.91 At this broad geographic scale, the potential effects of the proposed development will be very limited and it will occupy a largely settled and developed position towards the edge of this LCT and within the same wider context as other comparable developments to the north east and south-west. The effects are therefore assessed as negligible/ minor adverse at completion and negligible at Year 15.

Barnsley Borough Landscape Character Area E4: Hoyland Settled Wooded Farmland

- 9.92 This landscape area covers the south-eastern part of the LCT, stretching from Tankersley to Wombwell. This LCA is quite urbanised and fragmented, with woodland blocks and agricultural fields intersected by major road corridors. The Barnsley Borough Landscape Character assessed the landscape character as moderate and landscape condition as poor, with the landscape sensitivity for further built development assessed as low and capacity as medium. Therefore, the landscape effects are judged as minor adverse at completion and minor adverse/negligible at Year 15.

Site and Immediate Context

- 9.93 The site lies within an urban fringe landscape which contains major road transport corridors, residential areas and older industrial development. Proposed industrial development will be located to the north and south-east of the site and will be similar in character to the development proposed within the site. Once completed, the site will change its character from open agricultural fields to a developed business park containing large scale industrial buildings, new road corridor, and associated green & blue infrastructure.

- 9.94 Due to the situation of the site close to the urban edge and major road corridors, as well as the site's industrial past, the landscape effects are deemed as moderate adverse at completion and moderate/minor adverse at Year 15.

Visual Effects

Zone of Theoretical Visibility (ZTV)

- 9.95 The ZTV (Figures 8.7 Appendix L) of the proposed development identifies areas from where views to any part of the proposed development are theoretically possible. The ZTV is not however, an indicator of the effect of the proposed development on the view but simply, its visible extent in the surrounding landscape.
- 9.96 A computer modelled ZTV for the proposed development was initially prepared based upon landform data and proposed building heights. This uses a 'bald earth' landform model that doesn't take into account the screening effect of features such as vegetation and buildings. As such, the extent of potential visibility is much wider than would actually be the case, once the screening effect of such features is factored in.
- 9.97 The ZTV of the proposed development is largely confined to the close context of the site, benefitting from screening effects of existing vegetation, landform and built development near the site. The visibility of the proposed development is likely to be greater to the south and south east, following the gentle slope of the landform; however, the long-range visibility from this direction is limited by mature woodland vegetation. Similarly, visibility of the site from west is limited to pockets of open land and areas in close proximity to the western boundary, with the mature woodland blocks limiting long range views of the proposed development. The site is also screened by the built form of Hoyland and Tankersley, with visibility limited to the receptors located close to the site.
- 9.98 There could be some limited locations (beyond the extent of the ZTV shown) that could have a potential distant or very limited view to a part of the development. Equally, there could be some locations shown within the ZTV that would not experience any views to the resultant development.
- 9.99 The following provides a summary of the visual effects assessment included at Appendix L, section 8C .

Photomontages

- 9.100 Photomontages (Figures 8.23-8.37 of Appendix L) have been prepared from five representative viewpoints to support the visual assessment. These have been prepared in accordance with the Technical Methodology set out in Appendix L, section 8D. The visual effects resulting from the development, as shown in these photomontages, is described in Appendix L section 8C, and summarised below.

Construction

- 9.101 All construction works will be carried out in accordance with best practice procedures to protect and to minimise, as far as practicable, adverse impacts on visual amenity.
- 9.102 During the construction phase, adverse effects upon the local visual resource will occur and this depends on the actual extent of visibility of the site for receptors. Inevitably, those visual receptors in closest proximity, e.g. residents of the Sheffield Road and Tankersley Lane, users

of the Sheffield Road and Tankersley Lane and Tankersley CP 12 and 26 public footpaths, will afford views of construction activity to include vehicles and associated machinery, site compounds, and earthworks/ground modelling.

- 9.103 Construction effects are judged to result in a high magnitude of visual change for local sensitive receptors, and the visual effects during construction would be major/moderate adverse for sensitive receptors in close proximity to the site, but moderate adverse to negligible for less sensitive receptors or those at a distance to the site.

Operation (following Completion)

Residents

- 9.104 Properties along Sheffield Road comprise mainly two-storey semi-detached and terraced houses, which overlook the eastern boundary of the site. The boundary offers only scarce screening in the form of residential and commercial buildings near the junction with Tankersley Lane. The residential properties south of Fitzwilliam Street will experience full views of the site, with proposed buildings of medium to large scale, most likely to be visible due to the proximity to the existing dwellings, as well as the scale of the proposed development. The proposed structural vegetation along the eastern boundary will help filter views of the proposed development as it matures, however, due to the large scale nature of the proposals, it is possible that the upper sections of the proposed buildings will be visible. Therefore, the effects are judged as major/moderate adverse at completion and moderate adverse at year 15.
- 9.105 Residents along the Tankersley Lane experience filtered views of the site from the upper rear windows. Due to the private nature of the dwellings, assessment of the actual views was not possible, however, it can be assumed that partial to full views of the proposed development may be possible. The proposed residential development will be located directly south, adjacent to the existing back gardens, and it is likely that the upper parts of the new dwellings may be visible. It is also possible that distant, filtered views of the Plot 1 building will be experienced. As the structural vegetation matures, it will provide further screening of the proposed development for this receptor. Therefore, the visual effects are deemed as major/moderate adverse at completion and moderate adverse at year 15.
- 9.106 Several residential properties are associated with the Parkside Farm and are set back from the Sheffield Road. A tall hedge lines the driveway, partially filtering views of the site. It is possible that partial views of the large employment units within Plot 2 will be obtainable from the upper side windows of the dwellings, with roof ridges of the proposed buildings likely to be seen. As the proposed boundary vegetation matures, it will filter views of the new development. Therefore, effects are deemed as major/moderate adverse at completion and moderate adverse at Year 15.
- 9.107 The Bell Ground House is located to the south of the site and is bordered to the north and west by Bell Ground wood. The woodland vegetation blocks majority of the views of the site for this receptor, with only the south eastern part of the site visible. The proposed boundary vegetation will provide further screening of views for this receptor, however, views of the upper section of the proposed buildings are likely. The effects are assessed as moderate adverse at completion and moderate/minor adverse at Year 15.
- 9.108 The views of the site experienced by residents of Parkside Road are limited to the closest dwellings to Sheffield Road. Partial views of the site are experienced from side windows and are filtered by roadside vegetation. Properties located further away from the site are likely to experience glimpse views of the proposed development, heavily filtered by the surrounding built

form and existing vegetation. Proposed structural vegetation within the site will further filter views as it matures. The effects are therefore assessed as moderate adverse at completion and moderate/minor adverse at Year 15.

- 9.109 The views of the site for residential properties along Fitzwilliam Street are heavily screened by the surrounding built form. Only glimpse views of the site are obtainable from the front windows of the properties closest to the site. With the Green Infrastructure vegetation maturing, the views will be further reduced. The effects are deemed as minor adverse at completion and minor adverse/negligible at Year 15.
- 9.110 The views of the site experienced from residential properties along Beaumont Street are heavily screened by the surrounding built form and small-scale commercial development to the west of Sheffield Road. Only glimpsed views of the site are obtainable from the front windows of the properties closest to the site. With the Green Infrastructure vegetation maturing, the views will be further reduced. The effects are deemed as minor adverse at completion and minor adverse/negligible at Year 15.
- 9.111 Wentworth is located some distance to the southeast the site, however there are opportunities for views of the proposed development from the north-western edge of the village, just inside the Conservation Area. From a small number of dwellings (approximately 6no.), residents will experience partial views of the south-facing elevations of the southern-most plots. The resultant effect on visual amenity is judged as minor adverse initially, reducing by Year 15 to minor adverse/ negligible, as proposed woodland planting helps to screen the built development.
- 9.112 No view of the built development will be available from the majority of residential receptors in Harley (south of the site), however glimpsed views of the southern elevations of a large distribution unit on Plot 2 may be experienced from up to 6 dwellings, on Coach Road and Lodge Drive. Views would primarily be secondary, experienced from first floor windows. Initial minor adverse effects on the visual amenity would reduce to minor adverse/ negligible, reduced by the screening effect of proposed woodland planting.

Users of Public Rights of Way (PRoW) and Other Footpaths

- 9.113 Users of the Tankersley CP 12 footpath experience glimpse views of the site looking across the Rockingham Centre. The view of the site is partially filtered by the existing boundary vegetation to the west of the Centre grounds. Full to partial views of the proposed development are likely from this location, as the proposed development will occupy a south western section of the sports grounds. As the structural vegetation along the new link road and adjacent to the new development matures, it will filter views from this location. Therefore, the visual effects are deemed as major/moderate adverse at Completion and moderate adverse at Year 15.
- 9.114 The users of public footpath Tankersley CP 26 experience wide views of the site, as they follow the footpath along the southern boundary of the site. A large extent of the site is visible from the footpath, as the landform rises to the north, obscuring views of the site close to Tankersley Lane. Bell Ground is visible to the west and residential dwellings off Sheffield Road to the north east. It is likely that initially full views of the proposed development will be experienced by the users of the footpath. As the proposed structural vegetation along the southern boundary matures, it will filter views of the development, limiting views to partial/ glimpse views over time. The effects are therefore deemed as major/moderate adverse at completion and moderate adverse at Year 15.
- 9.115 The views of the site experienced by users of the bridleway Tankersley CP 25 are largely obscured by the rising landform and existing vegetation along the M1 motorway. However, it is

possible that glimpse views of the proposed development are possible from other locations along this bridleway. Proposed structural vegetation within the site will further filter any possible views. Therefore, the effects are deemed as minor adverse/negligible at completion and negligible at Year 15.

- 9.116 The users of the public footpath Tankersley Nether UD 30 experience full views of the site from the junction with Sheffield Road. The link road and the proposed connection onto Sheffield Road will form dominant elements on the foreground, beyond which the built development on Plot 2 will be clearly visible. The building on Plot 1 will also be seen, set further back in the right of the view. Proposed structural vegetation will filter views in the long term, however, views of the upper sections of the proposed development are likely to be possible. As the users move further away from the site, the views become filtered by the existing vegetation along the footpath, eventually reducing the views to glimpses. The effects are assessed as moderate adverse at completion moderate/minor adverse and at Year 15.
- 9.117 Users of the footbridge over M1/ public footpath Tankersley CP 53 experience no views of the site at present due to the existing vegetation on the Tankersley Roundabout. It is possible that views of roof ridges of the proposed development will be obtainable from this location, filtered by the metal fence along the footbridge. Proposed structural vegetation will further reduce any potential views for this receptor. Therefore, the effects are assessed as negligible at completion and negligible/none at Year 15.
- 9.118 The views of the site for users of the public footpath Tankersley CP 23 are largely screened by the existing vegetation at various distances, however, possible glimpse views of the site are likely to be visible from other points along the footpath. As the proposed green infrastructure matures, it will filter further views of the site. The effects are deemed as negligible for completion and negligible/none at Year15.
- 9.119 The public footpath Tankersley CP 33 is located within the Tankersley Park Golf Course. The users of the footpath experience long-distance partial to glimpse views of the proposed development viewed against the urban settlement of Hoyland. The existing vegetation filters views of the site and will provide additional screening affect to the views of the proposed development. The proposed structural vegetation within the site will help to visually blend with the surrounding built form, however, the views of the proposed development will be obtainable. Therefore, the effects are assessed as moderate adverse at completion and moderate/minor adverse at Year 15.

Road Users

- 9.120 Sheffield Road runs along the eastern boundary of the site. Users of the road experience wide views of the site and its context, including Bell Ground to the south and Wharnccliffe Chase to the west. The proposed development within Plot 2 will be visible initially, with the buildings closer to the road being more prominent. Proposed development within Plot 1 will be seen in the distance through proposed structural vegetation along the link road. The road user travelling north will experience the views of the proposed development in the context of the urban settlement of Hoyland. Proposed structural landscaping will limit intervisibility between the road users and the proposed development, however, partial views of the new buildings will be possible for this receptor. Visibility will reduce over time as planting associated with the proposed development matures. The effects are assessed as moderate adverse at completion and moderate/minor adverse at Year 15.
- 9.121 Tankersley Lane crosses the site from east to west and divides it into two sections: southern and northern. The proposed built development will be clearly visible from this location, with

large employment units at Plot 1 and 3 replacing views of open fields. The buildings will be obvious and apparent elements in the view. Proposed structural vegetation along Tankersley Lane will provide some filtering of views as it matures. Therefore, the effects are deemed as moderate adverse on completion and moderate/minor adverse at Year 15.

- 9.122 The M1 motorway runs along the western boundary of the site. Opportunities for views of the proposed development from the M1 motorway are restricted by the rising landform of the site and its context. The motorway cuts through the adjacent landscape, creating high road verges planted with structural vegetation. This only allows partial to glimpse views of the tops of the proposed buildings within Plot 1, close to the southern boundary of the site. However, the speed of the traffic would prevent closer scrutiny of the views. Additionally, proposed structural vegetation along the motorway corridor will eventually reduce possible views of the development, with glimpsed views of the new development possible as the vegetation matures. The effects are deemed as minor adverse at completion and negligible at Year 15.
- 9.123 The users of the Tankersley Roundabout will experience full views of the proposed development within the northern section of the site. Already planted structural vegetation along the A6195 and the proposed vegetation to the north and north western boundary will filter some views of the new buildings, however, upper sections of the new development are likely to be visible and the proposed development will become a new feature of the site. The effects are assessed as moderate adverse at completion and moderate/minor adverse at Year 15.
- 9.124 Users of the Stead Lane will experience glimpse views of the proposed development, screened by the raising landform of the adjacent agricultural field and the roadside vegetation, with tops of the units within Plot 2 likely to be visible. The proposed structural vegetation along the link road will provide additional screening effects as it reaches maturity. Therefore, the visual effects are deemed as moderate adverse at completion and moderate/minor adverse at Year 15.

Other Visual Receptors

- 9.125 Visitors to the graveyard at St Peter's Church will experience partial views of the proposed development from the rear of the graveyard. The site is located to the east of the graveyard, beyond the M1 motorway. The proposed development will be partially visible, with views filtered by existing and proposed structural vegetation. Due to the scale of the development, it is likely that the upper sections of the new buildings will be visible from this location. The effects are deemed therefore as moderate/minor adverse at completion and minor adverse at Year 15.
- 9.126 Users of the Tankersley Park Golf Course experience varied views of the site due to screening effects of existing vegetation at different distances from the site. The southern section of the site can be seen in the distance from various points within the golf course. The proposed development will be partially visible to the users, with the proposed structural vegetation reducing potential views of the new buildings as it matures. The site is viewed against the Hoyland settlement and the new proposal will appear as an extension of the urban edge of Hoyland town. It can be assumed that the players' attention will be focused more on the game and less on the long-range views. Therefore, the effects are assessed as minor adverse at completion and minor adverse/negligible at Year 15.
- 9.127 The Parkside Farm Shop is located off the Sheffield Road to the south of the site. The visitors experience full views of the site from the shop car park. The new development will be seen in the distance, with the upper sections of the building likely to be visible above the proposed structural boundary vegetation. However, the vegetation will reduce the views from full to partial, as it matures. Effects for this receptor are deemed as moderate adverse at completion and moderate/minor adverse at Year 15.

- 9.128 Keppel's Column and Hooper Stand are both Grade 2* listed towers, located circa 5km southeast of the proposed built development. The effects on the visual amenity of visitors have been judged as minor adverse upon completion, reducing to minor adverse/ negligible by Year 15 by the screening effect of proposed woodland planting on the southern edge of the built development.
- 9.129 The ruins of Tankersley Manor are not publicly accessible but can be seen from Black Lane, in the vicinity of the proposed attenuation basin. The proposed built development will not be visible from this location, as Bell Ground woodland screens it from view.

Significance of Identified Effects

Landscape Effects

- 9.130 Appendix L, section 8B sets out the predicted landscape effects arising from the proposed development. The landscape effects of the overall proposed development will vary from negligible (for the broader NCA) to moderate adverse (for the effects at a site and immediate context scale) during construction of the proposed development. Upon completion of the proposed development, the landscape effects will vary from negligible (for the effect on the wider NCA) to moderate adverse (for the effect at a site and immediate context scale). The subsequent maturing of the landscape and planting proposals will aid the assimilation of the built development proposals within the localised landscape context.
- 9.131 The greatest level of effect will be experienced on the site landscape, however due to a number of factors, such as the much-altered landscape character and impact of the adjacent urbanising land uses, this has not been recorded as significant effect.

Visual Effects

- 9.132 Appendix L, section 8C sets out the visual effects arising from the proposed development. This has identified significant effects upon five visual receptors, as summarised below:
- Some residents on Sheffield Road will experience significant effects on visual amenity upon completion of the scheme. Proposed mitigation will reduce these below the threshold of being significant by Year 15.
 - Some residents of properties on the south side of Tankersley Lane will experience significant effects on visual amenity upon completion of the scheme. Proposed mitigation will help to reduce these by Year 15 to a point where they are no longer judged as significant.
 - Residents of Parkside Farm, to the south of Plot 2, will experience significant adverse effects upon visual amenity, but these will be reduced below what is deemed significant by Year 15, due to the mitigating effect of proposed planting.
 - Users of two public rights of way (footpaths CP 12 and CP 26) will initially experience significant adverse effects on visual amenity, but these effects will reduce below what is deemed as significant by Year 15, once the proposed structural planting has established, and can provide some degree of screening.

Cumulative Impacts

- 9.133 This section assesses the likely significant effects of the proposed development when considered in the context of other future projects within close proximity. The screening opinion

provided by BMBC confirmed that this should consider the cumulative impact of additional development at Hoyland West.

- 9.134 In addition to the development proposals put forward by this planning application, Hoyland West Masterplan Framework area also comprises a further 1.7ha of employment land and 2.53ha of land allocated for housing, with both these plots located between the proposed link road and Sheffield Road. The Council have also indicated their intention to bring forward another area of employment, which will form part of Hoyland West, but sits outside the Masterplan Framework Area indicated within the Local Plan – this further 2.03ha of employment lies north of Tankersley Lane, between the link road and Hoyland Common Primary School.

Landscape Effects

- 9.135 This future development area to the east of the application site shares the same landscape context as the project site in that they are both located within the NCA 38: Nottinghamshire, Derbyshire and Yorkshire Coalfield. They are also located within the same LCA E4: Hoyland Settled Wooded Farmland.
- 9.136 The landscape character is similar to the application site, although varying elements alter the character from south to north. The southern parcel allocated for employment comprises an irregular field with hedgerows, bounded by a dry stone wall on Sheffield Road. The area allocated for housing is currently dissected into a number of paddocks with some hedgerows, and a haulage depot accessed from Sheffield Road. This plot is strongly influenced by the settlement edge of Hoyland Common. The northern employment parcel would replace sports pitches, which although open, have a semi-urban character.
- 9.137 With all three development parcels built-out, there would inevitably be an additional element of change and effect on the local landscape character. The developments would, however, be perceived within the existing settlement edge context of existing highway infrastructure, residential development, school and commercial/employment developments located adjacent to the edge of the town.
- 9.138 It is assumed that the additional development proposals would be accompanied by a landscape strategy to minimise effects on the local landscape to include, for example, a strategy to retain existing landscape features of value and to include additional structural planting.
- 9.139 Although the development of all sites would create change in the local landscape, their existing character is described as being 'urban fringe' and in parts 'degraded', and certainly altered landscape character. The proposals would be well contained within the wider landscape by a combination of the existing settlement edge and the development proposed west of the link road, with impacts on landscape character restricted to a relatively localised area within the context of the settlement edge of Hoyland. Furthermore, GI strategies to include the provision of access to public open spaces and habitat creation across this landscape would provide long term environmental benefits.

Visual Effects

- 9.140 With regard to effects on visual receptors, the combination of two additional developments coming forward in conjunction with the proposed application would have some increase in effects on some key receptors, namely:
- Users of CP12 public footpath;

- Resident of Sheffield Road;
- Users of Sheffield Road, and;
- Residents of Tankersley Lane.

- 9.141 The development of the wider Hoyland West Masterplan Framework area would result in the built development being much closer to residents of Sheffield Road and Tankersley Lane. Although this closer development would appear much closer in the view than the employment development within the application site, the built development would be of a smaller scale, both in terms of height and massing. It would have the added benefit of providing screening to the larger industrial and distribution units west of the link road. Proposed structural planting will help the built development assimilate with its surroundings in time, however views across foreground fields and paddocks would be lost. The unsightly haulage depot would be replaced by a modern housing development, resulting in some benefits to visual amenity. Overall, it is anticipated that the added development may slightly increase the magnitude of impact on the visual amenity of these residents, due to the proximity of this development.
- 9.142 Users of Sheffield Road will experience an increase of visual effects by additional residential development to the east of the site, with employment and housing parcels abutting the west side of the road. Due to the narrowness of the housing site at this point, it is anticipated that built development would be set back from the road, so the impact of housing would largely be beneficial, as it would result in the removal of the unsightly haulage depot. The proposed employment buildings beside Sheffield Road are likely to be visible, enclosing the view to some degree. It is anticipated that these buildings will be a similar scale to the immediate context. Boundary vegetation would help filter views to buildings.
- 9.143 Development of Rockingham Sports Ground is likely to be glimpsed by users of Sheffield Road travelling south, and seen as part of the wider built context. As the view is transitory, and road users are largely focussed on the view ahead, rather than looking to the right, it is anticipated that the development of this plot would result in a negligible increase in visual amenity over-and-above that assessed for the application scheme, assuming that the buildings proposed are sensitively designed and in keeping with the setting.
- 9.144 Footpath CP 12 immediately abuts Rockingham Sports Ground, with a paladin fence. As such, views are fairly restricted. This footpath is within an urban setting, and visual amenity is heavily influenced by the adjacent urban elements. Should the sports pitches be developed for employment use, the built development would be much closer to the viewpoint than that proposed currently. As such, the magnitude of change would be greater. It is considered that a well-designed development could be accommodated here without causing unacceptable harm on the views.
- 9.145 Further cumulative effects would also be caused to additional receptors but to a lesser extent. Users of Tankersley Roundabout, north of the site and on the edge of Hoyland North Framework Masterplan, will experience a marginal increase of visual effects with both developments of Hoyland North and South visible from this location. However, in the context of existing industrial and commercial buildings and strategically located structural vegetation, the change will not be very noticeable to the users at this busy road junction.

Summary of Cumulative Effects

- 9.146 The value of the landscape affected by the additional development within the Hoyland West Masterplan Framework area is judged to be low, due to the presence of detracting elements,

(such as haulage yard), lack of valued landscape features, the altered nature of the landscape, and the urbanising influence of the adjacent settlement edge. As such, it has capacity to accommodate a well-designed development. Once the application area has been built-out, the remaining landscape area will be cut-off from the wider countryside, and would thus form a logical development site. Development would result in some loss of openness and loss of vegetation, such as small sections of hedgerow.

- 9.147 The proposed application development will screen the remaining Masterplan Framework area from visual receptors further west. As such, only viewpoints located between the application site and the western edge of Hoyland Common are likely to anticipate any noticeable change to visual amenity as a result of this future development. Once the remaining plots within the Masterplan Framework area are built out, it is anticipated that this foreground development would screen the application development from the majority of viewpoints.
- 9.148 It is assumed that any applications for the additional plots would be accompanied by a mitigation strategy to include good design and the provision of a GI strategy to consider landscape and visual effects for nearby receptors, with the retention of existing features and proposed boundary planting to screen and filter views and internal planting to soften the built areas.
- 9.149 In conclusion, it is not considered that cumulative effects will result in unacceptable long term significant adverse effects on landscape and visual receptors.

Mitigation and Monitoring Measures

- 9.150 The development proposals are shown on the parameters plans and described in the Design and Access Statement and other information accompanying the planning application. The existing landscape resource and the visual receptors and amenity of the site have been considered by the planning and design process and have informed the resultant scheme. This approach has entailed collaboration between landscape, urban design, ecological and other professionals. The landscape components of the scheme are an important integral part of the proposals.

Landscape Design and Green Infrastructure (GI) Objectives

- 9.151 The key objectives of the landscape and GI proposals for the scheme are to:
- Create cohesive Green Infrastructure, which links to existing footpaths, and provides a recreational resource for future residents and workforce.
 - Retain existing landscape features including; woodland, hedgerows and wetland whilst creating new habitats to maximise the opportunity for biodiversity.
 - Provide development in a sustainable location in close proximity to local shops and other existing facilities, and with good accessibility to public transport provision.
 - Reinforce the Green Belt boundary.
 - Integrate development into an existing settlement without detriment to the wider landscape character.
 - Help mitigate for visual impact resulting from the built development.

Landscape and GI Proposals

- 9.152 The proposed development and accompanying landscape and GI strategy have been carefully considered in the context of the published studies and this site-specific assessment. The proposals will include the creation of a broad landscape and green infrastructure area, stretching around the site's perimeter and providing a suitable robust landscape setting for the built development proposals. This landscape and green infrastructure area will extend to a minimum of approx. 20% of the total main site area.
- 9.153 The landscape GI and proposals for the scheme are outlined in the Design and Access Statement accompanying the planning application, with further detail provided in detailed landscape proposals. In summary, these proposals include:
- The provision of 10.2 hectares of land dedicated to landscape, GI, public open space, play and habitat-related proposals – representing approximately 20% of the total site area;
 - A mix of native woodland, trees, hedgerows and open grassland and wetland habitats extending around the built development area. This will include conserved mature trees and hedgerows and new native and ornamental planting.
 - A bund extending alongside the eastern side of the proposed spine road, planted with new structural vegetation to provide mitigation and visual screening to views from the south.
 - Sustainable drainage ponds designed for landscape, amenity and biodiversity benefits (in addition to satisfying drainage requirements).
 - Establishing connections between existing Public Right of Way (PRoW) and proposed footpath connections within the site.
- 9.154 In devising the landscape and GI proposals, there has been careful analysis of the development proposals and close collaboration with other environmental and technical professionals. This has sought to minimise potential adverse environmental effects and maximise opportunities for GI within the site areas. It has also sought to ensure that the landscape strategy proposals are both appropriate in the short and longer terms. Careful attention has also been paid to the emerging earthworks and drainage strategies to ensure that an integrated solution emerges that robustly addresses the landscape and visual issues associated with the proposals.

Landscape Management

- 9.155 All of the landscape areas and public open space features will be managed and maintained in the long term. It is anticipated that this would be achieved through the implementation of a comprehensive Landscape Management Plan (LMP) to be determined alongside other relevant site management objectives. The subsequent detailed and management works for the landscape and GI areas will be advanced in close collaboration with the relevant authorities and other technical environment professionals.

Summary

- 9.156 FPCR were appointed by Newlands Developments to carry out a Landscape and Visual Impact Assessment for the proposed development referred to as Land west of Sheffield Road, Hoyland. The site will incorporate a mix of employment buildings and facilities including offices, research, general industry, storage and distribution. A large proportion of Green Infrastructure will be included in the site, with retained vegetation where possible, proposed native woodland

blocks and hedgerows (including a 10m buffer to the M1 motorway), meadow and grassland areas and drainage features. The design of building elevations will consider how they will be viewed, with grey and blue cladding used where buildings are likely to be seen against the sky.

Landscape Character

- 9.157 The landscape character of the site and its context is varied and comprises a mix of uses and features, with medium-scale development and settlement to the north, urban settlement edge to the north and east, major road corridor to the immediate west and woodland vegetation to the south, with more agricultural fields further to the west, south and east.
- 9.158 The site and its immediate context include no designated landscapes, it does, however, border the Green Belt immediately to the west and south.
- 9.159 The site comprises a large area of farmland intersected by Tankersley Lane to the north, proposed for employment. Site features include field boundary hedgerows, stone boundary walls and high voltage power line. To the north, the site incorporates part of the Rockingham Centre sports fields and a small field parcel immediately adjacent to the Birdwell Roundabout. Located immediately to the north are Rockingham Services, currently being constructed. To the south lies Bell Ground woodland, one of several woodland blocks in the area, which, in conjunction with the rolling landform, visually interrupt the wider landscape context.
- 9.160 The settlement edge of Hoyland lies to the east and north of the site boundary, directly adjacent to Sheffield Road and Tankersley Lane. The site is therefore viewed in the context of the urban settlement edge.
- 9.161 The Landscape and Visual Impact Assessment (LVIA) has assessed the landscape value and sensitivity of the site and its immediate context in accordance with recognised guidelines (Guidelines for Landscape and Visual Assessment; 3rd Edition) and concludes that it is Medium/Low in both respects. This is also broadly supported by the published landscape character assessment that indicates relatively low landscape sensitivity to built development, with landscape capacity judged as medium.
- 9.162 Appendix L, section 8B sets out the predicted landscape effects arising from the proposed development. The effect of the development on the landscape character of the site and its immediate context has been judged to be moderate adverse upon completion, reducing to moderate/ minor adverse by Year 15. Although the magnitude of change is initially high, the sensitivity of the receptor is medium/low, and therefore the impact on landscape character is not judged to be significant.

Visual Amenity

- 9.163 The potential for views towards the proposed development varies across the surrounding landscape. There will be very limited opportunity to see the proposed development from receptors to the west and south-west. To the south, east and north views will be more prominent, with the highest parts of the proposed buildings visible even after the structural planting matures.
- 9.164 Appendix L section 8C sets out the visual effects arising from the proposed development. The most notable visual effects from the proposed development will arise from a number of properties off Sheffield Road and Tankersley Lane, from Parkside Farm and from stretches of the Tankersley CP 26 and 12 PRoWs, as well as from Sheffield Road and Tankersley Lane close to the site. From properties close to the eastern boundary and stretches of footpaths

along the southern and north eastern boundary there will be some initial major/moderate and moderate adverse effects during construction and/upon completion of the proposed development. These effects will however generally reduce over time as the landscape proposals establish and mature.

- 9.165 For those properties, PRoWs and roads located further away from the site boundary, to the west, north and east, the visual effects will be up to Moderate Adverse upon completion. Proposed structural vegetation along the site's boundary will provide additional visual screening towards the site buildings from these directions.
- 9.166 Opportunities for long-distance views of the site from the west, north and east are limited by the screening effects of existing vegetation, settlement edge, and undulating landform, reflecting the more restricted nature of the available views. Partial views to the proposed development are likely to be experienced from a limited number of receptors to the south and southeast, including views from Wentworth Conservation Area, and from two Grade 2* listed towers. Possible long-distance views will be further filtered as the proposed structural vegetation within the site matures.
- 9.167 This assessment has identified significant effects upon five visual receptors, as summarised below:
- Some residents on Sheffield Road will experience significant effects on visual amenity upon completion of the scheme (major/ moderate adverse). Proposed mitigation will reduce these below the threshold of being significant by Year 15 (**moderate adverse**).
 - Some residents of properties on the south side of Tankersley Lane will experience significant effects on visual amenity upon completion of the scheme (major/moderate adverse). Proposed mitigation will help to reduce these by Year 15 to a point where they are no longer judged as significant (**moderate adverse**).
 - Residents of Parkside Farm, to the south of Plot 2, will experience significant adverse effects upon visual amenity (major/moderate adverse), but these will be reduced below what is deemed significant by Year 15, due to the mitigating effect of proposed planting (**moderate adverse**).
 - Users of two public rights of way (footpaths CP 12 and CP 26) will initially experience significant adverse effects on visual amenity (major/ moderate adverse), but these effects will reduce below what is deemed as significant by Year 15 (**moderate adverse**), once the proposed structural planting has established, and can provide some degree of screening.

Conclusions

- 9.168 In summary, the proposed development will be most visible from more localised receptors close to the site boundary, with the receptors immediately to the east, south and north experiencing the greatest level of effects. Opportunities for views from receptors located further away from the site will be limited, due to the screening effects of existing vegetation, landform and existing built form. Where long-distance views of the development can be experienced, the visual impact will be limited by distance, with the development being seen in the context of the wider settlement.
- 9.169 Overall, the proposed development will result in some notable landscape and visual effects, yet these will be predominantly confined to the site and its immediate context and to a limited number of properties, PRoW and roads. The most notable landscape effects will arise from

direct changes to the landscape character of the site. Visually, the most notable effects will occur for a number of properties located close to the site and for users of a limited number of PProWs and roads within the immediate context of the site.

- 9.170 The overall scheme includes a robust landscape strategy that has been carefully devised to provide effective mitigation for the potential effects of the proposed development. Subsequent care and attention to the design treatment of the proposed buildings and to the detailed design, implementation proposals and subsequent management of the landscape and associated green infrastructure proposals will be important to ensure that the likely effects of the proposed development are further minimised wherever possible and the identified opportunities for landscape enhancement are maximised.

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